


(520) 258-7200

June 14, 2002

1610 (068)

Dear Reader:

The Bureau of Land Management (BLM) has prepared a proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (FEIS) for the public lands within the Las Cienegas National Conservation Area (NCA) and the Sonoita Valley Acquisition Planning District (APD). In the RMP/FEIS, the agency preferred alternative is Alternative 2 (the proposed action) which emphasizes ecosystem management and the use of partnerships and collaboration to achieve desired resource conditions. The preferred alternative is designed to achieve or maintain desired future conditions developed through the Sonoita Valley Planning Partnership process. Under the preferred alternative land use plan, the public lands are open to livestock grazing and dispersed recreation, both motorized and mechanized vehicles are limited to designated routes, and recreation is managed within three zones. Two utility corridors are established and the public lands are closed to mineral entry and location. The public lands in the planning area are designated as an Area of Critical Environmental Concern (ACEC). The preferred alternative includes a series of actions to meet the desired resource conditions for upland and riparian vegetation, wildlife habitats, and cultural and visual resources as well as livestock grazing and recreation management actions. The enclosed RMP/FEIS encompasses the draft EIS with appropriate corrections, additional information, and Draft RMP/DEIS comments with agency responses.

Changes made to the RMP/EIS since the draft publication are identified by a highlight  or strikeout (~~strikeout~~). These markings indicate updated, corrected, or additional information. A new chapter has been added, Chapter 6, which documents the comments received on the Draft EIS and BLM's responses.

The planning process offers an opportunity for administrative review by filing a protest with the BLM Director. In accordance with 43 CFR 1610.5-2, any person who participated in the planning process and believes they will be adversely affected by this plan may protest the proposed document. The protest may raise only those issues which were submitted for the record during the planning process. The **protest** must be **received** in writing at the address below by close of business **no later than 30 days** after the Notice of Availability is published in the Federal Register, anticipated for June 14, 2002.

**Protest letters must be sent to:**

Director, Bureau of Land Management (WO-210, MS 1075LS),  
Attention: Brenda Hudgens-Williams, Protest Coordinator,  
1620 L Street NW.  
Washington, DC, 20236.

At a minimum, protest letters must include:

1. The name, mailing address, telephone number, and interest of the person filing the protest.
2. A **statement** of the issue or issues being protested.
3. A **statement** of the part or parts of the proposed plan being protested. To the extent possible, this should be done by reference to specific pages, paragraphs, sections, tables, maps, etc., included in the document.
4. A copy of all documents addressing the issue or issues that you submitted during the planning process or a reference to the date the issue or issues were addressed by you for the record.
5. A concise **statement** explaining why you believe the proposed plan is wrong. All relevant facts need to be included in the statement of reasons. These facts, reasons, and documentation are very important to understand the protest rather than merely expressing disagreement with the proposed decision.

Please call Karen Simms, Community Planner, at (520 258-7210), if you have any questions on the RMP/FEIS. We appreciate your interest and encourage your continued involvement in the planning process.

Sincerely,

Shela A. McFarlin  
Field Manager

Enclosures

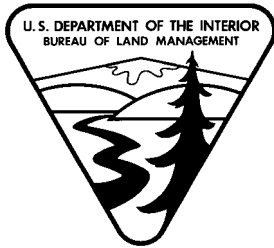
1 - Final Environmental  
Impact Statement



U.S. Department of the Interior  
Bureau of Land Management  
Arizona State Office

Tucson Field Office

June 2002



# Proposed Las Cienegas Resource Management Plan and Final Environmental Impact Statement



The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield; a combination of uses that take into account the long term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness and natural, scenic, scientific, and cultural values.

BLM/AZ/PL-02/004

# Proposed Las Cienegas Resource Management Plan and Final Environmental Impact Statement

Prepared by

U.S. Department of the Interior  
Bureau of Land Management  
Tucson Field Office  
Arizona

June 2002

RECOMMENDED:

APPROVED:



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Shela McFarlin  
Field Manager, Tucson Field Office

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Denise P. Meridith  
State Director, Arizona

This Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (FEIS) describes and analyzes four alternatives for managing the public lands and resources within the Las Cienegas National Conservation Area (NCA) and the Sonoita Valley Acquisition Planning District.

For further information contact Karen Simms, Ecosystem Planner, Tucson Field Office, Bureau of Land Management, 12661 E. Broadway, Tucson, Arizona 85748 or call (520)258-7200.

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# SUMMARY

## INTRODUCTION

The proposed Las Cienegas Resource Management Plan is a complete plan for managing the 49,000 acres of public land, resources, and uses within the Las Cienegas National Conservation Area (NCA) and Sonoita Valley Acquisition Planning District (See Chapter 1, Map 1-1). This plan differs from traditional BLM plans in two important ways. It was developed through a collaborative public planning process, and it is designed to use principles of adaptive management.

Through this document we are making land use plan decisions, including desired resource conditions, land use allocations, special designations, and land tenure decisions for the Las Cienegas National Conservation Area and public lands within the Sonoita Valley Acquisition Planning District. The management actions in this plan include many of the actions traditionally found in the following documents:

- Watershed management plans
- Wildlife habitat management plans
- Cultural resource management plans
- Allotment management plans
- Recreation management plans

The plan is also integrated with a ~~draft~~ **final** environmental impact statement (**FEIS**) that describes the potential environmental impacts of the proposed Las Cienegas Resource Management Plan. We have prepared this Resource Management Plan and **FEIS** according to the requirements of the Federal Land Policy and Management Act (FLPMA) and the National Environmental Policy Act (NEPA).

## PURPOSE AND NEED

The Las Cienegas NCA was designated by Congress in December 2000 in order to conserve, protect, and enhance the unique and nationally important aquatic, wildlife, vegetative, archaeological, paleontological, scientific, cave, cultural, historical, recreational, educational, scenic, rangeland and riparian resources and values of the public lands within the NCA. The act establishing the Las Cienegas NCA directed BLM to prepare a comprehensive management plan for the long-term management of the public lands within the NCA within two years of designation.

The Las Cienegas Resource Management Plan/Environmental Impact Statement has been prepared to guide and implement management for the public lands within the Las Cienegas NCA and Sonoita Valley Acquisition Planning District to ensure that these resources and values are protected and to resolve issues associated with management of the public lands within these areas. The issues and the planning process are described in more detail later in this Chapter. Chapter 5 provides additional details on the planning process and public input. As specified in the act, the Draft Las Cienegas Resource Management Plan was prepared from a draft of the Empire-Cienega Management Plan, which was in preparation when the NCA was designated, and in accord with the resource goals and objectives developed through the Sonoita Valley Planning Partnership process.

## CHANGES TO THE DRAFT

Changes made to the RMP/EIS since the draft publication are identified by a highlight (**highlight**) or ~~strikeout~~ (~~strikeout~~) for the convenience of the reader. These markings

*Summary: Planning Area-Planning Issues*

indicate updated, corrected, or additional information. A new chapter has been added, Chapter 6, which documents the comments received on the Draft EIS and BLM's responses.

## **THE PLANNING AREA**

The Empire-Cienega Planning Area encompasses 266 mi<sup>2</sup> (170,558 acres) in southeast Arizona, roughly bounded by Interstate 10 on the north, Arizona State Highway 83 on the west, the Whetstone Mountains on the east, and the Audubon Society's Appleton-Whittell Research Ranch on the south (See Chapter 1, Map 1-2). The Planning Area includes both the Las Cienegas NCA and Sonoita Valley Acquisition Planning District.

Together, the Las Cienegas NCA and Sonoita Valley Acquisition Planning District encompass much of the upper Cienega Creek watershed, which is important to Tucson for flood control and aquifer recharge. The area also has the following attributes:

- Five of the rarest habitat types in the American Southwest: cienegas, cottonwood-willow riparian areas, sacaton grasslands, mesquite bosques, and semidesert grasslands.
- Habitat for several endangered species.
- A site on the National Register of Historic Places.
- Two proposed wild and scenic river segments.
- Scenic open space.

## **THE PLANNING PROCESS**

We prepared this plan using several of the outcomes of the Sonoita Valley Planning Partnership (SVPP). The SVPP is a voluntary association of federal, state, and local agencies, organizations, and private citizens who share a common interest in the resources and management of the public lands within the Sonoita Valley, an area that includes the entire upper watershed of Cienega Creek. Chapter 1 describes in more detail the SVPP collaborative planning process and its outcomes.

## **PLANNING ISSUES**

Twelve major planning issues were generated for the Empire-Cienega Planning Area from initial public scoping, the collaborative planning process, and BLM interdisciplinary team members. These issues can be grouped into three categories relating to (1) desired future conditions, (2) land use allocations, and (3) special designation areas. Additional implementation issues were also generated under each of these broad categories.

## **DESIRED RESOURCE CONDITION ISSUES**

- Issue 1: Upland Area Management
- Issue 2: Riparian Area Management
- Issue 3: Fish and Wildlife Management
- Issue 4: Visual Resource Management
- Issue 5: Cultural Resource Management
- Issue 6: Maintenance of Desired Economic and Quality-of-Life Conditions

## *Management Guidance-Alternatives Considered*

### **LAND USE ALLOCATION ISSUES**

- Issue 7: Development of Salable, Locatable, and Leasable Minerals
- Issue 8: Designation of Utility Corridors
- Issue 9: Off-Highway Vehicle Designation
- Issue 10: Designation of Recreation Zones
- Issue 11: Livestock Grazing

### **ISSUES RELATING TO SPECIAL DESIGNATIONS OF PUBLIC LANDS**

- Issue 12: Designation of Areas of Critical Environmental Concern

### **MANAGEMENT GUIDANCE**

Regardless of the alternative chosen, BLM's management of public lands and resources is governed by many laws, regulations, and policies. Although not all of these can be summarized in this document, Table 2-1 summarizes the major laws, regulations, and policies that apply to the resources and proposals being analyzed in this RMP/FEIS. Appendix 2 describes the major resource programs and management guidance in more detail.

### **PROPOSED ACTIONS**

**Actions proposed in this document will apply only to public lands administered by the Bureau of Land Management.**

### **DESIRED FUTURE CONDITIONS**

The SVPP developed a vision, goals, and resource objectives for the Sonoita Valley area

(roughly the upper Cienega Creek basin and small portions of the upper Babocomari and Sonoita Creek basins) to be incorporated into planning efforts for the valley. As a participant in the planning partnership, BLM has incorporated the vision, goals, and objectives as the foundation for the Las Cienegas Resource Management Plan. Each action alternative is designed to achieve or maintain these future conditions by meeting resource objectives.

### **ALTERNATIVES CONSIDERED**

**We have separated the descriptions of the alternatives into two parts in the RMP/FEIS. Part A describes the desired resource conditions, land use allocations, special designations, and land tenure decisions which are part of each land use plan alternative. Part B describes the resource management actions which would be implemented under each alternative.**

#### **LAND USE PLAN ALTERNATIVES**

##### **Alternative 1 (No Action) (Current Management)**

Alternative 1, the No Action Alternative, would continue current management. Current management has been ongoing under the interim management guidance for the Empire-Cienega Planning Area included in the Phoenix Resource Management Plan (BLM 1988) and the interim grazing plan (BLM 1995). The management goal for the area as stated in the interim management guidance is to "preserve, protect, and enhance the property's multiple use values. These values include an extensive riparian area, presence of an endangered species, outstanding small and big game habitat, magnificent open space, and potential for dispersed recreation activities such as hiking, horseback riding, camping, and picnicking." Under current



### *Summary: Alternatives Considered*

management, desired resource conditions include an emphasis on federally listed threatened and endangered fish and wildlife and significant cultural properties. Land use allocations are limited to continuing the existing livestock grazing leases and continued closure to mineral exploration and development of lands acquired before the enactment of the Federal Land Exchange Facilitation Act of 1988. Alternative 1 would not designate utility corridors, ACECs, recreation zones, or an Arizona Trail corridor. As the baseline against which other alternatives are compared, Alternative 1 is required by the National Environmental Policy Act (NEPA).

#### **The Action Alternatives (Alternatives 2, 3, and 4)**

The three action alternatives differ from current management in several ways. Under all three, desired resource conditions would include maintaining or achieving goals and objectives for the planning area developed by the Sonoita Valley Planning Partnership. Management under all three alternatives would emphasize the following:

- Conservation of four rare vegetation communities and 18 associated priority species.
- Retention of the scenic values of the landscape.
- Preservation, adaptive restoration, or scientific investigation of significant cultural properties.

The action alternatives propose differing land use allocations for mining, utility corridors, recreation zones, corridors for the Arizona Trail, and grazing. Each alternative would make special designations for areas of critical environmental concern (ACECs). Each

alternative would implement the Las Cienegas Acquisition Strategy.

#### **Alternative 2 (Agency Preferred)**

Alternative 2 emphasizes ecosystem management and the use of partnerships and collaboration during implementation to achieve desired resource conditions. Biannually, a Biological Planning Team would collaboratively evaluate monitoring data and issues relating to livestock grazing, recreation, and wildlife management for the primary goal of maintaining or achieving desired resource conditions. BLM would designate all public lands within the planning area as an area of critical environmental concern (ACEC) to protect sensitive riparian and wetland habitats. Livestock grazing would continue on public land allotments, but grazing operations would incorporate variable stocking rates and flexible rotations. BLM would designate two utility corridors and a corridor for the Arizona Trail and would close or restrict the use of some roads to provide a mix of motorized and non-motorized recreation while ensuring that desired resource conditions are met. Both mechanized and motorized vehicles would be restricted to designated routes. *This alternative is also preferred by participants in the Sonoita Valley Planning Partnership.*

#### **Alternative 3**

Alternative 3 proposes the greatest mix of land uses with restrictions to protect sensitive areas. It would designate two ACECs to protect sensitive riparian and wetland habitats. Livestock grazing would continue on public land allotments, but current livestock grazing operations would be modified by reducing livestock numbers to conservative fixed stocking rates and establishing structured pasture rotations rather than variable stocking rates, seasonal use, and flexible rotations. BLM would designate three utility corridors and a

## *Summary: Management Actions - Environmental Consequences*

corridor for the Arizona Trail. Alternative 3 proposes fewer road closures and restrictions than do Alternatives 2 and 4 with emphasis on a mix of motorized and non-motorized recreation opportunities. Alternative 3 would also limit camping to designated sites on the most acreage.

### **Alternative 4**

Emphasizing land use closures and restrictions and limits on development as the approach to achieving desired resource conditions. Alternative 4 is the most restrictive of the alternatives. It would provide for the following:

- Public lands would remain closed to mining and would be closed to livestock grazing.
- All public lands would be designated as an area of critical environmental concern.
- A single utility corridor would be designated for major utility lines.
- The Arizona Trail corridor would use the existing road system and require shared use of motorized and non-motorized travel.
- More roads would be closed or restricted than under any other alternative.
- Both mechanized and motorized vehicles would be restricted to designated routes.
- Recreation developments would be limited to the smallest area.
- More area would be designated as recreation Zone 3—open to dispersed recreation with fewer restrictions—than under any other alternative.

## **MANAGEMENT ACTIONS**

There are four alternative sets of resource management actions which would be implemented under each alternative. The management actions for Alternative 1 are limited to management actions included in the existing interim grazing plan and project-by-project considerations for other resource programs, including cultural resources, wildlife, and recreation. The management actions for Alternatives 2, 3, and 4 include a common series of actions to meet the desired resource conditions for upland and riparian vegetation, wildlife habitats, visual and cultural resources. The management actions for Alternatives 2, 3, and 4 vary mainly by the alternative proposals for implementing livestock grazing decisions and recreation management.

## **ENVIRONMENTAL CONSEQUENCES**

Table 2-32 in Chapter 2 of this document summarizes the potential environmental impacts of the four alternatives. Detailed descriptions of impacts of the four alternatives are provided in Chapter 4. The impacts depict the projected changes that would occur to the environment if the alternative was implemented.

Chapter 4 also provides a description of cumulative impacts, irretrievable and irreversible commitments of resources, and unavoidable adverse impacts of the alternatives. The cumulative impact analyses address the degree and extent of the cumulative impacts on the environment. Cumulative impacts include the impact on the environment of incremental changes from various actions when added to other past, present, and reasonably foreseeable changes. Cumulative impacts can also result from individually minor, but collectively significant, actions.

## **CONSULTATION AND COORDINATION**

Chapter 5 provides information on public involvement in the planning process. Also included is a summary of BLM's coordination with state and federal agencies. Chapter 6

documents the comments received on the Draft EIS and BLM's responses.

# CHAPTER 1

## PURPOSE AND NEED



Cienega Creek flows year round through the National Conservation Area.

# CHAPTER 1

## PURPOSE AND NEED

### INTRODUCTION

The Proposed Las Cienegas Resource Management Plan is a complete plan for managing the 49,000 acres of public land, resources, and uses within the Las Cienegas National Conservation Area (NCA) and Sonoita Valley Acquisition Planning District (Map 1-1). Both the NCA and Planning District are within the Empire-Cienega Planning Area boundary (Map 1-2) which was delineated prior to their designation by Congress. This plan differs from traditional BLM plans in several **two important** ways:

- ~~It combines both the land use plan and activity plan levels of BLM planning in one document.~~
- It was developed through a collaborative public planning process.
- It is designed to use principles of adaptive management.

Through this document we are making land use plan decisions, including desired resource conditions, **resource land use** allocations, and special designations, **and land tenure decisions** for the Las Cienegas National Conservation Area and public lands within the Sonoita Valley Acquisition Planning District. ~~In the same document we are also preparing an interdisciplinary activity plan for these areas. This activity plan implements The land use plan decisions through a set of~~ The management actions in this plan **include many of the actions** traditionally found in the following documents:

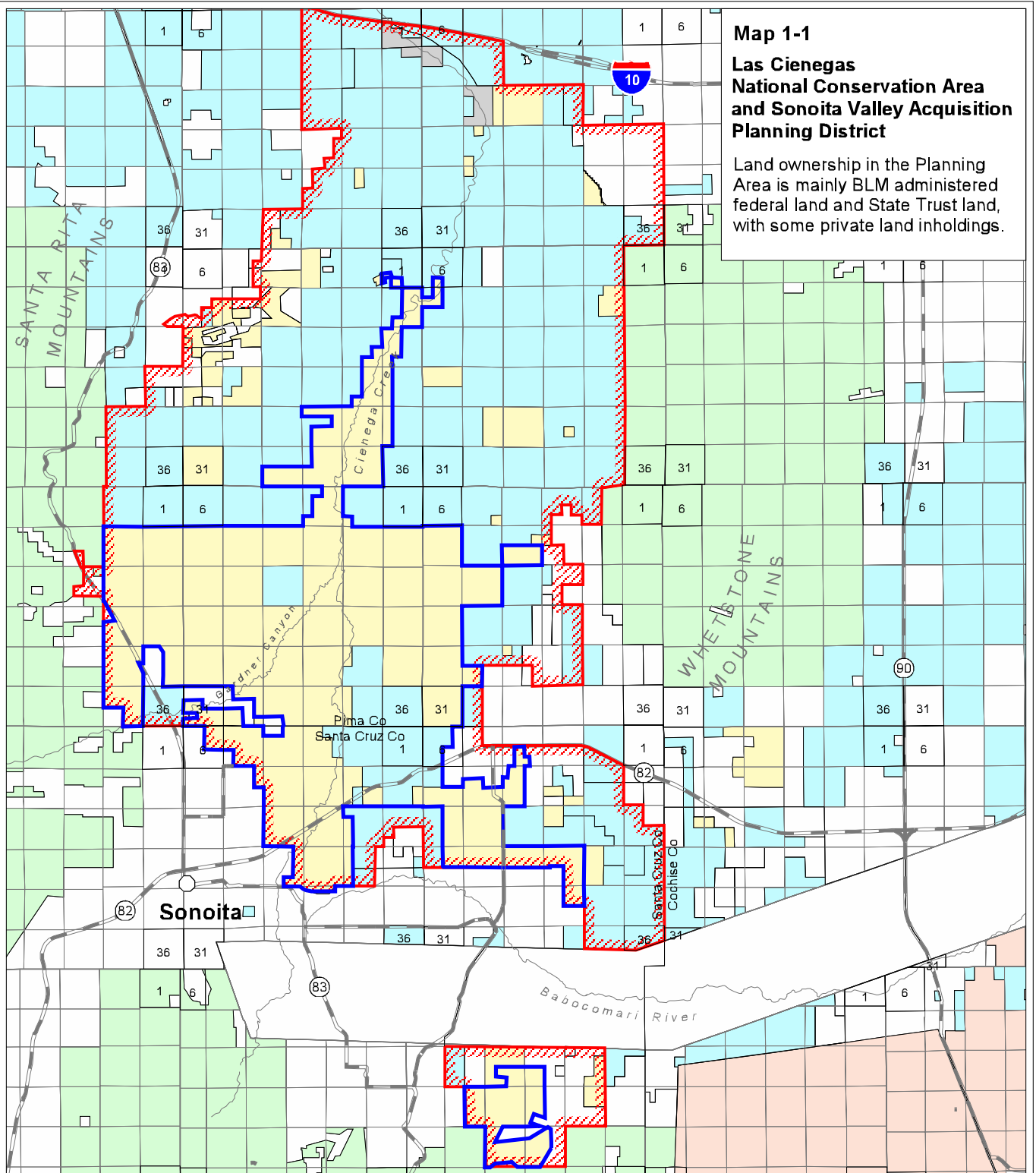
- Watershed management plans
- Wildlife habitat management plans

- Cultural resource management plans
- Allotment management plans
- Recreation management plans

The plan is also integrated with a ~~draft~~ **final** environmental impact statement (**FEIS**) that describes the potential environmental impacts of the proposed Las Cienegas Resource Management Plan. We have prepared the proposed RMP and **FEIS** according to the requirements of the Federal Land Policy and Management Act (FLPMA) and the National Environmental Policy Act (NEPA).

~~We have made every attempt to make the different planning levels in this document as seamless as possible for the reader. But because of the different policies, regulations, and procedures that apply to the two levels of planning, we have decided to differentiate the two levels in Chapter 2, the Description of the Alternatives. In Chapter 2, We have separated the descriptions of the alternatives into two parts. The first part describes the land use plan alternatives **desired resource conditions, resource land use allocations, special designations, and land tenure decisions.** The second part describes the **resource management actions** interdisciplinary activity plans which would be **implemented under** each alternative. Within each alternative, we have arranged the proposed actions by resource topic. We have organized Chapter 4, the analysis of impacts, by affected resource and have described the impacts of **both parts of** each alternative on that resource. ~~Chapter 4 combines the impacts on the affected resources from the two levels of planning.~~~~

We prepared this plan using several of the outcomes of the Sonoita Valley Planning



**Map 1-1**  
**Las Cienegas National Conservation Area and Sonoita Valley Acquisition Planning District**

Land ownership in the Planning Area is mainly BLM administered federal land and State Trust land, with some private land inholdings.

**FINAL**  
**LAS CIENEGAS**  
**RESOURCE MANAGEMENT PLAN**



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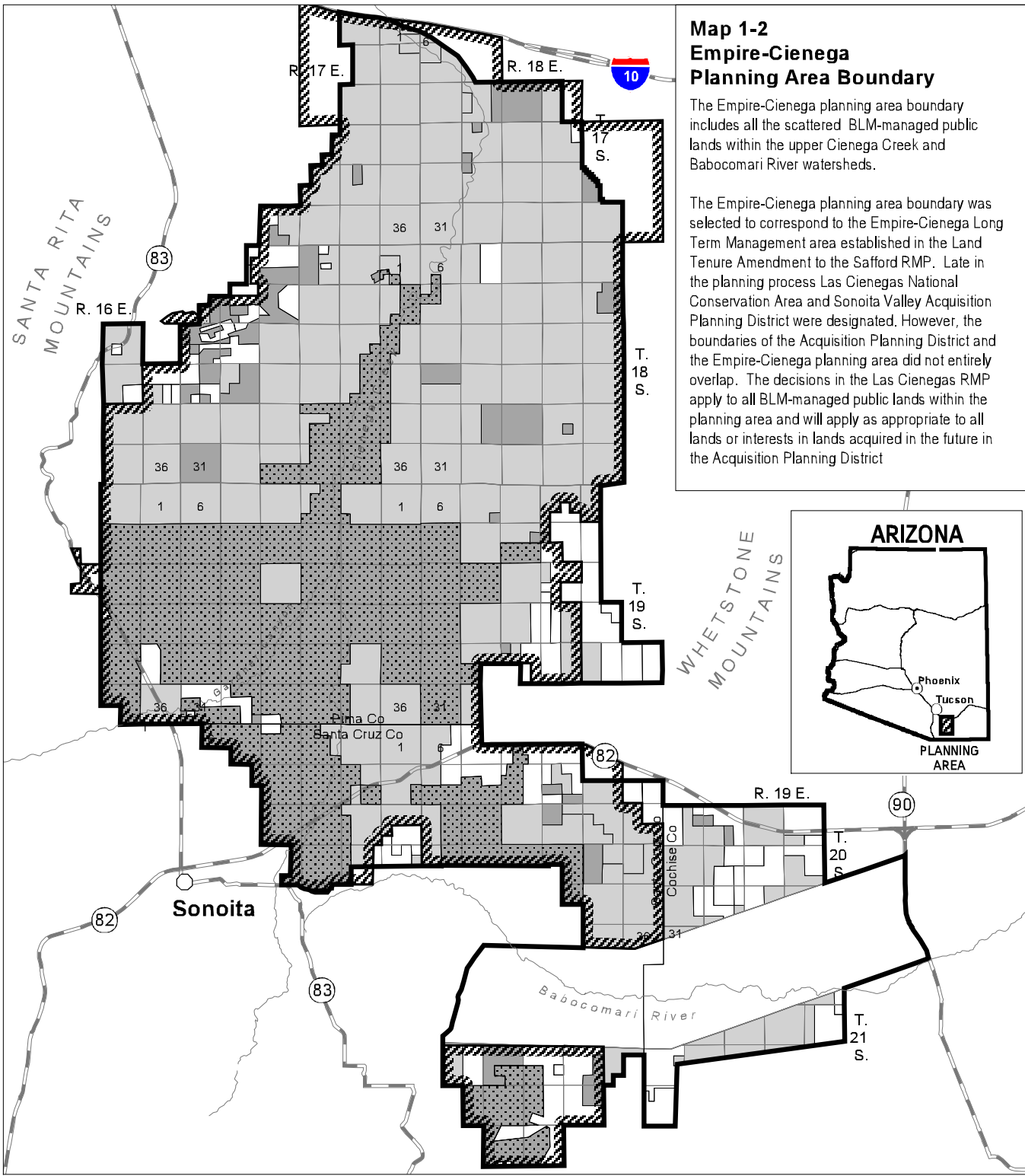
**LEGEND**

- Private Lands
- State Lands
- Bureau of Land Management
- National Forest
- Fort Huachuca
- County Lands
- Las Cienegas National Conservation Area
- Sonoita Valley Acquisition Planning District

### Map 1-2 Empire-Cienega Planning Area Boundary

The Empire-Cienega planning area boundary includes all the scattered BLM-managed public lands within the upper Cienega Creek and Babocomari River watersheds.

The Empire-Cienega planning area boundary was selected to correspond to the Empire-Cienega Long Term Management area established in the Land Tenure Amendment to the Safford RMP. Late in the planning process Las Cienegas National Conservation Area and Sonoita Valley Acquisition Planning District were designated. However, the boundaries of the Acquisition Planning District and the Empire-Cienega planning area did not entirely overlap. The decisions in the Las Cienegas RMP apply to all BLM-managed public lands within the planning area and will apply as appropriate to all lands or interests in lands acquired in the future in the Acquisition Planning District



## FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN

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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Las Cienegas National Conservation Area
- Sonoita Valley Acquisition Planning District

April 2002

## *Chapter 1: Purpose and Need-Background*

Partnership (SVPP). The SVPP is a voluntary association of federal, state, and local agencies, organizations, and private citizens who share a common interest in the resources and management of the public lands within the Sonoita Valley, an area that includes the entire upper watershed of Cienega Creek. The following Planning Process section describes in detail the SVPP collaborative process and its outcomes.

**The agency preferred alternative is the Proposed Plan (Alternative 2) which is also the alternative preferred by participants in the SVPP. Thus, BLM has given “full consideration to the management alternative preferred by the Sonoita Valley Planning Partnership, as it applies to Federal lands or lands with conservation easements” as stipulated in Las Cienegas NCA Act.**

The Las Cienegas Resource Management Plan is one of several ongoing or upcoming planning efforts within the Sonoita Valley. Since we could not attain a broad ecosystem plan that crossed jurisdictional boundaries, the SVPP’s hope is that each planning effort will incorporate the desired conditions for the watershed and develop strategies to achieve them. In this way, we hope to achieve a healthy functional ecosystem.

### **PURPOSE AND NEED**

The Las Cienegas NCA was designated by Congress in December 2000 in order to conserve, protect, and enhance the unique and nationally important aquatic, wildlife, vegetative, archaeological, paleontological, scientific, cave, cultural, historical, recreational, educational, scenic, rangeland and riparian resources and values of the public lands within the NCA (See Appendix 1). The Act establishing the Las Cienegas NCA directed

BLM to prepare a comprehensive management plan for the long-term management of the public lands within the NCA within two years of designation.

The Las Cienegas Resource Management Plan/Environmental Impact Statement has been prepared to guide and implement management for the public lands within the Las Cienegas NCA and Sonoita Valley Acquisition Planning District to ensure that these resources and values are protected and to resolve issues associated with management of the public lands within these areas.

The issues and the planning process are described in more detail in Chapter 1. Chapter 5 provides additional details on the planning process and public input. As specified in the Act, the Proposed Las Cienegas Resource Management Plan has been prepared from a draft of the Empire-Cienega Management Plan, which was in preparation when the NCA was designated, and in accord with the resource goals and objectives developed through the Sonoita Valley Planning Partnership process.

### **BACKGROUND**

In 1988 BLM acquired, through a land exchange, 45,000 acres within the Empire, Cienega, and Rose-tree ranches in northeast Santa Cruz County and southeast Pima County, Arizona. Later exchanges have brought in 4,000 more acres. These lands, which became the Empire-Cienega Resource Conservation Area (RCA), have extremely high social, cultural, and resource values for the local and national public. These values include healthy watersheds, extensive native grasslands, intact riparian systems, endangered and special status species habitats, prehistoric and historic cultural resources, and varied dispersed recreation opportunities.



Over the years since acquisition of the Empire-Cienega RCA, several special designations have been made or proposed for the area because of its significant resources.

- The historic Empire Ranch Headquarters has been proposed for listing on the National Register of Historic Places (The Empire Ranch House is already listed).
- Two segments of Cienega Creek have been proposed to Congress for designation as scenic river segments in the Wild and Scenic Rivers System.
- The American Bird Conservancy has designated the RCA as a continentally important bird area.
- The Appleton-Whittell Area of Critical Environmental Concern (ACEC), designated in the Phoenix Resource Management Plan, has been enlarged and set aside for research.
- Most of the public lands in the RCA (nearly 42,000 acres) have just been designated as the Las Cienegas National Conservation Area. The remainder have been included within the Sonoita Valley Acquisition Planning District (See Map 1-1 and Appendix 1).

While acquiring the public lands within the Empire-Cienega RCA, BLM was completing the Phoenix Resource Management Plan/EIS (BLM 1988) and included in the document interim management guidelines for the area. But it was too late to incorporate and analyze land use planning alternatives for the RCA. As a result, BLM was mandated to develop a land use plan for the acquired public lands within the RCA. The number of special designations and significance of the resources also pointed to the

need to develop a variety of activity-level plans.

After several false starts on developing a land use plan between 1989 and 1994, BLM decided in 1995 to take a new approach that would involve more public participation in all aspects of planning (summarized in Chapter 5). The approach would also improve communication and coordination with surrounding public and private landowners. This desire for a new collaborative approach led to the creation of the Sonoita Valley Planning Partnership, which is discussed in more detail later in this chapter.

## **SETTING**

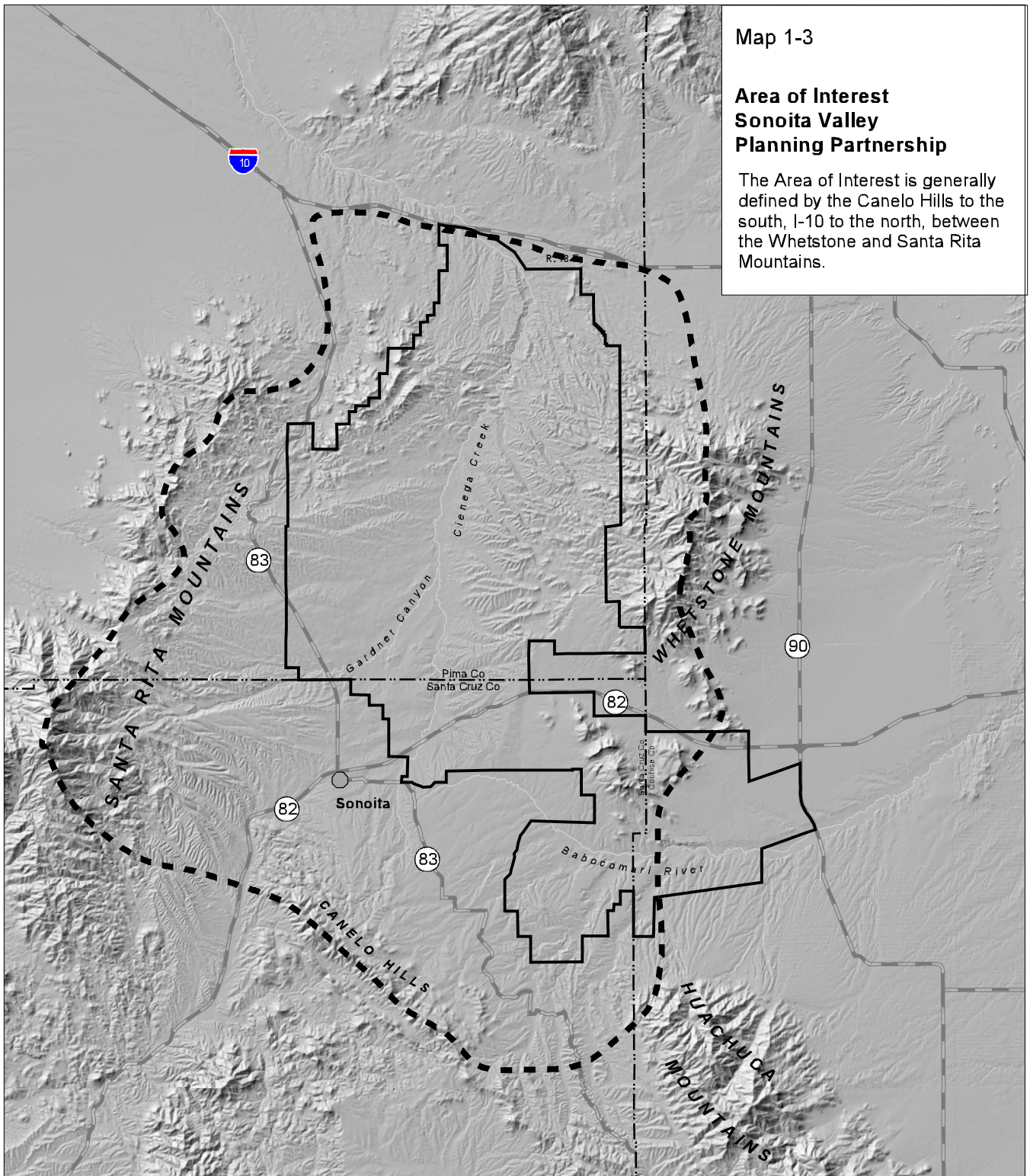
A unique, scenic area of open, rolling grasslands in a high desert basin, the Sonoita Valley (Map 1-3) lies in the uppermost watersheds of three streams in southeast Arizona: the Babocomari River, Cienega Creek, and Sonoita Creek. To the north spread the grasslands and woodlands of the Las Cienegas National Conservation Area managed by BLM. To the south, east, and west are the woodlands and forests managed by two units of Coronado National Forest.

At the crossroads of two scenic highways within an hour of the rapidly growing Tucson metropolitan area, the Sonoita Valley is surrounded by public lands with outstanding dispersed recreation opportunities, a variety of traditional uses, and significant natural resources, including several endangered species. The valley still retains wide open spaces, rural lifestyles and values, and a great variety of plant communities and wildlife. But at the same time the valley is also vulnerable to the impacts of rapid growth and the intensifying conflicts at the urban-rural interface.

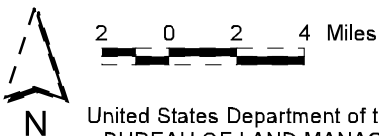
Map 1-3

**Area of Interest  
Sonoita Valley  
Planning Partnership**

The Area of Interest is generally defined by the Canelo Hills to the south, I-10 to the north, between the Whetstone and Santa Rita Mountains.



**FINAL  
LAS CIENEGAS  
RESOURCE MANAGEMENT PLAN**



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LEGEND

- Planning Area Boundary
- - - Area of Interest
- - - County Boundary

Within the Sonoita Valley, the Las Cienegas NCA and Sonoita Valley Acquisition Planning District encompass much of the Upper Cienega Creek watershed, which is important to Tucson for flood control and aquifer recharge. The area also has the following attributes:

- Five of the rarest habitat types in the American Southwest: cienegas, cottonwood-willow riparian areas, sacaton grasslands, mesquite bosques, and semidesert grasslands.
- Habitat for several endangered species.
- A site on the National Register of Historic Places.
- Two proposed wild and scenic river segments.
- Scenic open space.

In addition to Tucson, the area is readily accessible from the nearby towns of Sonoita, Patagonia, Benson, and Sierra Vista. Dirt roads provide access into the area by connecting with State Highways 82 and 83.

## PLANNING AREA

The Empire-Cienega Planning Area boundary corresponds to the Empire-Cienega Long-Term Management Area (LTMA) boundary. The LTMA was designed to encompass all public lands within the Empire-Cienega RCA. BLM established the LTMA in the land tenure amendment to the Safford Resource Management Plan while these lands were being administered by the Tucson Resource Area of the Safford District Office. Under an LTMA designation, BLM retains public lands and blocks them up with other land acquisitions or conservation easements acquired from willing sellers. Appendix 2 discusses this plan amendment under the Description of Management Guidance Common To All Alternatives.

The Empire-Cienega Planning Area encompasses 266 mi<sup>2</sup> (170,558 acres) in southeast Arizona, roughly bounded by Interstate 10 on the north, Arizona State Highway 83 on the west, the Whetstone Mountains on the east, and the Audubon Society's Appleton-Whittell Research Ranch on the south (Map 1-2). Table 1-1 summarizes the acres by ownership within the planning area.

**Table 1-1  
Land Ownership: Empire-Cienega Planning Area**

<b>Land Ownership</b>	<b>Acres</b>	<b>Percentage</b>
BLM	48,956	28.7
State of Arizona	80,706	47.3
Private	40,896	24
<b>TOTAL:</b>	<b>170,558</b>	<b>100</b>

## PLANNING PROCESS

### THE SONOITA VALLEY PLANNING PARTNERSHIP

The Sonoita Valley Planning Partnership (SVPP) is a voluntary association of federal, state, and local agencies; organized groups; and people who share a common interest in the future of public land resources in the Sonoita Valley. Participants come from a variety of communities in southern Arizona including: Sonoita, Elgin, Patagonia, Huachuca City, Sierra Vista, Nogales, Tucson, and Phoenix. Participants also represent organized groups including: conservation organizations; grazing and mining interests; and hiking, bird-dog, mountain biking, and off-highway vehicle clubs. Agency representation has come from the BLM, Nogales, and Sierra Vista Ranger Districts of Coronado National Forest; Natural Resources Conservation Service; U.S. Geological Survey; Arizona Game and Fish Department; Arizona State Land Department; Pima County Parks and Recreation and Planning/Flood Control; and Santa Cruz County. The partnership is open to all--anyone can participate and join at any time.

The Sonoita Valley Planning Partnership was conceived as a way for the community (private, public, government, local, non-local) to come together to resolve local and national issues affecting public lands in the Sonoita Valley. The partnership has increased awareness, communication, understanding, trust, and support among its members. The partnership has also helped us look at the valley as a whole and determine what we want and need in the future.

## ECOSYSTEM PLANNING AND THE COLLABORATIVE APPROACH

The Council on Environmental Quality regulations for implementing the National Environmental Policy Act (NEPA) direct that to the fullest extent possible federal agencies must encourage and facilitate public involvement in decisions that affect the quality of the human environment. Traditionally, BLM and other agencies have involved the public in planning at the initial scoping stage and have then “disappeared” until ready to ask for comments on a draft plan. This process resulted in many people thinking that their comments were ignored and led to a lack of trust in the agencies and outcomes of the process.

In recent years, land use planning has made a major shift toward an ecosystem management approach. Under the ecosystem management approach, planning processes are more open to the public, and the public is involved early in the process. Interested parties are encouraged to help establish goals and determine ways to achieve them. Table 1-2 compares the traditional and ecosystem approaches to land use planning.

The U.S. Interagency Ecosystem Management Task Force in its 1995-1996 report, *The Ecosystem Approach: Healthy Ecosystems and Sustainable Economies*, recommended eight steps in the ecosystem approach. These steps are complementary to the National Environmental Policy Act (NEPA) and guide agencies in implementing and participating in ecosystem efforts:

1. Define the areas of concern or interest.
2. Involve stakeholders.
3. Develop a shared vision of the ecosystem's desired future conditions.

4. Characterize the historical ecosystem and the present environmental, economic, and social conditions and trends.
5. Establish ecosystem goals.
6. Develop and implement an action for achieving the goals.
7. Monitor conditions and evaluate results.
8. Adapt management according to new information

In 1995 BLM’s Tucson Field Office decided to take a new collaborative approach to planning for the Empire-Cienega Planning Area, with full public participation guided by these principles of ecosystem management. This approach resulted in the forming of the Sonoita Valley Planning Partnership (SVPP). This partnership met monthly for four years, focusing at first on developing a shared vision, goals, and specific objectives for the Sonoita Valley. In the last year and a half, the partnership focused on working with BLM to develop alternatives for managing the planning area.

Partnership participants were at first interested in the possibility of developing a broad ecosystem plan for the Sonoita Valley area. But early in the process, they realized that this goal was unattainable, at least in the short term. The focus then shifted to developing desired conditions, goals, and objectives that could be applied to the entire Sonoita Valley and incorporated in different planning efforts as they were undertaken. So far, two planning efforts have incorporated the desired conditions: this Las Cienegas Resource Management Plan and A *Draft Comprehensive Plan for Northeastern Santa Cruz County* prepared by the Sonoita Crossroads Community Forum (2000).

**Table 1-2  
Comparison of the Traditional and  
Ecosystem Planning Approaches to Land  
Use Planning**

Traditional Approach	Ecosystem Approach
<ul style="list-style-type: none"> <li>• Public involvement solicited at selected stages of plan development.</li> </ul>	<ul style="list-style-type: none"> <li>• Public involved throughout process.</li> </ul>
<ul style="list-style-type: none"> <li>• Emphasis on consultation.</li> </ul>	<ul style="list-style-type: none"> <li>• Emphasis on collaboration.</li> </ul>
<ul style="list-style-type: none"> <li>• Process based on issues that may lead to increased polarization.</li> </ul>	<ul style="list-style-type: none"> <li>• Process based on developing desired conditions for area (goals and objectives) leading to increased consensus building.</li> </ul>
<ul style="list-style-type: none"> <li>• Planning boundary based on agency jurisdictional boundary.</li> </ul>	<ul style="list-style-type: none"> <li>• Planning boundary based on ecosystem resources and processes and a blurring of jurisdictional boundaries.</li> </ul>
<ul style="list-style-type: none"> <li>• Traditional management focusing on analysis of conditions at one point-in-time leading to more rigid planning documents.</li> </ul>	<ul style="list-style-type: none"> <li>• Emphasis placed on adaptive management.</li> </ul>
<ul style="list-style-type: none"> <li>• Public involvement generally ends with completion of planning document.</li> </ul>	<ul style="list-style-type: none"> <li>• Continued public involvement in plan implementation and monitoring.</li> </ul>

## SONOITA VALLEY PLANNING PARTNERSHIP OUTCOMES

To date, the Sonoita Valley Planning Partnership has accomplished the following:

- Raised a variety of issues concerning public lands within the Sonoita Valley including the following:
  - Mineral use and impacts
  - Utility rights-of-way and other land uses
  - Managing off-highway vehicles and road and trail networks
  - Establishing and managing a segment of the Arizona Trail
  - Managing outdoor recreation
  - Managing visual resources
  - Designating areas of critical environmental concern (ACECs)
  - Managing livestock grazing
  - Maintaining water quality and quantity
  - Managing riparian and upland vegetation
  - Managing endangered species and fish and wildlife habitats
  - Managing cultural/historical resources
  - Economics
  - Public education

These issues, combined with those generated in earlier work on the Empire-Cienega planning effort, are described in more detail later in this chapter.

- ☐ Developed Desired Future Conditions for the Sonoita Valley including the following:
  - Vision statements for open space, water, healthy diverse grasslands, and traditional uses for the Sonoita Valley. These statements broadly define desired future conditions to maintain or reach in this valley.
  - Broad goals for vegetation, wildlife, water, watershed, cultural resources, recreation, open space, traditional uses, and stewardship of resources. These goals can be applied to all lands within the Sonoita Valley.
  - Specific, measurable objectives for upland and riparian vegetation, watershed, wildlife, cultural resources, and recreation opportunities. These objectives can be applied to all lands within the Sonoita Valley.

BLM has incorporated these desired future conditions as the foundation for this planning effort. These conditions are described in Chapter 2 before the descriptions of the four plan alternatives.

- ☐ Worked with BLM on developing alternative management strategies for the Empire-Cienega Planning Area. Included were strategies on the following:
  - Mineral development
  - Utility-rights of way

- Off-highway vehicle (OHV) designations
  - Road and trails system
  - Recreation zones and sites
  - Visual resource management (VRM)
  - Areas of critical environmental concern
  - Livestock grazing
  - Fish and wildlife management
  - Vegetation management
  - Cultural resources management
- Reached consensus on a preferred alternative that they would like to see BLM implement in the Empire-Cienega Planning Area.
- Provided input on BLM and Forest Service project proposals within the Sonoita Valley.
- Provided input to Sonoita Crossroads Community Forum for *A Draft Comprehensive Plan for Northeastern Santa Cruz County*.

## **RELATIONSHIP TO OTHER AGENCY PLANS (WITHIN AND OUTSIDE BLM)**

### **SONOITA CROSSROADS COMMUNITY FORUM**

Over the past 10 years the Sonoita Valley, including the unincorporated towns of Elgin and Sonoita, has undergone unprecedented growth as more people have discovered the area's

scenic open spaces, pleasant climate, and recreational opportunities. Many residents descend from families who homesteaded this area and still raise livestock and engage in other traditional rural lifestyles. Many of the newer residents commute to Tucson, Sierra Vista, and Nogales. A diverse group, these residents share a common interest in maintaining the traits that they value in the Sonoita Valley. In March 1996, with the support of the Sonoran Institute, residents established the Sonoita Crossroads Community Forum to discuss local values and work toward resolving the area's many issues relating to rapid growth.

In April 2000, the Sonoita Crossroads Community Forum released *A Draft Comprehensive Plan for Northeastern Santa Cruz County*. This plan includes: policies and strategies for building effective partnerships between the community and land management agencies; maintaining open space and rural character; and promoting quality development, both commercial and residential, at the Sonoita Crossroads. The group's intent is to have its plan adopted as part of the Santa Cruz County Comprehensive Plan.

### **EMPIRE RANCH FOUNDATION**

The Empire Ranch Foundation, a nonprofit corporation, was established in 1997 to improve the public's historic, natural, and recreational resources and educational experience at the Empire Ranch. Initially the Foundation is focusing on securing funding to stabilize and eventually restore the historic Empire Ranch headquarters. As part of this effort, the Foundation is helping develop a phased adaptive use plan (master plan) for the complex. This plan determines public uses of the complex, including interpretive, educational, research, administrative, and program support, at a level compatible with other resource goals.

## **CORONADO NATIONAL FOREST**

The Empire-Cienega Planning Area is bounded on three sides by national forest lands within two units of Coronado National Forest—to the west is the Nogales Ranger District and to the east and south is the Sierra Vista Ranger District. The Coronado National Forest Plan (Forest Service 1986) is the comprehensive land use plan defining management direction for these lands. The intended life of the plan was 10-15 years and the plan is now due for revision.

## **PLANNING ISSUES**

Twelve major planning issues were generated for the Empire-Cienega Planning Area from initial public scoping, the collaborative planning process, and BLM interdisciplinary team members. These issues can be grouped into three categories: (1) desired future conditions, (2) land use allocations, and (3) special designation areas.

Desired future conditions include the following:

- Goals that are generally broad statements of desired outcomes.
- Standards that describe the physical and biological condition or degree of function a resource must meet to sustain ecological processes.
- Objectives that state specific, measurable desired conditions for resources.

Land use allocations include determining allowable uses and broad use levels such as surface lands where certain uses are allowed or excluded.

Special designations are proposed for areas with nationally, regionally, or locally significant resources where special management attention is needed, such as areas of critical environmental concern.

Following the description of each major planning issue are the related implementation issues. BLM would apply laws, regulations, and its public land planning and management guidance in resolving these issues. This management guidance, also known as planning criteria, is summarized in Chapter 2 and described in more detail in Appendix 2.

## **ISSUES REGARDING DESIRED RESOURCE CONDITIONS**

### **Watershed: Upland, Riparian, and Aquatic Areas**

BLM's Fundamentals of Rangeland Health (43 CFR 4180) provide direction for the development of resource objectives and the selection of appropriate management actions to achieve them. The Fundamentals of Rangeland Health include having watersheds that are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components. These fundamentals also encompass the ecological processes of watersheds. These processes include the hydrologic cycle, nutrient cycle, and energy flow that are maintained, or toward whose attainment significant progress must be made, to support healthy biotic populations and communities. BLM Arizona's standards for achieving rangeland health include ensuring proper functioning condition and desired vegetation condition of upland and riparian areas according to sound management practices (guidelines).



*Issues Regarding Desired Resource Conditions*

***Issue 1: What level of resource use within upland areas would be compatible with ensuring maintenance or improvement of desired conditions?***

Related implementation issues (watershed/upland):

- a. To what extent should we use fire and other tools or allow natural fires to reduce the spread of exotic or undesirable native plants in the grassland?
- b. How do we ensure fire protection for residents while conducting public land fire management activities?
- c. Accounting for climactic variability (drought) in proposals.
- d. Poor upland management practices in some areas.
- e. Depletion of vegetation in some areas (concentrated use areas).

***Issue 2: What level of resource use within riparian (streamside) areas would be compatible with ensuring maintenance or improvement of desired conditions?***

Related implementation issues (riparian):

- a. Diversion, consumption, and extraction of water as they relate to maintaining perennial water in creeks.
- b. Impacts on water recharge factors from soil and vegetation conditions.
- c. Ensuring protections for sensitive riparian areas in proposals.

- d. Are there impacts from manure (nonpoint source) on water quality? If so, how do we eliminate or minimize impacts to ensure that we meet quality standards.
- e. Are there problems with sediment load in streams in the planning area and are sediment loads affecting water quality? If so, what measures can we take to reduce impacts?
  - i. High sediment loads in Apache, Fresno, Wood, Gardner, **Mattie Canyon**, and Springwater Canyons are a concern.
  - ii. Mattie Canyon down-cutting from recent flooding may affect upstream portions of Mattie Canyon as well as Cienega Creek downstream from the confluence.

***Issue Tracking:***

*Chapter 2 (Alternatives): The Land Use Plan section of each alternative prescribes desired condition goals and objectives for watersheds and upland and riparian areas. Common to Alternatives 2, 3, and 4 are specific management actions for achieving and maintaining desired vegetation conditions, including vegetation treatments, control of exotics, and watershed restoration projects. These actions are listed in the **Activity Plan Management Actions** for Alternative 2 and referenced in the other alternatives.*

*Chapter 3 (Affected Environment): The watershed, upland vegetation, and riparian vegetation sections describe these resources and their conditions.*

*Chapter 4 (Impacts): The Impacts to watershed, water quality, upland vegetation, and riparian vegetation sections describe impacts to these resources from each of the alternatives. The relevant sections also describe impacts **from***

## Chapter 1: Planning Issues

*watershed and upland and riparian vegetation management on other resources and users.*

### **Fish and Wildlife Habitat Management**

The Empire-Cienega Planning Area provides habitat for at least 37 special status species, including 11 federally listed or candidate species that need special attention. In addition, the diversity of habitats supports a wide variety of more common game and non-game fish and wildlife species. If not properly managed, other uses of the public lands can damage wildlife habitat. BLM's Fundamentals of Rangeland Health (43 CFR 4180) includes having habitats that have been or are making significant progress toward being restored or maintained for federal threatened and endangered species, federal proposed and candidate species, and other special status species. BLM Arizona's standards for achieving rangeland health include ensuring that productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

**The Las Cienegas Act of December 2000 directs BLM to include "wildlife management strategies for the Conservation Area, prepared in consultation with appropriate departments of the State of Arizona and using previous studies of the Conservation Area" in this management plan.**

#### ***Issue 3: How can we maintain healthy native wildlife populations and critical wildlife areas?***

Related implementation issues:

a. Are available natural water sources adequate for wildlife, or do we need to enhance natural waters or develop artificial water sources to maintain and enhance wildlife populations?

- b. What role should the planning area play in the recovery of endangered and extirpated fish, wildlife, and plant species? What priority should we give endangered species recovery?
- c. What management is needed to mitigate adverse impacts to wildlife movements from human development and activities now and in the future?
  - i. Do we need more fence modifications to mitigate impacts on wildlife movements?
  - ii. Do we need seasonal closures or restrictions on roads or other uses to mitigate impacts on wildlife movements?
- d. What are the causes of the low pronghorn reproduction and what management should we consider to improve pronghorn reproductive rates (fawn survival)?
  - i. Do we need to close roads seasonally or restrict other uses?
  - ii. Is vegetation cover adequate for fawning?
  - iii. Are available water sources adequate?
- e. How should we control or manage exotic fish and wildlife to eliminate or minimize harm to native fish and wildlife?
  - i. Bullfrogs in Cienega Creek and ponds in the watershed may harm native fish and aquatic wildlife.
- f. What vegetation cover types and compositions should we manage for within the planning area to benefit wildlife?

- i. Past management practices have changed the condition, aspect, and distribution patterns of vegetation communities from what was historically present.
- ii. Adequate vegetation cover for pronghorn fawning may not be present each year.
- iii. Adequate vegetation cover for grassland sparrows may not be present each year.

***Issue Tracking:***

*Chapter 2 (Alternatives): The Land Use Plan section of each alternative prescribes desired condition goals and objectives for fish and wildlife as well as land use allocations to support proposals for reintroducing threatened and endangered species. Common to Alternatives 2, 3, and 4 are specific management actions for fish and wildlife, including habitat improvements, control of exotic species, and constraints on grazing and recreation. These actions are listed in the **Activity Plan Management Actions** for Alternative 2 and referenced in the other alternatives.*

*Chapter 3 (Affected Environment): The Fish and Wildlife section describes biological diversity and conditions of fish and wildlife habitats (including those of threatened, endangered, and special status species).*

*Chapter 4 (Impacts): The Impacts to Fish and Wildlife section describes impacts to fish and wildlife (including threatened, endangered, and special status species) from each of the alternatives. Relevant sections also describe the impacts **from** fish and wildlife management on other resources and users.*

**Visual Resources**

Crossing the Empire-Cienega Planning Area is State Highway 83, a designated scenic route in the State Highway System. The planning area also provides most of the viewshed from Highways 82 and 83 between the Whetstone and Santa Rita mountains. *A Draft Comprehensive Plan for Northeastern Santa Cruz County*, prepared by the Sonoita Crossroads Community Forum (April 2000), recognized public lands in the planning area in Santa Cruz County as having high visual resource preference values. The planning area has no significant visual intrusions on public lands. Currently there are no designated visual resource management (VRM) classifications, but generally the planning area fits into VRM category II and III (See Appendix 2).

***Issue 4: What should be the VRM designation on the public lands within the planning area to maintain visual resource values ?***

***Issue Tracking:***

*Chapter 2 (Alternatives): The Land Use Plan section of each alternative prescribes desired conditions for visual resources using Visual Resource Management classes.*

*Chapter 3 (Affected Environment): The Visual Resources section describes the quality of visual resources in the planning area.*

*Chapter 4 (Impacts): The Impacts to Visual Resources section describes impacts to visual resources from each of the alternatives. The relevant sections also describe impacts **from** visual resource management on other resources and users.*

## Chapter 1: Planning Issues

### Cultural Resources

Dating back more than 7,000 years, the planning area's cultural resources include prehistoric and historic sites. The Empire Ranch House is a National Register site. BLM employs a management system to protect and preserve cultural resources on public land and areas of agency responsibility. The system allows scientific, public, and sociocultural uses specified under legal mandates, acts, regulations, and agency policy.

**The Las Cienegas Act of December 2000 directs that BLM shall include “cultural resources management strategies for the Conservation Area, prepared in consultation with appropriate departments of the State of Arizona, with emphasis on the preservation of the resources of the Conservation Area and the interpretive, educational, and long-term scientific uses of these resources, giving priority to the enforcement of the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa et seq.) and the National Historic Preservation Act (16 U.S.C. 470 et seq.) within the Conservation Area” in this management plan.**

*Issue 5: Which cultural resource properties should be allocated for research, educational, and interpretive uses?*

#### **Issue Tracking:**

*Chapter 2 (Alternatives): The Land Use Plan section of each alternative prescribes desired condition goals and objectives for cultural resources. The activity plan management actions for each alternative prescribe specific management actions for cultural resources, including allocations of sites.*

*Chapter 3 (Affected Environment): The Cultural Resources section describes the length and evidence of human occupancy in the planning*

*area and the condition of cultural and paleontological resources.*

*Chapter 4 (Impacts): The Impacts to Cultural Resources section describes impacts to cultural resources from each of the alternatives. Relevant sections also describe the impacts from cultural resource management on other resources and users.*

### Economics/Quality of Life

The Sonoita Valley Planning Partnership's vision statement reflects the desire of the diverse participants to maintain the area's rural character. In addition, the Sonoita Crossroads Community Forum states in its community goal for integrating open space in developments that maintaining an open rural character is essential to the community's quality of life, market appeal, and property values. The planning area's public lands significantly contribute to the area's open space character. Management decisions for these lands could affect this character as well as the area's economic development.

*Issue 6: What types and levels of resource use and management are compatible with ensuring the maintenance of desired economic and quality-of-life conditions?*

Related implementation issues:

- a. How do our actions reflect on the economics of the region, both private and public?
- b. How will growth affect the area and its uses and will growth allow for sustainability of resources?
- c. How will attitudes (expectations, balance, respect, communication, rural versus urban, education) affect the area and its uses?

**Issue Tracking:**

*Chapter 3 (Affected Environment): The Social and Economic Concerns section describes quality/way of life, population and demographics, local and regional economy, employment, and environmental justice.*

*Chapter 4 (Impacts): The Impacts to Social and Economic Concerns section describes impacts to socioeconomic conditions from each of the alternatives.*

**ISSUES RELATED TO LAND USE ALLOCATIONS**

**Mining**

All public lands within the planning area are closed to mining except for 458 acres of original public domain and 5,900 acres of federal mineral estate with private or state surface ownership.

**The December 2000 act creating Las Cienegas NCA withdraws, subject to valid existing rights, “all Federal lands within the Conservation Area and all lands and interest therein which are hereafter acquired by the United States” from “all forms of entry, appropriation, or disposal under the public land laws and from location, entry, and patent under the mining laws, and from operation of the mineral leasing and geothermal leasing laws and all amendments thereto.”**

***Issue 7: Should any acquired lands be opened to locatable or leasable mineral development? If mining is not allowed, should public domain lands now open to mining be withdrawn? If mineral development is allowed, should surface occupancy for fluid mineral leases be prohibited in any areas? Should any areas be open to salable mineral disposal?***

Related implementation issue:

- How will the opening of any new mine affect watershed health?

**Issue Tracking:**

*Chapter 2 (Alternatives): The Land Use Plan section of each alternative allocates land for mineral development.*

*Chapter 3 (Affected Environment): The Mineral Development section describes the area’s mineral potential and existing mineral development.*

*Chapter 4 (Impacts): The Impacts to Mineral Development section describes impacts to mineral development from each of the alternatives. Relevant sections also describe impacts **from** mineral development on other resources and users.*

**Utility Corridors**

One use of public lands is for major utility corridors such as power or gas lines. BLM’s goal is to ensure that needed utility corridors can be developed without harming significant public resources. Two major utility rights-of-way already cross the planning area. Recently, with the deregulation of the power and communication industries, requests to route electric and fiber optic lines across public lands have dramatically increased. A *Draft Comprehensive Plan for Northeastern Santa Cruz County*, prepared by the Sonoita Crossroads Community Forum (2000), states that “construction of overhead high voltage power lines that do not provide local service is not consistent with the open space and scenic values that attract residents and visitors to our community” and “if a high voltage power line is permitted, its construction should be mitigated through the protection of remaining scenic values.”

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### ***Issue 8: What public land, if any, should BLM designate as utility corridors in the Empire-Cienega Planning Area?***

Related implementation issue:

- How will BLM accommodate public landuses such as rights-of-ways for utilities while ensuring that it achieves desired resource conditions?

#### ***Issue Tracking:***

*Chapter 2 (Alternatives): The Land Use Plan section of each alternative allocates land for utility corridors.*

*Chapter 3 (Affected Environment): The Lands and Realty Actions section describes existing utility rights-of-way and other land use permits.*

*Chapter 4 (Impacts): The Impacts to Land Use Permits section describes impacts to development of utility corridors and other land use permits from each of the alternatives. Relevant sections describe the impacts from developing utility rights-of-way and issuing land use permits.*

### **Off-Highway Vehicles (OHV)**

The use of off-highway vehicles (OHVs) continues to increase on public lands, including those within the Empire-Cienega Planning Area. The interim management guidelines for the area restrict motorized vehicles to designated roads, but BLM has never fully implemented this designation. To help manage rapidly expanding motorized vehicle use, in 1999, BLM developed an access guide (map/brochure) for the area and partially implemented a road numbering system. Both actions were funded by a grant from the Arizona State Park's OHV program. The planning area offers high-quality OHV experiences, but vehicles are increasingly and

illegally traveling off established roadways which damage resources in the process.

**Except where needed for administrative purposes or to respond to an emergency, the December 2000 Las Cienegas NCA Act limits the use of motorized vehicles on public lands in the Conservation Area to roads and trails designated for use of motor vehicles in this management plan. BLM is directed to include "provisions designed to ensure that if a road or trail located on public lands within the Conservation Area, or any portion of such a road or trail, is removed, consideration shall be given to providing similar alternative access to the portion of the Conservation Area serviced by such removed road or trail" in the management plan.**

***Issue 9: What public land should be proposed as open, closed, or limited in some way to motorized vehicles? (OHV designations are usually: 1) open, 2) limited to existing roads, 3) limited to designated roads, or 4) closed.***

Related implementation issues:

- a. Vehicles crossing perennial portions of Cienega Creek and associated recreational use are harming fish, wildlife, and riparian areas.
- b. Many duplicate routes for travel to the same locations within the planning area increase the potential for impacts to vegetation, wildlife, and cultural resources.
- c. Throughout the public lands, "wildcat" roads and camp areas created by illegal off-road vehicle use damage resources.

#### ***Issue Tracking:***

*Chapter 2 (Alternatives): The Land Use Plan section of each alternative allocates areas for use by off-highway vehicles. The activity plans*

**management actions** for each alternative describe the designated routes for motorized and non-motorized travel.

*Chapter 3 (Affected Environment): The Outdoor Recreation section describes visitor use (including off-highway vehicle use) and access*

*Chapter 4 (Impacts): The Impacts to Outdoor Recreation section describes impacts to recreation opportunities and access from each of the alternatives. Relevant sections describe the impacts from off-highway vehicle designation on other resources and users.*

## Recreation Zones

The planning area has a variety of recreation uses, increasing visitor levels, and a high potential for resource conflicts. Recreation zones are designated to maintain or enhance recreation opportunities. These zones can be used to prescribe recreation management across concentrated and dispersed recreation areas.

**The Las Cienegas NCA Act of December 2000 states that recreation is allowed to continue in appropriate areas and that, in preparing this management plan, the BLM shall include recreation management strategies, including motorized and nonmotorized dispersed recreation opportunities for the Conservation Area, prepared in consultation with appropriate departments of the State of Arizona. BLM is directed to include “an implementation plan for a continuing program of interpretation and public education about the resources and values of the Conservation Area” in this management plan.**

***Issue 10: What public land should be proposed for designation as recreation zones for varied recreation opportunities and management strategies?***

Related implementation issues:

- a. How should BLM manage recreation to limit harm to fish, wildlife, and vegetation?
  - i. In Oak Tree Canyon, campfires and the parking of vehicles under the trees are harming the oaks.
  - ii. Throughout the public lands, illegal off-road vehicle use is creating “wildcat” roads and camp areas which damage resources (same as issue “c” under off-highway vehicles).
  - iii. Vehicles crossing perennial portions of Cienega Creek and associated recreational use are harming fish, wildlife, and riparian areas (same as issue “a” under off-highway vehicles).
  - iv. Recreation may harm some of the federally listed or other special status species.
- b. How can BLM continue to assure public access?
- c. How can BLM assure the quality of recreational opportunity settings and experiences for a variety of users?
- d. What types of trails and uses should BLM allow and provide?
- e. How will BLM accommodate proposals for the Arizona Trail?
- f. How will BLM educate visitors?
- g. Visitor safety concerns:
  - i. Some people drive their vehicles too fast for road conditions creating hazards for other vehicles, non-motorized users, and livestock.

## Chapter 1: Planning Issues

- ii. Visitors to existing sites with picnic tables (Empire Gulch and North Canyon) are endangered by branches that could drop from large cottonwoods.
- iii. Signs are not effectively closing hazardous roads with sinkholes adjacent to Cienega Creek (Fall area).

### **Issue Tracking:**

*Chapter 2 (Alternatives): The Land Use Plan section of each alternative allocates recreation zones. The activity plans **management actions** for each alternative describe management within these zones, including designated group sites and camp areas, road maintenance, visitor education, and management of dispersed recreation.*

*Chapter 3 (Affected Environment): The Outdoor Recreation section describes visitor use (including off-highway vehicle use) and access.*

*Chapter 4 (Impacts): The Impacts to Outdoor Recreation section describes impacts to recreation opportunities and access from each of the alternatives. Relevant sections also describe impacts **from** recreation zone designation and management on other resources and users.*

### **Livestock Grazing**

BLM has five active grazing leases within the planning area. One of these is covered under the Safford District Resource Management Plan (BLM 1991)/Eastern Arizona Grazing EIS (BLM 1986). The remaining four are on the recently acquired lands within the planning area and need to be addressed in this planning effort. In addition, a sixth grazing allotment has been proposed for BLM-managed lands in the Empire Mountains.

The Sonoita Crossroads Community Forum and participants in the Sonoita Valley Planning Partnership recognized the Sonoita Valley area's ranching heritage as a factor contributing to the area's character. People and groups have also expressed concern about conflicts between livestock grazing and wildlife species and habitats.

**The Las Cienegas NCA Act of December 2000 states that livestock grazing is allowed to continue in appropriate areas and that BLM shall "permit grazing subject to all applicable laws, regulations, and Executive orders consistent with the purposes of this Act". BLM is directed to include "production livestock grazing management strategies, prepared in consultation with appropriate departments of the State of Arizona" and "provisions designed to ensure the protection of environmentally sustainable livestock use on appropriate lands within the Conservation Area" in this management plan.**

***Issue 11: Which areas should be grazed or not grazed? For grazed areas, what level of use is proper for achieving and maintaining desired conditions?***

Related implementation issues:

- a. How does livestock grazing affect the ecosystem and does livestock grazing conflict with maintaining and improving vegetation resources?
- b. How do we resolve wildlife-livestock conflicts?
  - i. Adequate cover may not be present for pronghorn fawning and for grassland sparrows each year.
  - ii. Livestock grazing may harm federally listed or other special status species.



**Issue Tracking:**

*Chapter 2 (Alternatives): the Land Use Plan section of each alternative allocates land for livestock grazing. The ~~activity plans~~ **management actions** for each alternative describe livestock grazing management within each grazing allotment, including grazing system, stocking rate, utilization, and range improvements.*

*Chapter 3 (Affected Environment): The Upland Vegetation section describes the current conditions of the range. The Livestock Grazing section describes existing livestock grazing allotments and management.*

*Chapter 4 (Impacts): The Impacts to Livestock Grazing section describes impacts to livestock grazing operations from each of the alternatives. Relevant sections also describe impacts **from** livestock grazing on other resources and users.*

**ISSUES RELATING TO SPECIAL DESIGNATIONS OF PUBLIC LANDS**

**Areas of Critical Environmental Concern**

The planning area contains many resources of special significance. BLM can designate lands as areas of critical environmental concern (ACEC) if they have more than locally significant resources or resource concerns. BLM then prescribes management guidelines for ACECs to protect their special resources. The following are examples of ACECs:

- Areas with significant wildlife, rare plants, or wetlands.

- Areas with significant historical, cultural, or paleontological resources.
- Areas with hazardous conditions.
- Research areas.

BLM has received several proposals for designations of ACECs within the planning area during scoping for this planning effort. Two proposals were for designating Cienega Creek as an ACEC for its riparian values and one proposal was for an ACEC at Nogales Springs for its riparian values. The Sonoita Valley Planning Partnership process proposed designating all the planning area's public lands as an ACEC.

***Issue 12: What public land in the Empire-Cienega Planning Area should BLM designate as areas of critical environmental concern (ACECs) or for other special management?***

**Issue Tracking:**

*Chapter 2 (Alternatives): The Land Use Plan section of each alternative proposes designating areas of critical environmental concern (ACEC). The ~~activity plans~~ **management actions** for each alternative describe the ACEC management plans.*

*Chapter 3 (Affected Environment): The Special Designations section describes the current special designation areas, including ACECs and wild and scenic river segments.*

*Chapter 4 (Impacts): The Impacts to Special Designations section describes impacts to existing ACECs and wild and scenic river segments from each of the alternatives. Relevant sections also describe the impacts **from** designating new ACECs on other resources and users.*

## ISSUES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

**a. Impacts from sewage (point source) on water quality.**

Managing sewage is not within the scope of this planning effort. County planning and zoning departments regulate these impacts by issuing building permits and inspecting construction and related infrastructure.

**b. Impacts from industrial chemicals (such as cyanide from mining) on water quality.**

The Environmental Protection Agency and Arizona Department of Environmental Quality regulate industrial chemicals, including those from mining. BLM would consider these potential impacts in assessing any mining plans of operations.

**c. Enforcement: How will use be policed and who will do it (limitation, permits, designated areas, etc.)?**

BLM generally has limited law enforcement coverage of public lands. The amount and level of coverage for any area is based on many factors including public safety, sensitivity of resources, level of public use, and workforce and budgetary constraints.

**d. How do honeybees and bee-keeping affect the ecosystem?**

This question has been placed in the Information Needs section of Chapter 2.

**e. What changes in management practices do we need to sustain wildlife populations and still have hunting?**

Hunting is regulated by the Arizona Game and Fish Commission, which sets harvest limits in response to an analysis of harvest and population data collected by the Arizona Game and Fish Department (AGFD). BLM and AGFD regularly coordinate on habitat conditions or management practices that may be harming wildlife populations. They then work toward resolving those issues.

**f. The planning area needs proactive management to compensate for impacts from surrounding land uses.**

This Proposed Las Cienegas Resource Management Plan describes four alternative management strategies that include many proactive strategies to compensate for impacts from surrounding land uses. Some examples include vegetation treatments, control of exotic species invasions, coordination with other agencies or land owners in the watershed, instream flow applications, and recreation zone management.

**g. How to plan for the number of uses versus type of use (per capita use) and for increased uses.**

This Proposed Las Cienegas Resource Management Plan has included management strategies that consider increased uses and balancing types and levels of resource uses. Two examples are (1) utility corridors, which consider the increasing demands for routing utility lines across public lands, and (2) recreation zones and site management, which consider the increasing number and types of recreation users on the public lands

**h. Land Tenure: Should public lands within the planning area be retained? Should more public lands be acquired?**

The Land Tenure Amendment to the Safford District RMP (BLM 1994b) analyzed this issue for the public lands within the Empire-Cienega Planning Area. When the Land Tenure Plan Amendment was completed, the Safford Field Office administered the planning area. The plan amendment designated long-term management areas (LTMA) where public lands would be retained and blocked up with other land acquisitions or conservation easements. The Empire-Cienega Planning Area is one of the LTMA designated in the plan amendment. The LTMA designation and management prescriptions are common to all alternatives in the Proposed Las Cienegas Resource Management Plan. Appendix 2 includes a more detailed discussion of this plan amendment under Description of Management Guidance Common To All Alternatives.

**The Sonoita Valley Acquisition Planning District (APD) was designated in the Act establishing the Las Cienegas National Conservation Area (NCA) in order to provide for future acquisitions of important conservation land within the Sonoita Valley region of the State of Arizona. The Las Cienegas NCA Act directs that “[t]he Secretary shall negotiate with land owners for the acquisition of lands and interest in lands suitable for Conservation Area expansion that meet the purposes described in section 4(a)” (of the Act). The Secretary shall only acquire property under this Act pursuant to section 7 (of the Act)”. The Act requires that acquisitions of lands or interest in lands be from willing sellers only. BLM has developed an acquisition strategy for lands within the Sonoita Valley**

**Acquisition Planning District and has incorporated it into the Proposed Plan (Alternative 2) and other action alternatives.**

**i. Local Growth Issues (Zoning, Business/Commercial Area, Types of Housing, Infrastructure)**

These issues relating to private lands and local growth have been addressed by the Sonoita Crossroads Community Forum (2000) in *A Draft Comprehensive Plan for Northeastern Santa Cruz County*.

**j. Wilderness**

Because the public lands in the planning area were reconveyed from private ownership after the statewide wilderness review was completed for BLM lands in Arizona, potential wilderness values were not inventoried. An initial review was completed for this planning process to determine if the area contains potential wilderness values by applying the size and roadless criteria (> 5000 roadless acres). The existing system of roads was inventoried for transportation planning purposes. The planning area includes a contiguous block of public land over 5000 acres in size, but an extensive system of existing roads crosses public land dividing it into numerous sub-units. Four sub-units greater than 5000 acres were identified, but these are entirely private or State Trust lands, or a combination of both. The largest sub-unit comprised of BLM land is just over 4,000 acres and is bounded on two sides (north and east) by the South Road (EC-900) and on the south by State Highway 82. Since this sub-unit does not meet the size criteria, further wilderness review is not required and wilderness is not an issue analyzed in this EIS.

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**k. Rain Valley Allotment (Number 5297)**

The Rain Valley grazing allotment consists of 160 acres of BLM land and has one cow year-long (CYL) allocated. The public lands within this grazing allotment are part of the Safford Planning Unit and were included in the Safford RMP and the Eastern Arizona Grazing EIS. The 160 acres were included in the Empire-Cienega Long-Term Management Area which was designated in the Land Tenure amendment to the Safford RMP and therefore were included within the Empire-Cienega planning boundary. These public lands are covered under an existing RMP and already analyzed in an EIS. No specific issues were identified with these lands and no management changes are proposed for this allotment; therefore, it is not being analyzed in this EIS.

**l. Cave Resources**

The Las Cienegas NCA Act of December 2000 directs that BLM include “cave resources management strategies prepared in compliance with the goals and objectives of the Federal Cave Resources Protection Act of 1988 (16 U.S.C. 4301 et seq.)” in this management plan.

There are no known cave resources within the current boundaries of Las Cienegas NCA. It is possible that acquired lands added to the NCA in the future may have cave resources. If BLM acquires lands with cave resources in the future, then this management plan will be modified or amended as necessary to incorporate appropriate protection measures for those resources.

## CHAPTER 2

# DESCRIPTION OF ALTERNATIVES



A doorway in the historic Empire Ranch Headquarters frames a view of the natural vegetation.

# CHAPTER 2

## DESCRIPTION OF ALTERNATIVES

### INTRODUCTION

Chapter 2 describes four alternative integrated management plans for public lands within the Empire-Cienega Planning Area and summarizes the expected impacts to the environment resulting from implementing each of the alternatives.

The first section of Chapter 2 summarizes management guidance common to all alternatives. Regardless of the alternative it selects as the approved plan, BLM would follow this management guidance, which consists of laws, regulations, and policies.

The next **second** section of Chapter 2 describes the desired future conditions for the Empire-Cienega Planning Area. These conditions are the foundation for the integrated management plan. Each action alternative consists of proposed management strategies for achieving and maintaining the desired future conditions while providing for differing but compatible levels of human use.

Chapter 2 then discusses each alternative management plan in detail. This section is divided into two parts. **Part A describes proposals at the resource management plan (RMP) level (generally broader resource allocations) for each alternative. Part B describes proposals at the activity plan level (on-the-ground management actions) that would be implemented for each alternative. Part A describes the desired resource conditions, land use allocations, special designations, and land tenure decisions which are part of each land use plan alternative. Part B describes the resource**

**management actions which would be implemented under each alternative.** Each part begins with a description of the No Action Alternative of continuing current management followed by descriptions of three alternative proposals (Action Alternatives). Together, the two parts of each alternative constitute a complete plan to guide management of the public land resources and uses.

Each of these alternative plans would implement an adaptive management strategy. As BLM obtains new information, it would evaluate monitoring data and other resource information to periodically refine and update desired conditions and management strategies. For this reason, the four alternative management plans each represent a set of strategies that BLM could employ at a particular time and that were selected from the full spectrum of possible strategies under an adaptive management scenario.

~~The next section of Chapter 2 describes~~ **Following the description of the alternatives, Chapter 2 discusses plan implementation and then** the monitoring program and plan evaluation process which would be used to support the adaptive management strategy.

**Afterwards,** Chapter 2 ~~then~~ describes inventories or studies needed or desirable before implementing some of the management actions.

~~The last section of Chapter 2~~ **Finally, Chapter 2 concludes with Table 2-32 which** summarizes the potential environmental impacts of each alternative as a reference for comparing impacts.

## **MANAGEMENT GUIDANCE COMMON TO ALL ALTERNATIVES**

### **SUMMARY OF MANAGEMENT GUIDANCE**

Regardless of the alternative chosen, BLM's management of public lands and resources is governed by many laws, regulations, and policies. Although not all of these can be summarized in this document, Table 2-1 summarizes the major laws, regulations, and policies that apply to the resources and proposals being analyzed in this plan amendment/EIS. (Appendix 2 describes in more detail the major resource programs and management guidance).

### **ENVIRONMENTAL MANAGEMENT**

In compliance with the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) regulations, BLM will prepare site-specific environmental reviews before implementing actions proposed in this RMP amendment/EIS. The environmental reviews will include "means to mitigate adverse environmental impacts" of the proposed action according to 40 CFR 1502.16(h). The environmental reviews provide site-specific assessments of the impacts of implementing these actions. As suitable, these reviews are documented in the following:

- Determination of NEPA adequacy.
- Categorical exclusion reviews.
- Environmental assessments and decision records or EIS' and records of decision.

In addition, BLM will ensure that the environmental review process includes evaluation of all critical elements, including cultural resources and threatened and endangered species, and completes required State Historic Preservation Office (SHPO) and U.S. Fish and Wildlife Service Section 7 consultations. The review also determines the mitigation needed to reduce or eliminate the adverse impacts of implementing a proposed action. All environmental documents are open to public review at the Tucson Field Office.

### **LAS CIENEGAS NATIONAL CONSERVATION AREA ACT**

Las Cienegas NCA and Sonoita Valley Acquisition Planning District were designated by Congress and signed into law by the President on December 6, 2000. Appendix 1 includes the text of Public Law 106-538.

Las Cienegas NCA was designated "to conserve, protect, and enhance for the benefit and enjoyment of present and future generations the unique and nationally important aquatic, wildlife, vegetative, archaeological, paleontological, scientific, cave, cultural, historical, recreational, educational, scenic, rangeland, and riparian resources and values of the public lands described in subsection (b) while allowing livestock grazing and recreation to continue in appropriate areas."

The Act requires BLM to prepare a management plan for the NCA within two years of the area's designation. The law acknowledges the effort that went into the preparation of this plan and the collaborative planning process by requiring that BLM prepare the NCA's management plan from a draft of the Empire-Cienega Management Plan and according to the goals and objectives developed by the Sonoita Valley Planning Partnership (SVPP).

**Table 2-1  
Laws and Regulations Relating to the Las Cienegas Resource Management Plan**

<b>Law/Regulation</b>	<b>Applies To</b>
American Indian Religious Freedom Act (AIRFA) 42 USC @ @1996	Native American religious places and access
Archeological Resources Protection Act (ARPA) 16 USC @ @470	Archaeological resources
Clean Air Act (CAA) of 1970, as amended 1990 42 USC @ @7401 et seq.	Air quality
Clean Water Act (CWA), as amended 33 USC @1252 et seq.	Surface water quality
Endangered Species Act (ESA) 16 USC @ @1531 et seq., as amended	Threatened and endangered species
Federal Land Exchange Facilitation Act of 1988 (FLEFA), 43 USC @1716, @1740	Federal land exchanges
Federal Land Policy and Management Act (FLPMA), 43 USV @1701	Federal lands, special management areas
Federal Noxious Weed Act of 1974, as amended	Noxious weeds
Federal Pollution Control Act, as amended 1972	Watersheds
Land and Water Conservation Fund Act of 1965	Outdoor recreation
Mining and Mineral Policy Act of 1970	Mining
Mining Law of 1872, as amended	Mining claims
National Environmental Policy Act (NEPA) 42 USC @ @4321 et seq., as amended	Federal undertakings
National Historic Preservation Act (NHPA)	Archaeological and historic properties
National Materials and Minerals Policy Research Development Act of 1980	Mineral resources
Public Rangelands Improvements Act of 1978	Rangeland and wildlife management
Resource Conservation and Recovery Act of 1986, as amended (RCRA)	Hazardous or solid waste
Sikes Act	Fish and wildlife management
Soil Conservation and Domestic Allotment Act of 1935	Watersheds
Taylor Grazing Act of 1934	Livestock grazing
Water Quality Act of 1987	Riparian areas, wetlands
Watershed Protection and Flood Control Act of 1954	Watersheds
Wild and Scenic Rivers Act (WSRA) 16 USC @1271 et seq.	Wild and scenic rivers
Secretary of the Interior Order 3175	Indian trust assets
Executive Order 11593	Preservation of the cultural environment
Executive Order 11988	Floodplain management
Executive Order 11990	Wetlands, riparian zones



**Table 2-1, continued  
Laws and Regulations Relating to the Las Cienegas Resource Management Plan**

<b>Law/Regulation</b>	<b>Applies to</b>
Executive Order 12898	Environmental justice
Executive Order 13007	Sacred sites
Executive Order 13112	Invasive species

This proposed Las Cienegas Resource Management Plan has incorporated the draft Empire-Cienega plan. The goals and objectives developed by SVPP are the foundation for this plan and are described in detail in the Desired Future Conditions section below. Achieving the goals and objectives supports the conservation, protection and enhancement of the NCA’s resources and the uses they support. The goals and objectives are also intended to meet or exceed the standards required in the BLM’s Standards and Guidelines for Rangeland Health in Arizona.

Because of the timing of the NCA designation which came when the draft plan was being prepared for publication, some proposed actions in some alternatives in the Draft Las Cienegas RMP/DEIS may be in conflict with the provisions of the Las Cienegas NCA Act. In preparing the proposed RMP/FEIS, we have noted in highlighted text where these conflicts occurred.

## **DESIRED FUTURE CONDITIONS**

The Sonoita Valley Planning Partnership developed a vision, goals, and resource objectives for the Sonoita Valley area (roughly the Upper Cienega Creek basin and small portions of the Upper Babocomari and Sonoita Creek basins) to be incorporated into planning efforts for the valley. As a participant in the

planning partnership, BLM’s Tucson Field Office has incorporated the vision, goals, and objectives as the foundation for the Las Cienegas Resource Management Plan. The Tucson Field Office has also designed each action alternative to achieve or maintain these future conditions by meeting resource objectives.

## **PLANNING AREA VISION AND GOALS**

### **Vision Statement of the Sonoita Valley Planning Partnership**

*The Sonoita Valley Planning Partnership will work together to perpetuate naturally functioning ecosystems while preserving the rural, grassland character of the Sonoita Valley for future generations.*

### **Goals for the Sonoita Valley (Upper Cienega Creek Watershed)**

1. Maintain and improve watershed health.
2. Maintain and improve native wildlife habitats and populations.
3. Maintain and restore native plant diversity and abundance.
4. Protect water quality.

5. Protect water quantity.
6. Assure sustainability and a complementary relationship of mineral resources to the protection of water quality and quantity.
7. Maintain the region's scenic beauty and open spaces.
  - a. Protect the Empire-Cienega Resource Conservation Area and the integrity of public lands in the Sonoita Valley.
  - b. Maintain the character of the Empire-Cienega Resource Conservation Area by limiting the building of any new roads or structures; maintaining the existing road system in its primitive character and condition; using existing road conditions to help control speed while providing sufficient recreational opportunities.
  - c. Alter or upgrade existing roads where needed to protect natural resources on public lands in the Sonoita Valley.
  - d. Encourage interaction and cooperation with other agencies and land owners, including acquiring land to protect and enhance the region's scenic beauty.
8. Sustain compatible traditional, current, and future use of the land.
  - a. Ensure a range of outdoor recreation opportunities that will protect natural resources on all public lands in the Sonoita Valley.
  - b. Develop and implement an education program to disseminate user guidelines that encourage responsible use of the public lands in the Sonoita Valley.
9. Promote stewardship of the resources to accommodate current and future opportunities and demands.
  - a. Encourage working partnerships between BLM and other agencies, users, groups, and interests.
  - b. Develop maps, signs, and educational literature to promote user stewardship on public lands within the Sonoita Valley.
10. Manage the cultural resources in the planning area in a manner that provides for their preservation and protection and also avails selected properties for scientific, public, and sociocultural uses.
- c. Establish a Sonoita Valley trail system to promote dispersed recreation and minimize user conflicts.
- d. Plan, develop, and provide long-term stewardship of the Arizona Trail with community involvement. Priority should be given to developing alternative routes through the Empire-Cienega Planning Area from Oak Tree Canyon to Interstate Highway 10. Establish a primitive, non-motorized route for a diversity of users and provide outstanding opportunities for trail-based recreation.

**RESOURCE OBJECTIVES FOR THE SONOITA VALLEY (UPPER CIENEGA CREEK WATERSHED)**

**Desired Upland Vegetation Condition**

The upland vegetation structure of the Sonoita Valley is a dynamic mixed shrub savanna where the dominance of desirable native perennial

## Chapter 2: Desired Future Conditions

grasses is emphasized. Native trees, shrubs, and succulents are also a part of the natural community. The relative abundance of each species results from the interaction of soils, climate, disturbance regimes, and competition among plant species.

When vigorous, this vegetation provides a ground cover of living plants and organic matter. This ground cover encourages precipitation to infiltrate the soil and reduces evaporation of moisture from the soil surface. The vegetation stabilizes soils and limits erosion to natural levels. The mosaic of diverse plant communities favors the production of high-quality water, wildlife, livestock, fish habitats, recreation opportunities, and a refuge from urban settings.

### **Watershed and Upland Vegetation Objective**

*The watershed and upland vegetation objective covers the National Resources Conservation Service (NRCS) ecological sites within the Sonoita Valley (Major Land Resource Area D-41-3 Southern Arizona Semidesert Grassland, 12-16 inch precipitation zone; and D-41-1 Mexican Oak-Pine Woodland and Oak Savannah, 16-20 inch precipitation zone) (See Appendix 3).*

- a. *Desired Plant Communities--Maintain or achieve properly functioning upland condition and a high similarity index (> 50%, by weight ) to the historic climax plant community present on the site on 80% or more of the ecological sites in the Sonoita Valley by the year 2015.*
- b. *Desired Ground Cover--Maintain or achieve the following ground cover on 80% or more of the ecological sites in the Sonoita Valley by the year 2015: Within Major Land Resource Areas 41-1 and 41-3,*

*maintain or achieve ground cover in woodland communities in excess of 60% (<40% exposed soil surface), in grassland communities in excess of 70% (<30% exposed soil surface), and in shrubland communities in excess of 40% (<60% exposed soil surface).*

**Rationale:** The present plant community on an ecological site can be compared to the vegetation states that can exist on the site. One can compare existing to potential vegetation through a similarity index expressed as the percentage of the desired plant community present on the site. The similarity index to historic climax provides a measurement of change that has occurred and shows how climate and management have affected a site's plant community. For each site, the Natural Resources Conservation Service (NRCS) develops and maintains the ecological site descriptions which describe historic climax plant communities. BLM will determine the present vegetation condition from ecological site inventories using the Natural Resources Conservation Service (NRCS) ecological site descriptions in its *Range and Pasture Handbook* (NRCS 1997).

**Watershed Health:** Watershed health largely depends on vegetation community composition and vigor which affect hydrological relationships. Soil cover consists of plants, plant litter, gravel, and rock. Infiltration and runoff, soil structure, soil moisture, and aquifer recharge are properly balanced only when cover is sufficient.

**Rangeland Health:** The goals, objectives, and actions presented in this plan are intended to meet or exceed the standards required in the BLM's Standards and Guidelines for Rangeland Health in Arizona. BLM developed these standards and guidelines in consultation with Arizona's Resource Advisory Council and others.

## *Fish and Wildlife Management Objective*

The fundamentals of rangeland health combine the precepts of physical function and biological health with elements of law relating to water quality, plant and animal populations, and communities. These fundamentals give the direction for developing resource objectives and selecting proper management actions to meet these objectives. The Arizona standards and guidelines meet the requirements and intent of 43 Code of Federal Regulations, Subpart 4180 (Rangeland Health). These standards and guidelines are intended to clearly state BLM's policy and direction for public land users and for those responsible for managing the public lands and accountable for their condition. (See Appendix 2 for additional text on the BLM's Standards and Guidelines.)

Attempting to achieve the historic climax plant community **on** ecological sites should direct management actions toward maintaining or restoring the physical function and biological health of the rangeland ecosystem. Sustaining the ecological health and function of rangelands allows the maintenance, enhancement, or creation of future social and economic options. Actions selected must be realistic and physically and economically achievable.

### ***Upland Wildlife Habitat Sub-Objectives***

Upland Wildlife Habitat Sub-Objective A: On loamy bottom ecological sites, provide habitat for breeding grasshopper and wintering Baird's sparrows in the Sonoita basin by maintaining the following:

- An average of 6-8" grass height.
- Ground cover of live grasses and grass litter >75%.
- Less than 10% shrub canopy on two-thirds of the loamy bottom (swales) range sites that are sampled each year.

Upland Wildlife Habitat Sub-Objective B: On open grasslands and in draws in the semidesert grassland and oak savannah vegetation communities (e.g., loamy bottom swales, loamy hills, and limy slopes ecological sites) provide the following habitat components for pronghorn antelope fawning at key monitoring sites:

- Maintaining vegetation cover 10-18 inches high during the fawning season from the beginning of April through June each year in key fawning areas.
- Maintaining the presence of five or more species of grasses and shrubs in the vegetation communities.
- Limiting trees to no more than 5% of the total cover.
- Maintaining scattered trees greater than 12 feet tall in the habitat.
- Ensuring usable water within 1 mile of key fawning areas.

### **Riparian Vegetation Objective**

*Maintain or achieve properly functioning condition (PFC) and the potential natural vegetation community (PNC) (as described below) for 80% of the riparian areas in the Sonoita Valley.*

*On BLM lands within the Empire-Cienega Planning Area, the objective is to achieve and maintain PFC on 100% of the riparian areas by 2003~~5~~ and achieve and maintain PNC (as described below) on 95% of the riparian areas by 2010.*

### ***Riparian Potential Natural Community Descriptions:***

Cienegas (valley bottom streams)--Along Upper Cienega Creek, achieve and maintain a

## Chapter 2: Desired Future Conditions

vegetation community in cienegas with the following conditions:

- Ground cover and protective roots > 90% on upper and lower banks.
- Marsh habitat >50% of the total aquatic habitat in key cienega riparian segments.
- Vegetation community on lower banks dominated by rushes, sedges, deer grass, and willows (i.e., *Juncus*, *Scirpus*, *Eleocharis*, *Carex*, *Muhleburgia*, *Salix*).
- Upper banks and floodplain dominated by sacaton, yerba mansa, cottonwood, willow, and mesquite.

Cienegas (valley bottom ponds)--In the historic floodplain of Cienega Creek, achieve and maintain a vegetation community in valley bottom ponds with the following conditions:

- Ground cover > 90% on banks.
- Emergent vegetation covering 75% or more of the perimeter of the aquatic habitat.
- Vegetation community on banks dominated by rushes, sedges, deer grass, and willows (i.e., *Juncus*, *Scirpus*, *Eleocharis*, *Carex*, *Muhleburgia*, *Salix*).
- Adjacent vegetation dominated by sacaton, paspalum grass, and yerba mansa.

*Note: Dominated means that < 20% in aggregate of the plant community consists of other species (e.g., seep willow, Bermuda grass, tamarisk, knot grass, upland herbaceous annuals, or cattail).*

Deciduous Woody Riparian (riparian areas with perennial surface water)--Along Lower Cienega Creek (below Mattie Canyon), achieve and maintain the following:

- A tree community dominated by Goodding willow on lower banks or in aquatic habitat.
- Trees on upper banks to include yew willow, Fremont cottonwood, velvet ash, and Arizona black walnut.
- A good mix of all age classes of riparian trees.
- Lower banks to be dominated by rushes, sedges, seedling riparian trees, and deer grass with bank cover exceeding 90%.
- Upper banks to be dominated by deer grass, sacaton grass, and riparian trees of sapling and adult age classes.

Deciduous woody riparian (riparian areas with free subsurface water)--Maintain a tree community composed of any of the following tree species according to the existing site's potential: Goodding willow, yew willow, Arizona black walnut, Fremont cottonwood, sycamore, seep willow, alder, box elder, and velvet ash. In addition, lower banks will be dominated by rushes, sedges, seedling riparian trees, and deer grass. If tamarisk is present, it is only a minor component of the riparian tree community.

**Rationale:** Properly Functioning Riparian Areas. Riparian health can be defined if the site capability and potential of a given riparian area are generally known (usually by locating and describing relatively pristine reference areas). Departure from this potential shows that the system is at risk of becoming further degraded or dysfunctional.

The riparian objective for BLM-managed lands is consistent with Standard 2 of Arizona Standards and Guidelines for Rangeland Health (See Appendix 2). Standard 2 requires that riparian-wetland areas be in properly functioning condition. Proper functioning condition of riparian and wetland areas is determined using the methodology described in the BLM's Riparian Area Management Technical Reference 1737-9, *Process for Assessing Proper Functioning Condition* (BLM 1995). The assessment evaluates presence or absence of the hydrologic, vegetation, and soil erosion/deposition factors that contribute to riparian area function (See Appendix 2).

The Cienega Creek riparian system is relatively stable, unlike canyon-bound streams with limited floodplain function. The objective of achieving and maintaining potential natural community for 95% of the riparian areas takes into account disturbances from natural events such as floods or fires which may impact portions of the riparian area, returning them temporarily to an earlier successional stage. Recovery of the riparian area to the potential natural community has been observed to occur fairly rapidly.

### **Aquatic Habitat Objective**

*Provide a diversity and high quality of aquatic habitats to maintain and enhance the viability of the existing native fish community and other aquatic species within the Cienega Creek portion of the Sonoita Valley ecosystem by meeting or exceeding values for aquatic habitat parameters shown in Table 2-2 within key segments by 2010 or within 3 years after a major flood.*

**Rationale:** Lack of pools is often a limiting factor in degraded riparian systems. Excessive sediment loads, coupled with a poor differential in scour and deposition, may prevent or inhibit

pool formation and development (Rosgen 1996). The development of a diversity of habitats that creates a wide array of physical attributes is expected to provide habitat for all life stages of each of the three fish species. Some locations along the creek have small areas of floodplain and streambank sheet or gully erosion. Sedimentation is likely to be a continual problem until the stream has adjusted in areas that are recovering from past entrenchment. The major sediment source in these areas is from sloughing banks as a new floodplain is established within the steep walled gully (stream adjustment to release itself from confinement due to entrenchment).

The fish with the most specific habitat requirements is the Gila chub. Overall, aquatic habitat diversity and stability are expected to increase if riparian and aquatic parameters listed above are met. Habitat parameters were selected to promote the health of this fish. Since the Gila topminnow and longfin dace also depend on pools and will benefit from the improvement of other parameters, all three fish species are expected to maintain healthy populations.

If the above objective is met, both juveniles and adult life stages of all three species are expected to be well represented in this fish community. In addition, all three segments are expected to maintain an average density exceeding 20 chub per 100 ft<sup>2</sup> of deep pool (> 2 ft deep) electrofished. Evidence of three distinct age classes will be interpreted as successful life recruitment into the adult age class. Habitat requirements of the fish have been studied the most thoroughly. But if habitat parameters for fish are met, then other aquatic species are also likely to benefit including two leopard frog species, Mexican garter snake, Sonoran mud turtle, two species of kingfishers, snipe, and several duck species.

**Table 2-2  
Pool Habitat and Cover Requirements for Selected Segments in Cienega Creek**

Segment Name	Minimum Pool Features			Minimum Instream Cover (ft <sup>2</sup> /mile)	Minimum Overhanging Cover (ft <sup>2</sup> /mile)	Minimum Monthly Flow (cfs)
	Total Number per mile	Number >2' Deep	Areal Extent (%)			
Source → Springwater Canyon	70	40	35	10,000	4,000	0.2 (June)
Springwater Canyon → Coldwater Spring	100	40	50	4,000	4,000	Unknown
Coldwater Spring → Confluence Mattie Canyon	N/A	N/A	80	4,000	4,000	Unknown
Confluence Mattie → Canyon Pump Canyon	100	40	50	4,000	4,000	0.7 (June)
Pump Canyon → Narrows	100	40	50	4,000	4,000	Unknown



*High quality aquatic habitat in Cienega Creek*

### **Fish and Wildlife Management Objective**

*Restore and maintain the native diversity, natural distribution, and abundance of fish and wildlife species in the Sonoita Valley, with sufficient resources and in a manner that perpetuates naturally functioning ecosystem processes by the following:*

- *Allowing for a mosaic of habitats.*
- *Minimizing habitat fragmentation.*
- *Allowing for waters appropriate to ecosystem capacity.*
- *Minimizing restrictions to movement.*
- *Reestablishing, extending the range, or supplementing populations.*
- *Implementing recovery plans.*
- *Supporting research efforts.*

**Rationale:** Achieving the upland and riparian vegetation objectives should produce vegetation states similar to the historic climax communities by creating a mosaic of habitat types for wildlife. Table 2-3 cross-references the rangeland ecological sites in the desired states to wildlife habitats (Brown 1982).

### **Cultural Resources Management Objective**

*Manage the planning area's cultural resources to realize or protect their scientific information potential, their educational, recreational and*

*traditional values, their usefulness as subjects for experimental studies, and their qualities requiring conservation for the future. To meet this objective, the planning area's cultural resources will be allocated among six established use categories:*

- . *Scientific Use*
- . *Conservation Use*
- . *Traditional Use*
- . *Public Use*
- . *Experimental Use*
- . *Discharged From Management*

**Rationale:** Compliance with the National Historic Preservation Act established BLM policy requires management of the planning area's cultural resources in a manner providing for:

- . *Collection and assimilation of information about the nature of the cultural resources known and expected to occur within the field area.*
- . *Assessment of cultural resource use potentials.*
- . *Assignment of resource uses.*
- . *Planned steps to protect or realize assigned uses.*
- . *Authorization of appropriate uses.*

(See Appendix 2 for a more detailed description of Cultural Resource Use Categories.)



**Table 2-3  
Vegetation Communities and Associated Wildlife Species, Empire-Cienega Planning Area**

<b>MLRA</b>	<b>Ecological Site</b>	<b>Brown &amp; Lowe Vegetation Community<sup>1</sup></b>	<b>Visual Aspect of the Historic Climax Plant Community</b>	<b>Associated Wildlife Species</b>
<b>41-3 Southern Arizona Semidesert Grassland</b>	Sandy Loam Upland; Loamy Upland; Swales; Limy Slopes; Volcanic Hills; Volcanic Hills/Limy Slopes; Loamy Upland-Swales; Sandy Loam Upland/Loamy Upland; Loamy Upland/Limy Slopes	143.1 Semidesert Grassland	Open Grassland	Baird's sparrow, grasshopper sparrow, scaled quail, aplomado falcon, pronghorn
	Loamy Hills; Loamy Hills/Limy Slopes; Volcanic Hills/Shallow Upland/Clay Hills	143.1	Grassland- Shrub Dotted	Baird's sparrow, grasshopper sparrow, scaled quail, aplomado falcon, lesser long- nosed bat, javelina, pronghorn
	Limestone Hills; Basalt	143.1	Shrub-Grassland	Mule deer, javelina
	Limestone Hills/Limy Upland	143.1	Shrubland	Gambel's quail, javelina, jaguar
		123.31 Madrean Woodland  Altered	Oak Woodland  Mesquite invaded Grass	Turkey, Mearn's quail, jaguar, white-tail deer, mule deer  Mule deer, javelina, Swainsons hawk
<b>Riparian Plant Communities</b>	Loamy Bottom (Woodland)	223.231 Mesquite Bosque	Mesquite Woodland	Gray hawk (in assoc. with cottonwood willow), white-tail deer, javelina
	Sandy-Bottom	243.32 Xero-riparian	Savannah	Gambel's quail, Mearn's quail, mule deer, javelina, jaguar
	Loamy Bottom Subirrigated	143.141 Sacaton Grassland	Open Grassland	Botteri's sparrow, Mearn's quail, black-tailed prairie dog, white-tail deer, javelina

**Table 2-3, continued**  
**Vegetation Communities and Associated Wildlife Species, Empire-Cienega Planning Area**

<b>MLRA</b>	<b>Ecological Site</b>	<b>Brown &amp; Lowe Vegetation Community<sup>1</sup></b>	<b>Visual Aspect of the Historic Climax Plant Community</b>	<b>Associated Wildlife Species</b>
<b>Riparian Plant Communities (continued)</b>	Sandy Bottom-Subirrigated	223.211 Southwest Riparian Deciduous Forest	Cottonwood-Willow Forest	Fish, lowland and Chiricahua leopard frogs, Mexican garter snake, yellow-billed cuckoo, southwest willow flycatcher, gray hawk, beaver, white-tail deer
	No associated ecological site	243.321 Southwest Interior Marshland	Cienega	Fish, lowland and Chiricahua leopard frogs, Mexican garter snake
	Loamy Bottom		Cut Mesquite Bosque	
	Loamy Bottom-Subirrigated		Agricultural Field	

<sup>1</sup> Brown (1982).

**Cultural Resources Sub-Objective**

Cultural Resource Sub-Objective A: Empire Ranch Headquarters

Preserve and adaptively reuse the Empire Ranch Headquarters for public benefit without diminishing the historically significant buildings and setting by doing the following:

- Evaluating and nominating structures and buildings for eligibility to the National Register of Historic Places.
- Stabilizing and maintaining historic structures in accordance with the Secretary of the Interior’s Standards and Guidelines for Rehabilitating Historic Buildings on the National Register.
- Designing and implementing adaptive uses of the Headquarters for an array of compatible

*educational, research, interpretive and administrative programs.*

- Continuing the traditional use of the Headquarters to support management of the surrounding lands.
- Maintaining the Headquarters development and usage at levels compatible with maintaining desired resource conditions for the surrounding lands.

**Recreation Objective**

Ensure a range of outdoor recreation opportunities to help meet existing and expected needs while protecting natural resources on all public lands in the Empire-Cienega Planning Area by doing the following:

## Chapter 2: Description of Alternatives

- *Establishing recreation opportunity zones and management standards that will enhance the spectrum of activities and settings.*
- *Developing and implementing a visitor education program to encourage responsible use of public lands in the Empire-Cienega Planning Area.*
- *Establishing an Empire-Cienega trail system as part of the Sonoita Valley trail system to allow motorized and non-motorized dispersed recreation.*
- *Maintaining and securing legal access to the Empire-Cienega portion of the Sonoita Valley trail system.*

### DESCRIPTION OF ALTERNATIVES

The alternatives section in this plan is divided into two parts, to differentiate the two levels of BLM planning and decision making which are occurring. The main purposes for this division are: (1) to clearly distinguish decisions (i.e., land use plan proposals) that would likely require land use plan amendments to change them, and (2) to clearly distinguish the land use plan proposals from the activity plan actions because each is subject to different public review and protest/appeal procedures. The Bureau's planning process includes an opportunity for administrative review of Land Use Plans via a plan protest to the BLM State Director following the issuance of the Final Plan. Plan decisions may be appealed following the issuance of the Record of Decision for the Final Plan/EIS. Activity plan actions may also be appealed following the issuance of the decision document.

**The alternatives section in this plan is divided into two parts.** The first part of the alternatives

section includes the four land use plan alternatives for which BLM has proposed decisions at the Resource Management Plan level, including desired resource conditions, land use allocations, and special designations, and land tenure. Within each alternative, we have arranged the proposed actions by resource topic. Table 2-4 compares the proposals for each land use plan alternative, summarizes the changes among the alternatives for the RMP-level proposals.

The second part includes the proposed implementation for each alternative and consists of four integrated activity plans, one for each land use plan alternative. Table 2-5 summarizes the changes across alternatives for the activity plan proposals. The integrated activity plans incorporate The second part describes the resource management actions which would be implemented under each alternative. Table 2-5 compares the management actions across alternatives. The management actions include many that would have traditionally been found in allotment management plans (AMPs), habitat management plans (HMPs), cultural resource management plans, recreation plans, and area of critical environmental concern (ACEC) management plans.

### INTERMIXED LANDS

The presence of intermixed land ownership patterns within the planning area complicates the development and implementation of alternative management strategies. The proposals under each of the alternatives in this plan are intended to apply only to BLM-managed public lands. The exceptions are vegetation treatments and livestock grazing management actions which are also proposed on State Trust Lands on the Empire-Cienega and Empirita allotments since BLM holds the state grazing leases on these allotments.

**Table 2-4  
Comparison of Land Use Plan Alternatives in the Las Cienegas Resource Management Plan**

<b>DESIRED RESOURCE CONDITIONS</b>				
<b>Planning Issue</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Watershed: Upland, Riparian and Aquatic Management</b>	Manage public lands to achieve and maintain Arizona Standards for Rangeland Health.	In addition, manage public lands to achieve and maintain the goals and desired resource objectives for upland vegetation, riparian vegetation, and aquatic habitats developed through the Sonoita Valley Planning Partnership.	Same as Alternative 2.	Same as Alternative 2.
<b>Fish and Wildlife Management</b>	Four T&E species and two candidate species selected for priority management.	Manage public lands to achieve and maintain the goals and desired resource objectives for fish and wildlife developed through the Sonoita Valley Planning Partnership  Emphasis on ecosystem approach to management of four rare habitats (e.g., grassland, riparian/wetland, mesquite bosque, oak woodland) which support four T&E species, two candidate species, and 11 priority species.	Same as Alternative 2.	Same as Alternative 2.
<b>Visual Resource Management</b>	BLM would designate 49,000 acres as VRM Class III.	BLM would designate 49,000 acres as VRM Class II.	Same as Alternative 2.	Same as Alternative 2.

**Table 2-4, continued**  
**Comparison of Land Use Plan Alternatives in the Las Cienegas Resource Management Plan**

<b>DESIRED RESOURCE CONDITIONS, continued</b>				
<b>Planning Issue</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Cultural Resource Management</b>	Manage the historically significant buildings at the Empire Ranch Headquarters for Public Use.	Manage public lands to achieve and maintain the goals and desired resource objective for cultural resources developed through the Sonoita Valley Planning Partnership	Same as Alternative 2.	Same as Alternative 2.
	Manage selected cultural properties outside the ranch headquarters area for scientific and conservation use. As data are collected, some properties and sites could be allocated to public or experimental use, or discharged from management.	Manage selected cultural properties outside the ranch headquarters area for scientific, conservation, and public use. As data are collected some properties and sites could be allocated to public or experimental use or discharged from management.		
	Work with Native Americans to select harvesting areas for the noncommercial collection of indigenous plants.	Work with Native Americans to select harvesting areas for the noncommercial collection of indigenous plants.		
<b>Recreation Management</b>	No desired recreation opportunity classes established.	Three desired recreation opportunity classes established.	Same as Alternative 2.	Same as Alternative 2.

**Table 2-4, continued**  
**Comparison of Land Use Plan Alternatives in the Las Cienegas Resource Management Plan**

<b>LAND USE ALLOCATIONS</b>				
<b>Planning Issue</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Fish and Wildlife Habitat Management</b>	Manage suitable public land habitats for the recovery or reestablishment of native populations. Reintroduce endangered Gila Topminnow in accord with AGFD-BLM MOU.	Same as Alternative 1 except that reintroductions, <del>range extensions;</del> <b>reestablishments</b> , or supplementing federally listed, candidate or other priority species would be pursued in suitable habitats.	Same as Alternative 2.	Same as Alternative 2.
<b>Wildland Fire Management</b>	All natural or human caused wildland fires would be suppressed <b>in the wildland-urban interface areas, a multi-agency management strategy that incorporates ecological and administrative issues will be developed for areas outside the wildland-urban interface areas.</b>  Unplanned ignitions would not be managed for resource benefit.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
<b>Mining</b>	48,542 acres of public lands remain closed to mineral location and mineral leasing. 458 acres of public lands and <del>5914.6</del> <b>7,167</b> acres of split-estate lands remain open to mineral location and mineral leasing. 49,000 acres of public lands and <del>5914.6</del> <b>7,167</b> acres of split-estate lands closed to mineral material sales (See Map 2-1 ).	Same as Alternative 1 except petition to withdraw 458 public domain acres and <del>5914.6</del> <b>7,167</b> split-estate acres from mineral location and leasing (See Map 2-4 ).	41,000 acres of public land and <del>5914.6</del> <b>7,167</b> acres of split-estate lands would be open to mineral location and mineral material sales outside of ACEC's. 45,859 acres of public lands and <del>5914.6</del> <b>7,167</b> acres of split-estate lands would be open to mineral leasing with the stipulation of no surface occupancy within ACEC's (See Map 2-11 ).	Same as Alternative 2 (See Map 2-4).

**Table 2-4, continued**  
**Comparison of Land Use Plan Alternatives in the Las Cienegas Resource Management Plan**

<b>LAND USE ALLOCATIONS, continued</b>				
<b>Planning Issue</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Major Utility Rights-of-Way</b>	BLM would not designate utility corridors.	BLM would designate two utility corridors across public lands in the planning area (See Map 2-5).	BLM would designate three utility corridors across public lands in the planning area (See Map 2-12).	BLM would designate one utility corridor across public lands in the planning area (See Map 2-17).
<b>Off-Highway Vehicle (OHV) Designation</b>	OHV use on 49,000 acres of public land would be limited to designated roads.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
<b>Public Land Road Designations</b>	<del>116.4</del> <b>113.2</b> miles--open-motorized travel <del>0.4</del> <b>0.4</b> miles--new construction 0 miles--seasonal use <del>20.3</del> <b>21.1</b> miles--administrative use 0 miles--non-motorized use <del>2.2</del> <b>1.2</b> miles--closed and reclaimed (See Map 2-2).	<del>93.9</del> <b>91.9</b> miles--open-motorized travel <del>0.4</del> <b>0.4</b> miles--new construction <del>4.0</del> <b>0.7</b> miles--open-seasonal use <del>27.0</del> <b>28.7</b> miles--administrative use 6.6 miles--non-motorized use <del>16.0</del> <b>13.7</b> miles--closed and reclaimed (See Map 2-6).	<del>94.2</del> <b>89.0</b> miles--open-motorized travel <del>0.4</del> <b>0.4</b> miles--new construction <del>5.9</del> <b>4.4</b> miles--open-seasonal use <del>25.4</del> <b>30.5</b> miles--administrative use <del>7.6</del> <b>6.8</b> miles--non-motorized use <del>11.4</del> <b>9.8</b> miles--closed and reclaimed (See Map 2-13).	<del>86.8</del> <b>83.9</b> miles--open-motorized travel <del>0.4</del> <b>0.4</b> miles--new construction <del>4.1</del> <b>0.9</b> miles--open-seasonal use <del>28.5</del> <b>30.2</b> miles--administrative use 0 miles--non-motorized use <del>27.6</del> <b>25.5</b> miles--closed and reclaimed (See Map 2-18).
<b>Recreation Management</b>	BLM would not designate recreation zones.	BLM would designate 1,109 acres as Recreation Zone 1; 3,504 acres as Recreation Zone 2; and the 44,387 remaining acres as Recreation Zone 3 (See Map 2-7).	BLM would designate 1,109 acres as Recreation Zone 1; 16,851 acres as Recreation Zone 2; and the 31,040 remaining acres as Recreation Zone 3 (See Map 2-14).	BLM would designate 1,109 acres as Recreation Zone 1; 2,161 acres as Recreation Zone 2; and the 45,730 remaining acres as Recreation Zone 3 (See Map 2-19).

**Table 2-4, continued**  
**Comparison of Land Use Plan Alternatives in the Las Cienegas Resource Management Plan**

<b>LAND USE ALLOCATIONS, continued</b>				
<b>Planning Issue</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Arizona Trail</b>	BLM would not designate a corridor for the Arizona Trail..	BLM would designate a corridor for the Arizona Trail across 11.6 miles of public lands (See Map 2-6).	BLM would designate a corridor for the Arizona Trail across 14 miles of public land (See Map 2-15).	BLM would designate a corridor for the Arizona Trail across 8 miles of public land (See Map 2-20).
<b>Livestock Grazing Management</b>	BLM would allocate 8448 Animal Unit Months (AUMs) of forage Authorized on about 41,855 <sup>1</sup> public land acres within 4 allotments (See Map 2-3 ).	BLM would allocate up to 10,524 <sup>2</sup> Animal Unit Months (AUMs) of forage Authorized on about 42,155 <sup>3</sup> public land acres within 5 allotments (See Map 2-9 ).	BLM would allocate 5880 Animal Unit Months (AUMs) of forage Authorized on about 43,895 45,375 <sup>4</sup> public land acres within 5 allotments (See Map 2-9 ).	No public lands would be allocated for livestock grazing and BLM would not allocate forage for livestock grazing.
<b>SPECIAL DESIGNATION AREAS</b>				
<b>Planning Issue</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>ACEC Designation</b>	No ACECs designated.	One ACEC designated on 45,859 acres of public land (See Map 2-10).	Two ACECs designated on 45,859 acres of public land (See Map 2-16).	Same as Alternative 2 (See Map 2-10).
<b>Wild and Scenic Rivers</b>	Manage the Cienega Creek Wild and Scenic Rivers Study Area to protect the resources pending congressional action on designation.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
<sup>1</sup> There are about 659 acres currently excluded from grazing, primarily for livestock management purposes. <sup>2</sup> The actual number of AUMs of forage used annually would vary due to the flexible stocking in association with the Biological Planning Process described in the Livestock Management Actions for Alternative 2. <sup>3</sup> There are about 3,900 acres proposed as livestock enclosures for both livestock management and monitoring purposes under Alternative 2. The exact number of excluded areas may vary depending on the number, size, and location of study enclosures which will be developed to help evaluate the effectiveness of grazing management. <sup>4</sup> There would be about 699 acres excluded from grazing under Alternative 3.				



Table 2-4, continued  
 Comparison of Land Use Plan Alternatives in the Las Cienegas Resource Management Plan

<b>LAND TENURE</b>				
<b>Planning Issue</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Land Tenure Adjustments</b>	Public lands in the planning area (Empire-Cienega Long Term Management Area) to be retained and blocked up through acquisitions of lands or easements according to objectives and management prescriptions in the Safford RMP Land Tenure Plan Amendment.	Public lands in Las Cienegas NCA to be retained and additional public lands or easements to be acquired within the Sonoita Valley Acquisition Planning District according to the prescriptions in the Las Cienegas RMP/EIS Acquisition Strategy (Appendix 2). Public lands which become contiguous with the NCA due to acquisitions of intermixed lands become part of the NCA. Acquisitions within the Sonoita Valley Acquisition Planning District become part of the NCA upon acquisition.  Any acquisitions of lands or easements inside the planning area (Empire-Cienega Long Term Management Area) but outside the Sonoita Valley Acquisition Planning District would be completed according to objectives and management prescriptions in the Safford RMP Land Tenure Plan Amendment.	Same as Alternative 2.	Same as Alternative 2.

**Table 2-5**  
**Comparison of Alternatives— Activity Plan Level Management Actions**  
**Las Cienegas Resource Management Plan (This first page of table was missing in Draft Plan.)**

<b>Implementation Issue and Associated Management Actions</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Watershed: Upland, Riparian and Aquatic Management</b>				
Vegetation Treatments	Case by Case	On 20,000 Acres (See Map 2-23)	Same as Alternative 2	Same as Alternative 2
Site Restoration	Case by Case	Where Impacting Watershed/Riparian Function	Same as Alternative 2	Same as Alternative 2
Non-Commercial Plant Collection	Casual use	by permit <b>Yes, up to 20 lbs. Per Person Per Year of Seeds, Nuts and Fruits.</b>	Same as Alternative 2	Same as Alternative 2
Establish Weed Management Area	No	Yes	Yes	Yes
Control Non-Native Plants	Case by Case	Where Impacting Natives and Feasible	Same as Alternative 2	Same as Alternative 2
Implement Wood Canyon Activity Plan	No	Yes	Yes	Yes
<b>Continue Agricultural Fields Restoration Project</b>	<b>Case by Case</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Motorized Vehicles and Special Recreation Permit Holders Restricted to Designated Stream Crossings	Partial	Yes	Yes	Yes
Prohibit Recreational Mining	No	Yes	Yes	Yes

**Table 2-5 continued**  
**Comparison of Alternatives— Activity Plan Level Management Actions**  
**Las Cienegas Resource Management Plan**

<b>Implementation Issue and Associated Management Actions</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Watershed: Upland, Riparian and Aquatic Management (continued)</b>				
Prohibit Camping Within 100 Feet of Stream	No	Yes	Yes	Yes
Minimize Developments in 100 Year Floodplain	Yes, Livestock	Yes, All	Yes	Yes
Manage Uses to Ensure that Stream Bank Stability is > 90%	No	Yes	Yes	Yes
Implement Design Changes on Roads	Case-by-Case	Where <b>Roads</b> Degrading Watershed or Riparian Function	Same as Alternative 2	Same as Alternative 2
Restrict Livestock Grazing in Riparian Areas to Crossing Lanes and Watering Areas	Partial	Yes	Yes	Yes
<b>Fish and Wildlife Management</b>				
Section 7 Consultations	Yes	Yes	Yes	Yes
Implement Existing Grazing Biological Opinions' Terms and Conditions for Gila Topminnow, Southwestern Willow Flycatcher, Jaguar, Lesser Long-Nosed Bat, Huachuca Water Umbel	Yes	Yes, These are Incorporated as Proposed Fish and Wildlife and Livestock Grazing Management Actions	Same as Alternative 2	Same as Alternative 2

**Table 2-5, continued.**  
**Comparison of Alternatives— Activity Plan Level Management Actions**  
**Las Cienegas Resource Management Plan**

<b>Implementation Issue and Associated Management Actions</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Fish and Wildlife Management (continued)</b>				
Implement Gila topminnow Recovery Plan	Partial	Yes, Instream Flow Application for Cienega Creek, Control Exotics, Establish Supplemental Populations, Minimize Creek Access and Crossings	Same as Alternative 2	Same as Alternative 2
Pursue Reintroductions, <del>range extensions</del> or Supplementation of Priority and Special Status Species into Suitable Habitats According to Established Procedures	For Gila Topminnow Only, in Accord With Existing BLM-AGFD MOU	Yes	Yes	Yes
Control Exotic Species	Case-by-Case	Where <b>Exotics</b> Threatening Natives and Control is Feasible	Same as Alternative 2	Same as Alternative 2
Complete Water Source Evaluation	Partial	Yes	Yes	Yes
Modify Fences	Case-by-Case	Yes (See Map 2-24)	Same as Alternative 2	Same as Alternative 2
Develop Partnership Educational Materials on Pronghorn	No	Yes	Yes	Yes
Not Authorize Dog Trials in Pronghorn Habitat from April to June	Yes	Yes (See Map 2-25)	Same as Alternative 2	Same as Alternative 2
Require Dogs to be Leashed in Pronghorn Fawning Areas from April to June	No	Yes (See Map 2-25)	Same as Alternative 2	Same as Alternative 2

**Table 2-5, continued.**  
**Comparison of Alternatives— Activity Plan Level Management Actions**  
**Las Cienegas Resource Management Plan**

<b>Implementation Issue and Associated Management Actions</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Fish and Wildlife Management (continued)</b>				
Pursue Conservation Easements or Acquisitions of Land to Maintain Movement Areas	No	Yes	Yes	Yes
Develop Supplemental Waters	Case-by-Case	Yes, If Found Necessary from Water Sources Evaluation	Same as Alternative 2	Same as Alternative 2
<b>Cultural Resource Management</b>				
Site Allocation	Empire Ranch Headquarters to Public Use	Empire Ranch Headquarters to Public Use	Same as Alternative 2	Same as Alternative 1
	No Other Sites to Public Use	Mattie Canyon, Sandford Homestead, Pump Canyon to Scientific use.		
Project Plans	Master Plan for Empire Ranch Headquarters Would Provide for Minimal Public Use and Stabilization, but Not Restoration of Historic Buildings	Master Plan for Empire Ranch Headquarters Would Provide for Stabilization, Restoration, and Adaptive Reuse of Historic Buildings, Including Historic House Museum, Interpretive Discovery Trail, and Education on Empire Program	Same as Alternative 2	Same as Alternative 2
National Register Nominations	Empire Ranch Headquarters	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Class II Surveys	On 40,000 Acres	On 40,000 Acres	On 40,000 Acres	Project-by-Project Basis

**Table 2-5, continued.**  
**Comparison of Alternatives— Activity Plan Level Management Actions**  
**Las Cienegas Resource Management Plan**

<b>Implementation Issue and Associated Management Actions</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Cultural Resource Management (continued)</b>				
Class III Surveys	Along 436.7 <b>113.2</b> Miles of Roads	Along 428.5 <b>91.9</b> Miles of Roads and Trails	Along 433.4 <b>89.0</b> Miles of Roads and Trails	Along 446.4 <b>83.9</b> Miles of Roads
<b>Access</b>				
Designated Road System	Yes	Yes	Yes	Yes
Pursue Legal Access	No	Yes (EC-900, EC-901, EC-902 and EC-904) (See Map 2-26)	Same as Alternative 2	Same as Alternative 2
Road Maintenance	Infrequent	Scheduled According to Maintenance Plan	Same as Alternative 2	Same as Alternative 2
Develop Transportation System Project Plan	No	Yes	Yes	Yes
<b>Livestock Grazing Management</b>				
Maximum Livestock Numbers on Allotment (All Land Status)	2,064	variable <b>2,120<sup>1</sup></b>	1,175	1,232
Allowable Utilization	40-60%	30-40%	30-40%	30-40%
Stocking Rate	Variable (Empire-Cienega) Set (Others)	Variable	Fixed	N/A

<sup>1</sup>The actual number of livestock would vary annually due to the flexible stocking in association with the Biological Planning Process described in the Livestock Grazing Management Actions for Alternative 2. Alternative 2 total livestock numbers includes an additional 15 on the Empirita public lands, 30 head in Empire Mountains public lands and 11 head on private lands in Empire Mountains compared to Alternative 1.

**Table 2-5, continued**  
**Comparison of Alternatives— Activity Plan Level Management Actions**  
**Las Cienegas Resource Management Plan**

<b>Implementation Issue and Associated Management Actions</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Livestock Grazing Management (continued)</b>				
Pasture Rotation	Selective Rest Rotation (Empire-Cienega) Deferred Rotation (Others)	Selective Rest Rotation	Seasonal Use (Vera Earl) Deferred Rotation (Others)	N/A
Proposed Range Improvements	19 Range Improvements: 21.5 Miles Fence 7.25 Miles Pipeline 4 New Wells 3 Redeveloped Wells 2 Corrals (See Map 2-22)	Same as Alternative 1, Plus Riparian Enclosures at Narrows and Nogales Springs (See Map 2-22)	Same as Alternative 2	110 Miles Fence
Biological Planning	Empire-Cienega Allotment	All Allotments	No Allotments	N/A
<b>Recreation Management</b>				
Issue Special Recreation Permits	Case-by-Case	Case-by-Case and According to Guidance for Recreation Zone	Same as Alternative 2	Same as Alternative 2
Pursue Special Land Use Permit with Arizona State Land Department	No	Yes	Yes	Yes
Pursue Recreation Permit System.	No	Yes	Yes	Yes
Develop Interpretive Program	No	Yes	Yes	Yes
Develop Maintenance Program	No	Yes	Yes	Yes

**Table 2-5, continued.**  
**Comparison of Alternatives— Activity Plan Level Management Actions**  
**Las Cienegas Resource Management Plan**

<b>Implementation Issue and Associated Management Actions</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Recreation Management ( continued)</b>				
Designated Group Sites	0	3 (See Map 2-28)	5 (See Map 2-29)	1 (See Map 2-30)
Designated Camp Areas	0	4 (See Map 2-28)	5 (See Map 2-29)	4 (See Map 2-30)
Day Use Areas	0	2	2	1
Designated Pullouts (Minimum#)	0	11	14	10
Group Size (Requires Special Recreation Permit When Meets or Exceeds This Number <sup>2</sup> )	50 Vehicles	30 or More People <b>Up to Maximum Group Size Allowed in Selected Staging Area</b>	Same as Alternative 2	Same as Alternative 2
<b>Mechanized Vehicles</b>	<b>On/Off Existing Roads/Trails</b>	<b>On Designated Roads/Trails</b>	<b>On/off designated roads/trails</b>	<b>On designated roads/trails</b>
<b>Designated Speed Limit</b>	<b>None</b>	<b>Not to Exceed 25mph Unless Otherwise Posted</b>	<b>Same as Alternative 2</b>	<b>Same as Alternative 2</b>

<sup>2</sup> Other conditions may warrant a special recreation permit, including commercial and competitive events.



Table 2-5, continued.  
**Comparison of Alternatives— Activity Plan Level Management Actions**  
**Las Cienegas Resource Management Plan**

<b>Implementation Issue and Associated Management Actions</b>	<b>Alternative 1 (Current Management)</b>	<b>Alternative 2 (Proposed)</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Mineral Materials</b>				
Defined Administrative Use	No	Yes, limited to <math>\frac{1}{2}</math> acre surface disturbance per project	Same as Alternative 2	Same as Alternative 2
Defined Casual Use	No	Yes, up to 1 cubic yard. <b>None allowed.</b>	Same as Alternative 2	Same as Alternative 2.
Defined Rock Collecting	No	Yes, 25 lbs/day , not to exceed 250 lbs/year.	Same as Alternative 2	Same as Alternative 2

Implementation of these proposals would be coordinated with the Arizona State Land Department.

In some instances proposals, particularly for linear features such as rights-of-ways and road and trail designations, cannot be effectively implemented on public lands without also being implemented on intermixed State Trust Lands. In these instances, the plan determines the need for coordination with the Arizona State Land Department to ensure that necessary rights-of-way or other land authorizations are obtained prior to implementation of the proposal.

## **THE PROPOSED LAS CIENEGAS NATIONAL CONSERVATION AREA**

~~As BLM was preparing this plan, Arizona Congressman Jim Kolbe introduced into Congress a bill (HR 2941) to designate the majority of the public lands within the Empire-Cienega Planning Area as the Las Cienegas National Conservation Area (NCA). The remaining public lands in the Empire-Cienega Planning Area were proposed for inclusion in the Sonoita Valley Acquisition Planning District. The Las Cienegas National Conservation Area and Sonoita Valley Acquisition Planning District were created when President Clinton signed the bill into law on December 6, 2000. Appendix 1 includes the text of Public Law 106-538.~~

~~The law requires BLM to prepare a management plan for the NCA within 2 years of the area's designation. The law acknowledges the effort that went into the preparation of this plan and the collaborative planning process by requiring that BLM prepare the NCA's management plan from a draft of the Empire-Cienega Management Plan and according to the goals and objectives developed by the Sonoita Valley Planning Partnership (SVPP).~~

~~This Proposed Las Cienegas Resource Management Plan has incorporated the draft Empire-Cienega plan. The goals and objectives developed by SVPP are the foundation for this plan and are described in detail in an earlier section of this Chapter. The alternatives in this plan are consistent with most of the provisions of the law establishing the Las Cienegas NCA. However, there are a few provisions, such as closing the public lands within the NCA to mineral entry, which are not consistent with one or more of the alternatives in this draft plan. Because of the timing of the law's passage, which occurred when the draft plan was nearly complete, we have not modified the draft plan and EIS to incorporate all provisions of the law. We will make those changes while preparing the final plan and EIS.~~

## **PART A--LAND USE PLAN ALTERNATIVES**

### **Alternative 1--No Action (Current Management)**

Alternative 1, the No Action Alternative, would continue current management. Current management has been ongoing under the interim management guidance for the Empire-Cienega Planning Area included in the Phoenix Resource Management Plan (BLM 1988) and the interim grazing plan (BLM 1995). The management goal for the area as stated in the interim management guidance is to "preserve, protect, and enhance the property's multiple use values. These values include an extensive riparian area, presence of an endangered species, outstanding small and big game habitat, magnificent open space, and potential for dispersed recreation activities such as hiking, horse-back riding, camping, and picnicking." Under current management, desired resource conditions include an emphasis on federally listed threatened and endangered fish and wildlife and

*Chapter 2: Part A—Land Use Alternatives*

significant cultural properties. Land use allocations are limited to continuing the existing livestock grazing leases and continued closure to mineral exploration and development of lands acquired before the enactment of the Federal Land Exchange Facilitation Act of 1988. Alternative 1 would not designate utility corridors, ACECs, recreation zones, or an Arizona Trail corridor. As the baseline against which other alternatives are compared, Alternative 1 is required by the National Environmental Policy Act (NEPA).

**Alternative 1--Land Use Plan Proposals**

***Desired Resource Conditions***

Under Alternative 1, BLM would do the following to meet desired resource conditions:

*Fish and Wildlife Management*

Give priority management emphasis to four threatened or endangered species (i.e., Gila topminnow, Southwestern willow flycatcher, lesser long-nosed bat, and Huachuca water umbel), one proposed threatened species (Chiricahua leopard frog), and one candidate species (Gila chub).

*Visual Resource Management*

Designate 49,000 acres of public land as visual resource management (VRM) Class 3 (See Appendix 2, Visual Resource Management Class Objectives).

*Cultural Resource Management*

Manage the historically significant buildings at the Empire Ranch Headquarters for public use. ***(Common to All Alternatives)***

Manage selected cultural properties outside the ranch headquarters area for scientific and conservation use. As data is collected, some properties and sites could be allocated to public or experimental use or discharged from management.

Work with Native Americans to select harvesting areas for noncommercial collection of indigenous plants.

***(Common to All Alternatives)***

*Recreation Management*

Not establish recreation opportunity classes.

***Land Use Allocations***

Under Alternative 1, BLM would make the following land use allocations:

*Fish and Wildlife Management*

Manage suitable public land habitats for the recovery or reestablishment of native populations in collaboration with federal and state agencies, user groups, and other interested parties. Provide for the reintroduction of Gila topminnow into suitable habitats in accord with the existing BLM-Arizona Game and Fish Department Memorandum of Understanding.

*Wildland Fire Management*

BLM will suppress all natural or human-caused wildland fires by first addressing safety concerns to firefighters and the public and then addressing resource concerns. Because of the planning area's small size, and the proximity of an increasing number of homes in the wildland-urban interface, BLM ~~has determined that it will not~~ manage unplanned ignitions for the benefit of resources **only once public safety and property protection can be assured and in conformance with the RMP. Due to intermixed land ownership patterns, BLM will pursue development of and utilize a multi-agency fire management strategy in the planning area which will consider both ecological and administrative issues.**

***(Common to All Alternatives)***

*Mineral Development*

Under Alternative 1, all of the planning area's 48,542 acres of acquired public lands would remain closed to locatable and leasable (fluid) mineral exploration and extraction. The 458

*Land Use Plan Proposals—Alternative 1 (Current Management)*

acres in the Empire Mountains--which are original public domain--and the lands with split-estate federal minerals (5,914.6 **7,167** acres) would remain open to locatable and leasable minerals exploration and extraction. The planning area's 49,000 acres of public lands and 5914.62 **7,167** acres of spit-estate lands would remain closed to mineral material sales (i.e., salable minerals)(See Map 2-1).

Utility Corridors

Not designate utility corridors.

**Land Use Permits**

and--Continue to process on a case-by-case basis utility rights-of-ways and other land use authorizations.

Off-Highway Vehicle Management

Continue to limit vehicles to the existing road network pending full implementation of a designated road system on 49,000 acres of public land. The existing road system includes ~~116.4~~ **113.2** miles of open roads on public lands. Under current management a few roads are restricted or closed for resource or safety reasons, including ~~20.3~~ **21.1** miles of administrative use roads and ~~2.2~~ **1.2** miles of closed roads. **One new road of about 0.4 miles would be constructed as a bypass route at the Empire Ranch Headquarters** (See Map 2-2).

Arizona Trail

Not designate a corridor for the Arizona Trail.

Recreation Management

Not establish recreation zones.

Livestock Grazing Management

Continue to ~~authorize~~ **allocate 9,984 AUMs of forage for** livestock grazing on the public lands on the Empire-Cienega, Empirita, Rose Tree,

and Vera Earl allotments (See Table 2-6), but not allocate ~~acreage~~ **forage** for livestock grazing on the 2,480 acres of public lands in the Empire Mountains (See Map 2-3).

The Activity Plan Proposal Management

**Actions** section for Alternative 1 includes detailed narratives of livestock grazing management for each of the planning area's grazing allotments. These narratives discuss grazing strategies, **livestock numbers** initial ~~allocations~~, and proposed range improvements.

**Special Designation Areas**

Under Alternative 1, BLM would do the following:

Areas of Critical Environmental Concern

Not designate additional areas of critical environmental concern.

Wild and Scenic Rivers

Continue to manage the Cienega Creek Wild and Scenic Rivers Study Area to protect the resources pending congressional action on designation.

*(Common to All Alternatives)*

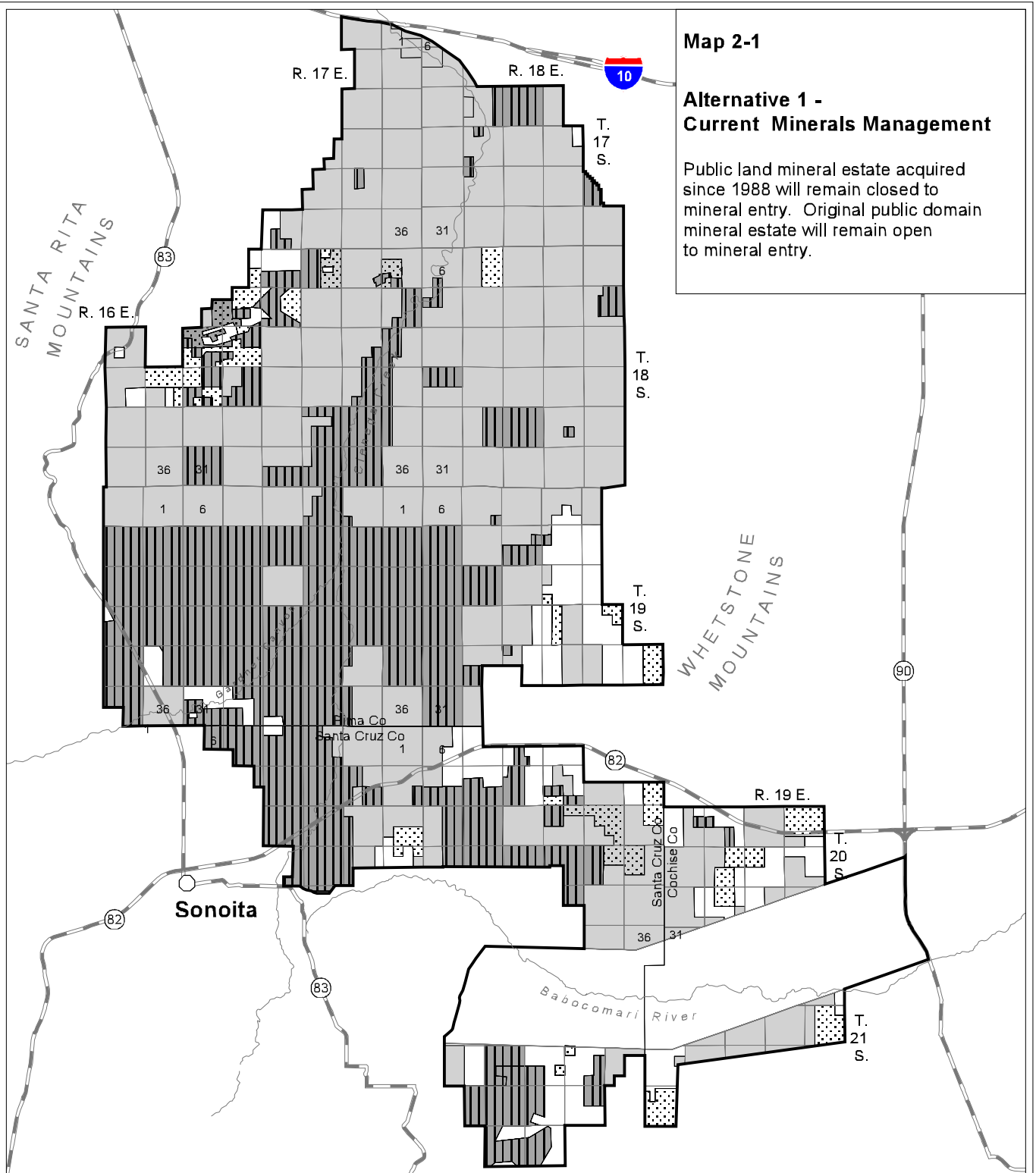
**Land Tenure**

**Public lands in the planning area (Empire-Cienega Long-Term Management Area) to be retained and blocked up through acquisitions of lands or easements according to objectives and management prescriptions in the Safford RMP Land Tenure Plan Amendment.**

Map 2-1

**Alternative 1 -  
Current Minerals Management**

Public land mineral estate acquired since 1988 will remain closed to mineral entry. Original public domain mineral estate will remain open to mineral entry.



**FINAL  
LAS CIENEGAS  
RESOURCE MANAGEMENT PLAN**



United States Department of the Interior  
BUREAU OF LAND MANAGEMENT  
TUCSON FIELD OFFICE



**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- ▨ Federal Minerals, Not Open to Entry
- ▤ Federal Minerals, Open to Entry

# FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN

## Map 2-2 North Half Alternative 1- Route Designations

This map shows the use designations pursuant to 43 CFR 8342 for routes on BLM administered lands to provide access and meet resource management objectives under this alternative.

Existing roads across State Trust lands and private lands are shown for reference only. These routes may not have legal public access and they may or may not be open to public use in the future.



Planning Area Boundary

### Route Designations:

- Open to All Motorized Travel Year-Round
- Open to Administrative Motor Vehicle Use Only  
Open to Non-Motorized Public Travel Year-Round
- Closed to All Travel. Obliterate and Revegetate.
- Routes Across Non-Federal land, including private and State Trust land, not subject to BLM use designations.
- New Road Construction

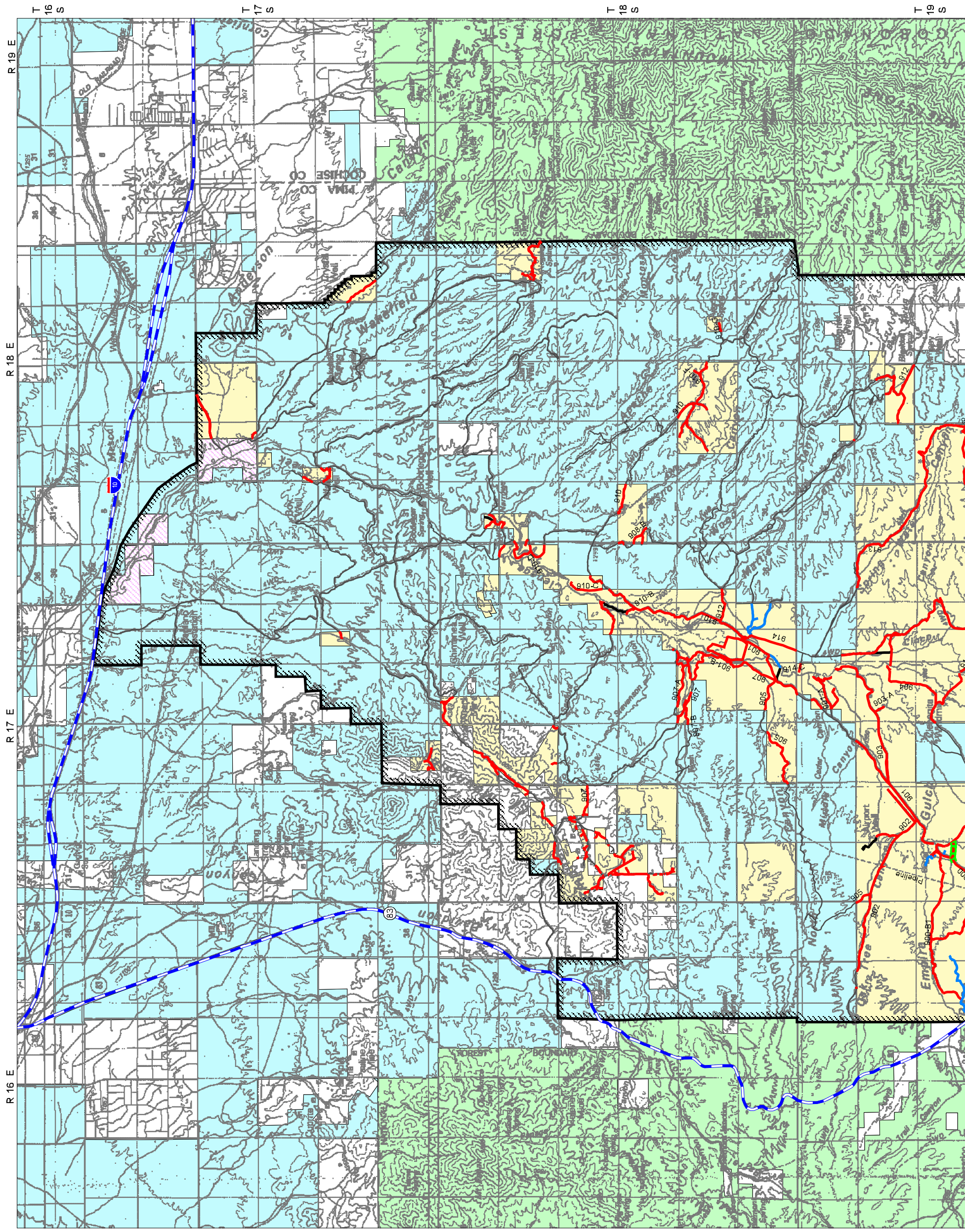
- Bureau of Land Management
- State Land Department
- National Forest
- County Land
- Military Land
- Private

1:100000



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


# FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN

## Map 2-2 South Half Alternative 1- Route Designations

This map shows the use designations pursuant to 43 CFR 8342 for routes on BLM administered lands to provide access and meet resource management objectives under this alternative.

Existing roads across State Trust lands and private lands are shown for reference only. These routes may not have legal public access and they may or may not be open to public use in the future.

-  Planning Area Boundary
- Route Designations:**
  -  Open to All Motorized Travel Year-Round
  -  Open to Administrative Motor Vehicle Use Only.  
Open to Non-Motorized Public Travel Year-Round
  -  Closed to All Travel. Obliterate and Revegetate.
  -  Routes Across Non-Federal land, including private and State Trust land, not subject to BLM use designations.
  -  New Road Construction

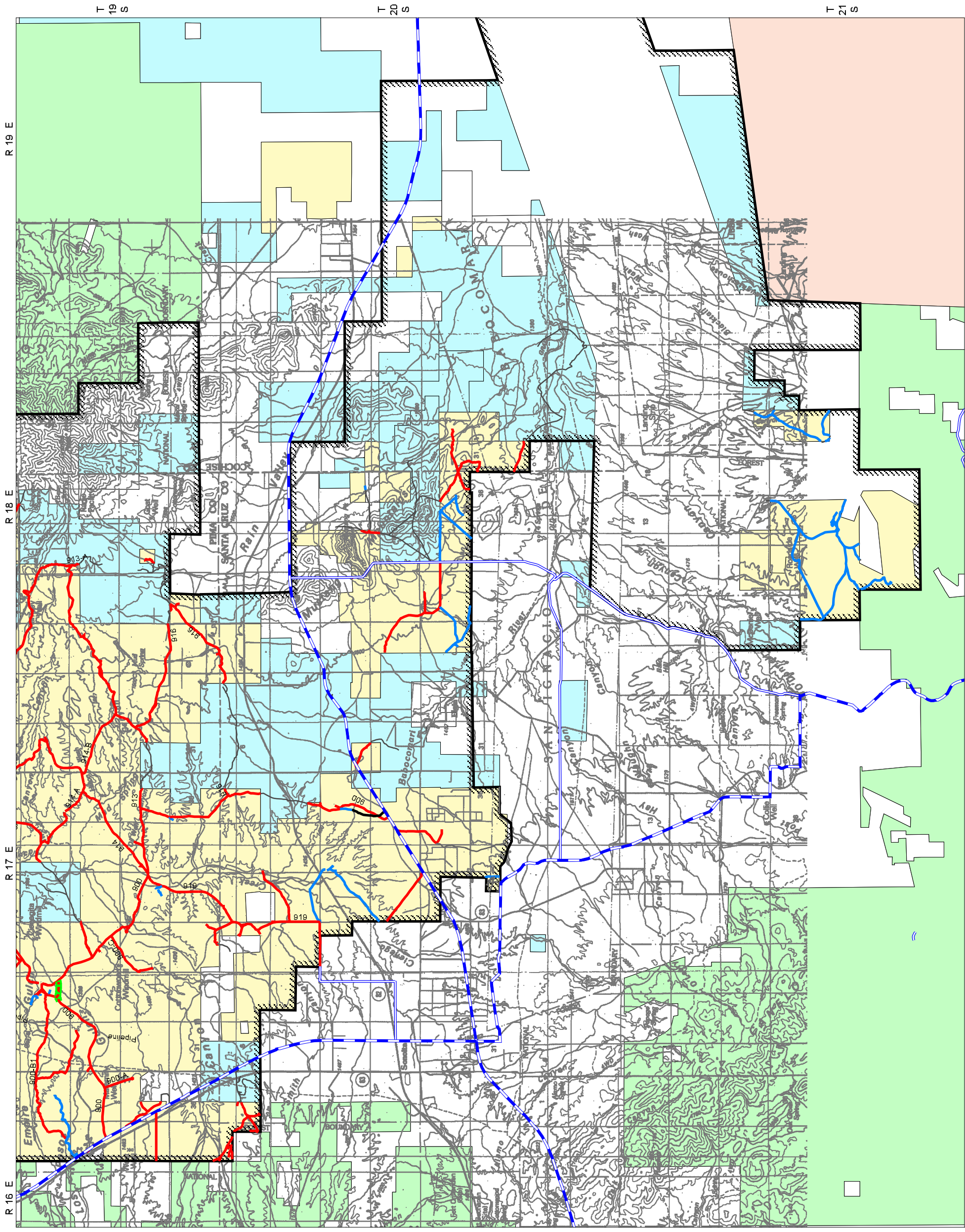
-  Bureau of Land Management
-  State Land Department
-  National Forest
-  County Land
-  Military Land
-  Private

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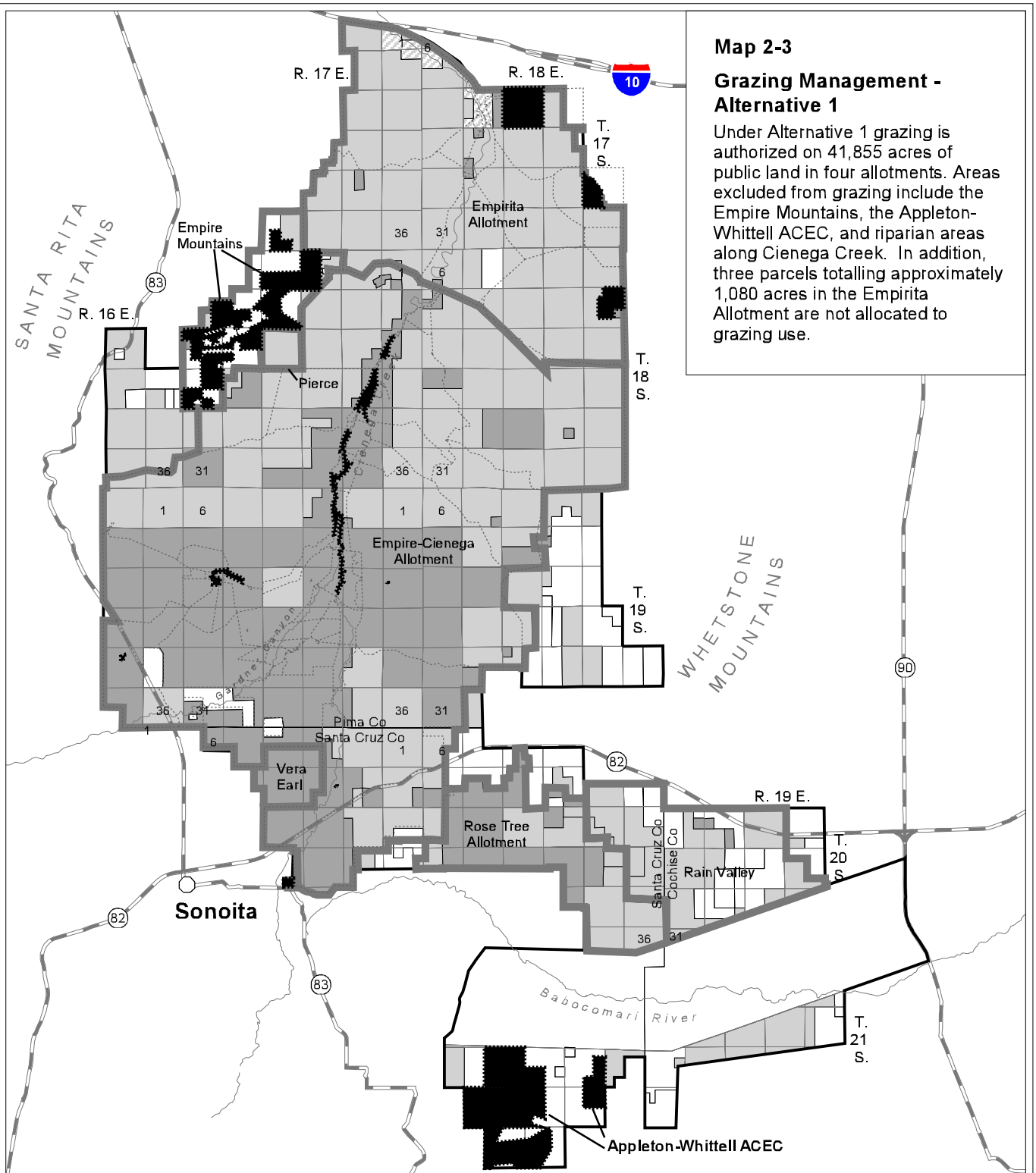
April 2002



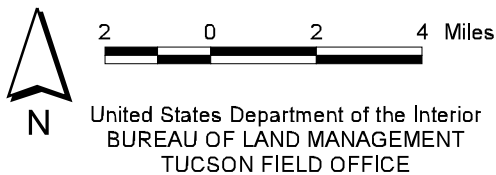
**Map 2-3**

**Grazing Management - Alternative 1**

Under Alternative 1 grazing is authorized on 41,855 acres of public land in four allotments. Areas excluded from grazing include the Empire Mountains, the Appleton-Whittell ACEC, and riparian areas along Cienega Creek. In addition, three parcels totalling approximately 1,080 acres in the Empirita Allotment are not allocated to grazing use.



**FINAL  
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RESOURCE MANAGEMENT PLAN**



**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Grazing Allotments
- Grazing Excluded
- Existing Fences



**Table 2-6  
Livestock Grazing under Alternative 1, Las Cienegas Resource Management Plan**

Allotment	AUMs Allocated to Grazing	Total Acres	Total Acres Grazed	BLM Acres Grazed	BLM Acres Not Grazed <sup>1</sup>	ASLD Acres Grazed	Private Acres Total
Empire-Cienega (6090)	8,448	74,146	73,487	36,025	659	37,462	0
Empirita (6210)	108	24,988	23,908	440	1,080 <sup>2</sup>	23,468	0
Rose Tree (6043)	1,104	8,869	8,869	3,950	0	3,719	1,200
Vera Earl (6129)	324	1,440	1,440	1,440	0	0	na
Empire Mountain	0	3,524	0	0	2,480	0	1,044
<b>TOTAL:</b>	<b>9,984</b>	<b>115,923</b>	<b>107,704</b>	<b>41,855</b>	<b>4,219</b>	<b>64,649</b>	<b>2,244</b>

<sup>1</sup> An additional 3,141 public land acres on the Appleton-Whittell ACEC are excluded from livestock grazing and not within an allotment. This amount would bring the total public land acres not grazed in the planning area to 7,360. **The amount of acres within enclosures (und grazed) is approximate. The exact number of excluded acres may vary depending on the number, size, and location of study enclosures which will be developed to help evaluate the effectiveness of grazing management.**

<sup>2</sup> These 1,080 acres of public land in the Empirita allotment are a more recent land acquisition and have not been allocated for forage so stocking rates on the allotment have not been adjusted for the increased acreage. Therefore, these acres were not included in the BLM acres grazed column. However, they are not fenced from livestock so at times they may be subjected to livestock grazing.

### The Action Alternatives (Alternatives 2, 3, and 4)

The three action alternatives differ from current management in several ways. Under all three, desired resource conditions would include maintaining or achieving goals and objectives for the planning area developed by the Sonoita Valley Planning Partnership. Management under all three alternatives would emphasize the following:

- Conservation of four rare vegetation communities and 18 associated priority species.

- Retention of the scenic values of the landscape.
- Preservation, adaptive restoration, or scientific investigation of significant cultural properties.

The action alternatives propose differing land use allocations for mining, utility corridors, recreation zones, corridors for the Arizona Trail, and grazing. Each would make special designations for areas of critical environmental concern (ACECs).

## **Alternative 2--Land Use Plan Proposals (Agency Preferred)**

Alternative 2 emphasizes ecosystem management and the use of partnerships and collaboration during implementation to achieve desired resource conditions. Biannually, a Biological Planning Team would collaboratively evaluate monitoring data and issues relating to livestock grazing, recreation, and wildlife management for the primary goal of maintaining or achieving desired resource conditions. BLM would designate all public lands within the planning area as an area of critical environmental concern (ACEC) to protect sensitive riparian and wetland habitats. Livestock grazing would continue on public land allotments, but grazing operations would incorporate variable stocking rates and flexible rotations. BLM would designate two utility corridors and a corridor for the Arizona Trail and would close or restrict the use of some roads to provide a mix of motorized and non-motorized recreation, while ensuring that desired resource conditions are met. Both mechanized and motorized vehicles would be restricted to designated routes. *(This alternative is preferred by participants in the Sonoita Valley Planning Partnership.)*

### ***Desired Resource Conditions***

Under Alternative 2 (Agency Preferred), BLM would do the following to meet desired resource conditions:

#### ***Watershed: Upland, Riparian and Aquatic Management***

Manage public lands to achieve and maintain the goals and desired resource objectives for upland vegetation, riparian vegetation, and aquatic habitats developed through the Sonoita Valley Planning Partnership and described at the beginning of this chapter.

*(Common to Alternatives 2, 3, and 4)*

#### ***Fish and Wildlife Management***

Manage public lands to achieve and maintain the goals and desired resource objectives for fish and wildlife developed through the Sonoita Valley Planning Partnership and described at the beginning of this chapter.

*(Common to Alternatives 2, 3, and 4)*

Use an ecosystem approach to manage the four rare habitats (i.e., grassland, riparian/wetland, mesquite bosque, and oak woodland) that support the following priority species:

#### ***Fish***

Gila topminnow (T&E)  
Gila chub (federal candidate)  
Longfin dace

#### ***Amphibians and Reptiles***

Lowland leopard frog  
Chiricahua leopard frog (federal candidate  
T&E)  
Mexican garter snake

#### ***Birds***

Southwestern willow flycatcher (T&E)  
Yellow billed cuckoo (key riparian species)  
Gray hawk (key raptor species)  
Baird's sparrow (key grassland sparrow)  
Botteri's sparrow (key sacaton species)

#### ***Mammals***

Jaguar (T&E)  
Lesser long-nosed bat (T&E)  
Pronghorn (desirable big game and watchable wildlife species)  
Mule deer (desirable big game species)  
White-tailed deer (desirable big game species)  
Javelina (desirable big game species)

#### ***Plants***

Huachuca water umbel (T&E)

*Chapter 2: Part A–Land Use Alternatives*

Visual Resource Management

Designate 49,000 acres of public land as visual resource management (VRM) Class II (See Appendix 2, Visual Resource Management Class Objectives).

***(Common to Alternatives 2, 3, and 4)***

Cultural Resource Management

Manage public lands to achieve and maintain the goals and desired resource objective for cultural resources developed through the Sonoita Valley Planning Partnership and described at the beginning of this chapter.

***(Common to Alternatives 2, 3, and 4)***

Manage the historically significant buildings of the Empire Ranch Headquarters for public use.

***(Common to All Alternatives)***

Manage selected cultural properties outside the ranch headquarters area for scientific, conservation and public use. As data are collected, some properties and sites could be allocated to experimental use or discharged from management.

Work with Native Americans to select harvesting areas for noncommercial collection of indigenous plants.

***(Common to All Alternatives)***

Recreation Management

Manage public lands to achieve and maintain the goals and desired resource objective for recreation opportunities developed through the Sonoita Valley Planning Partnership and described at the beginning of this chapter.

***(Common to Alternatives 2, 3, and 4)***

In accord with these desired recreation goals and objective, manage public lands to maintain the three recreation opportunity settings (Roaded Natural, Natural, and Back Country) on public lands as described in Table 2-7.

***(Common to Alternatives 2, 3, and 4)***

The descriptions for Zones 0 (Rural) and Zone 4 (Primitive) are provided for reference. These zones occur in lands adjacent to the planning area in Sonoita and in the Mount Wrightston Wilderness, respectively.

***Land Use Allocations***

Under Alternative 2, BLM would make the following land use allocations:

Fish and Wildlife Management

Manage suitable public land habitats for the recovery or reestablishment of native populations in collaboration with federal and state agencies, user groups, and other interested parties. Provide for the reintroduction of Gila topminnow into suitable habitats in accordance with the existing BLM-AGFD Memorandum of Understanding. In addition, provide for the reintroduction, ~~range extensions~~, or supplementation of the following endangered, threatened, candidate and priority species within suitable habitats in accordance with existing regulations, policies and agreements:

***(Common to Alternatives 2, 3, and 4)***

- Gila chub
- Desert pupfish
- Southwestern willow flycatcher
- Aplomado falcon
- Native **Chiricahua** leopard frog
- **Lowland leopard frog**
- Black-tailed prairie dog
- Beaver
- Pronghorn
- Gould's turkey

Wildland Fire Management

BLM will suppress ~~all~~ natural or human-caused wildland fires by first addressing safety concerns to firefighters and the public and then addressing resource concerns. Because of the planning area's small size, and the proximity of an increasing number of homes in the wildland-urban interface, BLM ~~has determined that it will~~

**Table 2-7  
Desired Recreation Opportunity Settings, Empire-Cienega Planning Area**

	<b>Zone 0 Rural</b>	<b>Zone 1 Roaded Natural</b>	<b>Zone 2 Natural</b>	<b>Zone 3 Back Country</b>	<b>Zone 4 Primitive</b>
<b>Desired Resource Setting</b>	Somewhat natural environment with human changes strongly evident, including residences, businesses, and other structures; paved highways; county roads; improved and unimproved dirt roads; and utility lines and sites.	Generally natural environment with human modifications moderately evident, including house and other structures at ranch headquarters, improved dirt roads, range developments, and utility lines.	Mostly natural environment with low to moderate evidence of human changes, including unimproved and improved dirt roads, range developments, and utility lines.	Predominately natural environment of moderate to large size. Human modifications occasionally to somewhat evident, including unimproved dirt roads, range developments, and utility lines.	Predominately natural environment with human modifications rarely to occasionally evident, including unimproved trails and range developments .
	Some visitor impacts to soil and vegetation persist from year- to-year, typically in areas of moderate to high use, such as campsites, scenic overlooks, and interpretive sites.	Some visitor impacts to soil and vegetation persist from year- to-year, typically in areas of higher use, such as interpretive sites. Resource changes are evident but harmonious with the natural environment.	Some visitor impacts to soil and vegetation persist from year- to-year, typically in areas of moderate use, such as designated camping areas, group sites, and pullouts.	Most visitor impacts to soil and vegetation recover yearly, typically in areas of light and dispersed use such as desirable camping areas and trails.	Most visitor impacts to soil and vegetation recover annually and are typically found with light use in dispersed recreation concentration areas, such as desirable camping areas and trails.
<b>Desired Social Setting</b>	Opportunities for solitude low to moderate. Degree of challenge and risk low to moderate.	Opportunities for solitude low to moderate, degree of challenge and risk low to moderate. Moderate level of interaction among visitors.	Opportunities for solitude moderate to high, degree of challenge and risk low to moderate. Low to moderate level of interaction among visitors.	Opportunities for solitude moderate to excellent, degree of challenge and risk moderate to high. Low level of interaction among visitors, but may encounter some evidence of other users.	Opportunities for solitude generally excellent, degree of challenge and risk moderate to high. Low level of interaction among visitors, but may find minor evidence of other users.

**Table 2-7, continued**  
**Desired Recreation Opportunity Settings, Empire-Cienega Planning Area**

	<b>Zone 0 Rural</b>	<b>Zone 1 Roaded Natural</b>	<b>Zone 2 Natural</b>	<b>Zone 3 Back Country</b>	<b>Zone 4 Primitive</b>
<b>Desired Managerial Conditions</b>	Focus on maintaining recreation settings that often give users security and convenience.	Focus on maintaining recreation settings that occasionally to often give users security and convenience.	Focus on maintaining recreation settings that rarely to occasionally give users security and convenience.	Focus on maintaining recreation settings that rarely to occasionally give users security and convenience.	Focus on maintaining recreation settings that rarely give users security and convenience. Only subtle if any onsite controls and restrictions.
<b>Signing</b>		Occasional, including regulatory, interpretive, and directional signs.	Rare to occasional, including regulatory, interpretive, and directional signs.	Rare, including regulatory, interpretive, directional signs, as needed.	
<b>Typical Road Standard</b>		Improved dirt or gravel with moderate maintenance.	Improved dirt or gravel with occasional maintenance.	Dirt, rarely maintained.	
<b>Degree of User Facilities Developed</b>		Low to Moderate	Low	Very Low to None	
<b>Visitor Information (Type, Level, and Location)</b>		Formal/Informal, Moderate, Onsite /Offsite	Informal, Low, Offsite	Informal, Low, Offsite	

not manage unplanned ignitions for the benefit of resources **only once public safety and property protection can be assured and in conformance with the RMP. Due to intermixed land ownership patterns, BLM will pursue development of and utilize a multi-agency fire management strategy in the planning area which will consider both ecological and administrative issues.** (Common to All Alternatives).

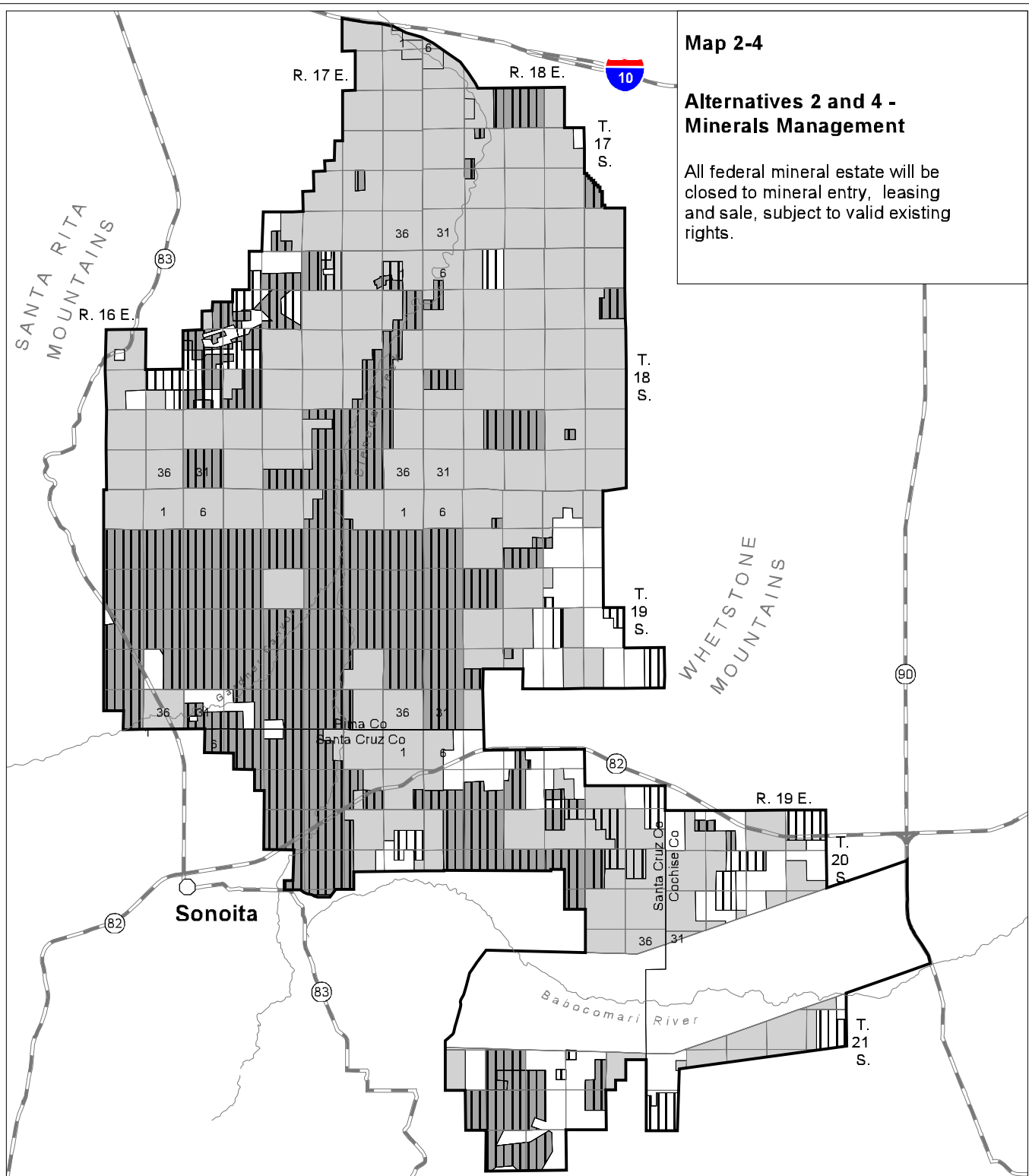
*Mineral Development*

Under Alternative 2, the planning area’s 48,542 acres of acquired public lands would remain closed to locatable and leasable mineral exploration and extraction (See Map 2-4). Public lands acquired in the future within the planning area would be closed to locatable and leasable mineral exploration and extraction. In addition, BLM would take the following actions:

Map 2-4

**Alternatives 2 and 4 - Minerals Management**

All federal mineral estate will be closed to mineral entry, leasing and sale, subject to valid existing rights.



**FINAL  
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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- ▨ Federal Minerals, Not Open to Entry

Chapter 2: Part A—Land Use Alternatives

- Petition to withdraw 458 acres of public domain lands in the Empire Mountains.
- Petition to withdraw ~~4,474.44~~ **5,726.86** acres of federal mineral estate with private surface and 1,440.18 acres of federal mineral estate with state surface from locatable and leasable mineral exploration and extraction.
- Not authorize mineral material sales on public lands in the planning area.

Utility Corridors

Designate two major utility corridors across public lands in the planning area (See Map 2-5):

- A 60-foot-wide corridor for buried utility lines running next to the existing El Paso Gas line right-of-way (with an option to tie into and within the existing El Paso easement through a cooperative agreement with El Paso Gas).
- A ~~1/8-mile~~ **500-foot**-wide corridor for overhead utility lines in the northeast part of the planning area. This corridor already has two overhead utility lines. No new lines can be placed west and south of Mattie Canyon. **Any proposed new lines would need to be placed within this corridor and east of the existing lines.**

All major utilities crossing public lands would be routed through the designated corridors and BLM would advise utilities to consider east-west routes along corridors proposed by the 1992 Western Regional Corridor Study-Arizona Map. Because of the configuration of the public land corridors and presence of intermixed State Trust Lands, the utility would also need to apply for and obtain a right-of-way from the Arizona State Land Department.

Land Use Permits

BLM would continue to consider other land use authorizations on a case-by-case basis with stipulations attached to any permits or leases to ensure consistency with the plan's goals and objectives.

Off-Highway Vehicle Management

Limit both motorized and mechanized vehicles to designated roads and trails on the 49,000 acres of public land according to the designated transportation system (See Map 2-6).  
(*Common to All Alternatives*)

**Under Alternative 2, BLM would make the following road and trail route designations on public lands to implement the Off-Highway Vehicle designation of Limited to Designated Roads (See Map 2-6):**

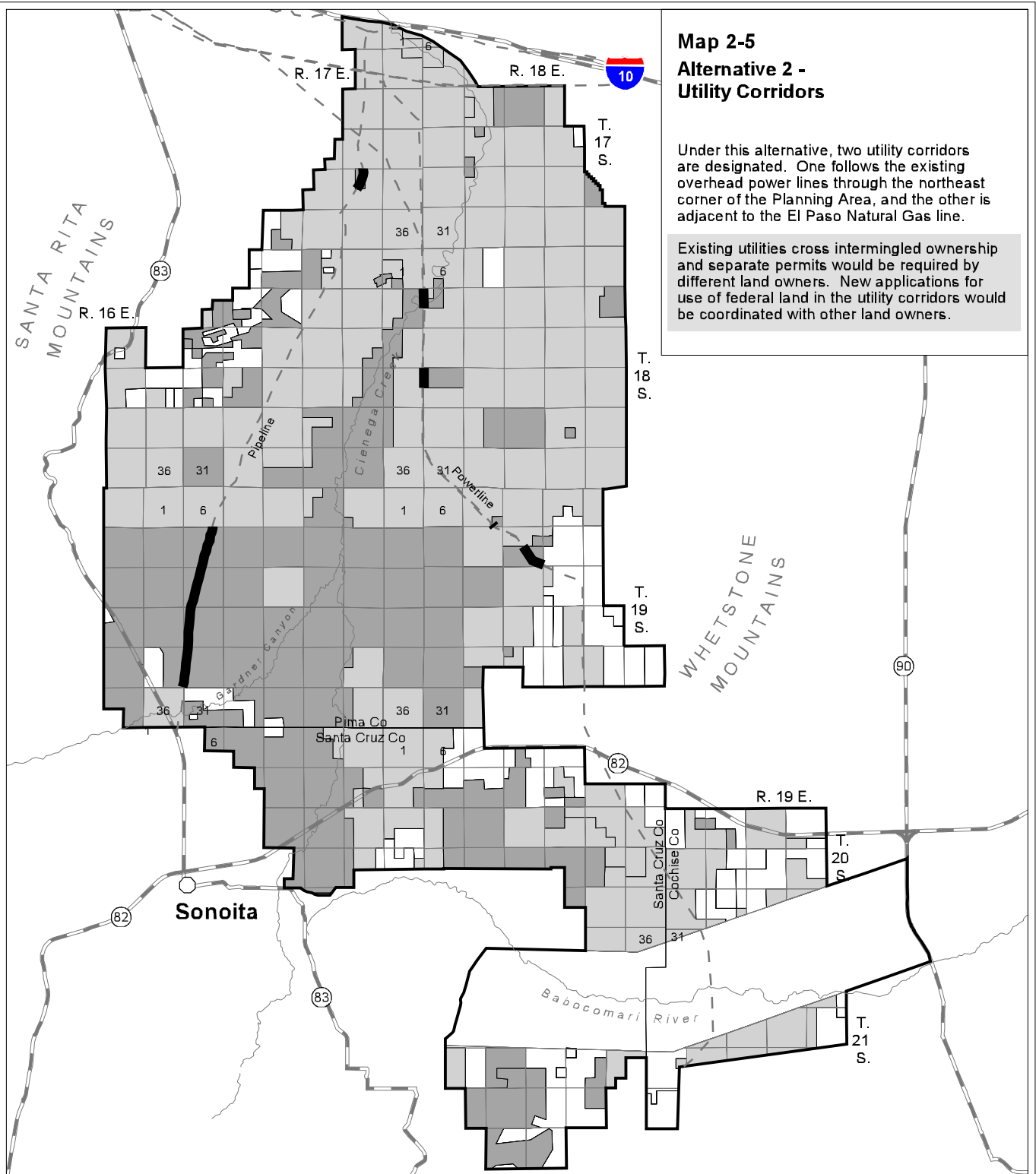
- ~~93.9~~ **91.9** miles would be open for motorized travel by the public.
- **0.4 miles of new road would be constructed as a bypass at the Empire Ranch Headquarters.**
- ~~1.0~~ **0.7** mile would be open for motorized travel by the public seasonally.
- ~~27.0~~ **28.7** miles would be designated for administrative use only.
- 6.6 miles would be converted to non-motorized trail for travel by mechanized vehicles, horseback, or foot.
- ~~16.0~~ **13.7** miles would be closed and rehabilitated.

**Roads designated as administrative use only may be opened temporarily for public use if needed to provide alternate access. This could occur if a route designated open for public use has to be closed temporarily for resource or public safety concerns.**

## Map 2-5 Alternative 2 - Utility Corridors

Under this alternative, two utility corridors are designated. One follows the existing overhead power lines through the northeast corner of the Planning Area, and the other is adjacent to the El Paso Natural Gas line.

Existing utilities cross intermingled ownership and separate permits would be required by different land owners. New applications for use of federal land in the utility corridors would be coordinated with other land owners.



# FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN



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### LEGEND

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Existing Utility Line
- Designated Utility Corridor












# FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN

## Map 2-6 North Half Alternative 2- Route Designations





This map shows the use designations pursuant to 43 CFR 8342 for routes on BLM administered lands to provide access and meet resource management objectives under this alternative.

Existing roads across State Trust lands and private lands are shown for reference only. These routes may not have legal public access and they may or may not be open to public use in the future.

-  Planning Area Boundary
- BLM Route Designations:**
  -  Open to All Motorized Travel Year-Round
  -  Open to All Motorized Travel: July 1 to March 31
  -  Open to Administrative Motor Vehicle Use Only.
  -  Open to Non-Motorized Public Travel Year-Round
  -  Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
  -  Closed to All Travel. Obliterate and Revegetate.
  -  Routes Across Non-Federal land, not subject to BLM use designations.
  -  New Road Construction

- Route Designations if Non-federal Land is Acquired:**
  -  Open to All Motorized Travel Year-Round
  -  Open to All Motorized Travel: July 1 to March 31
  -  Open to Administrative Motor Vehicle Use Only.
  -  Open to Non-Motorized Public Travel Year-Round
  -  Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
  -  Closed to All Travel. Obliterate and Revegetate.
  -  Routes Across Other Non-Federal land, not subject to BLM use designations.
  -  New Road Construction

Proposed route designations for non-Federal lands are for reference, showing how BLM would designate these when and if they are acquired. Designations for other undesignated routes in the Acquisition Planning District would be through a public process after acquisition.

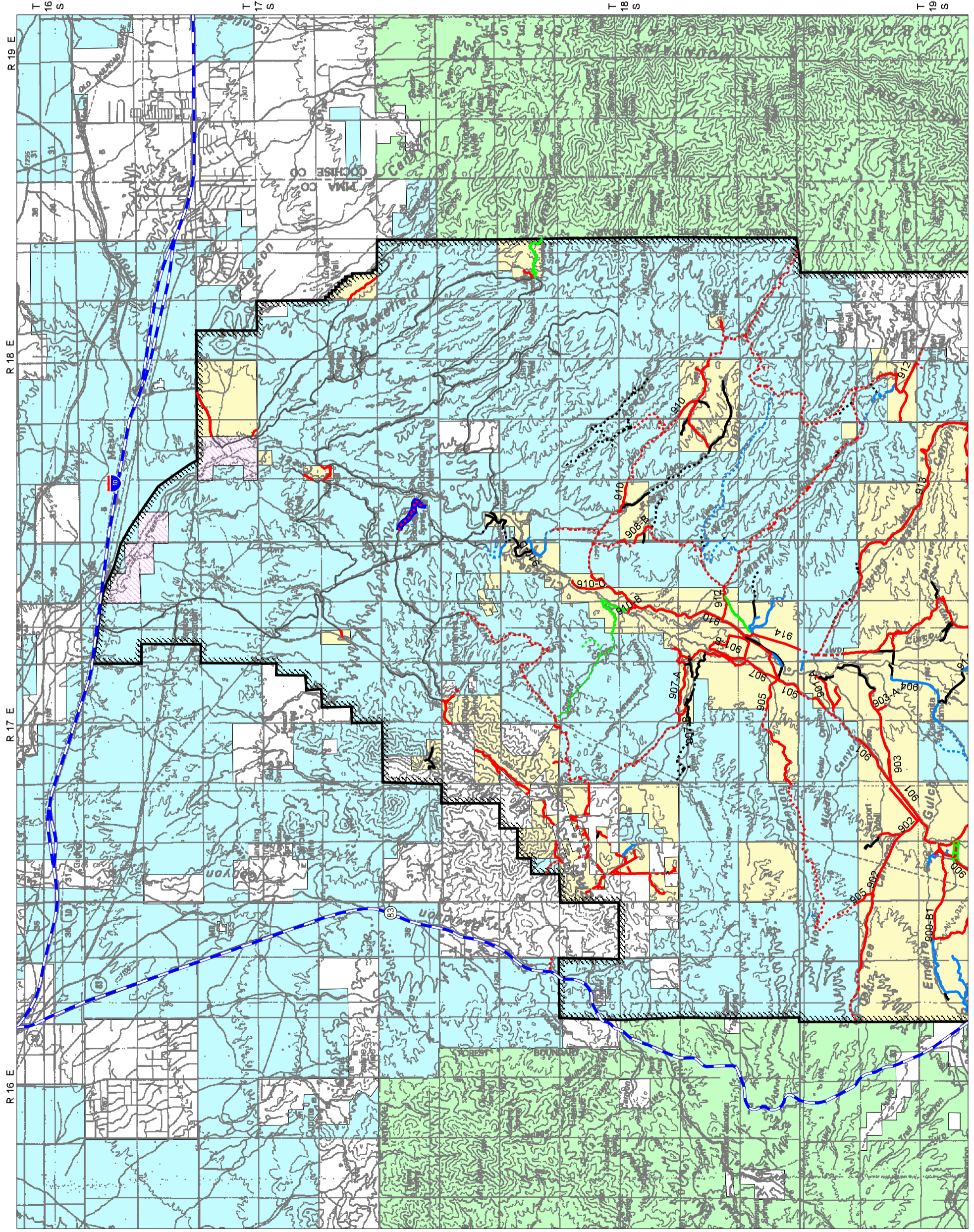
-  Bureau of Land Management
-  State Land Department
-  National Forest
-  County Land
-  Military Land
-  Private

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# FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN

## Map 2-6 South Half Alternative 2- Route Designations

This map shows the use designations pursuant to 43 CFR 8342 for routes on BLM administered lands to provide access and meet resource management objectives under this alternative.

Existing roads across State Trust lands and private lands are shown for reference only. These routes may not have legal public access and they may or may not be open to public use in the future.

- Planning Area Boundary**
- BLM Route Designations:**
- Open to All Motorized Travel Year-Round
  - Open to All Motorized Travel: July 1 to March 31
  - Open to Administrative Motor Vehicle Use Only
  - Open to Non-Motorized Public Travel Year-Round
  - Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
  - Closed to All Travel. Obliterate and Revegetate.
  - Routes Across Non-Federal land, not subject to BLM use designations.
  - New Road Construction

- Route Designations if Non-federal Land is Acquired**
- Open to All Motorized Travel Year-Round
  - Open to All Motorized Travel: July 1 to March 31
  - Open to Administrative Motor Vehicle Use Only
  - Open to Non-Motorized Public Travel Year-Round
  - Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
  - Closed to All Travel. Obliterate and Revegetate.
  - Routes Across Other Non-Federal land, not subject to BLM use designations.
  - New Road Construction

Proposed route designations for non-Federal lands are for reference, showing how BLM would designate these when and if they are acquired. Designations for other undesignated routes in the Acquisition Planning District would be through a public process after acquisition.

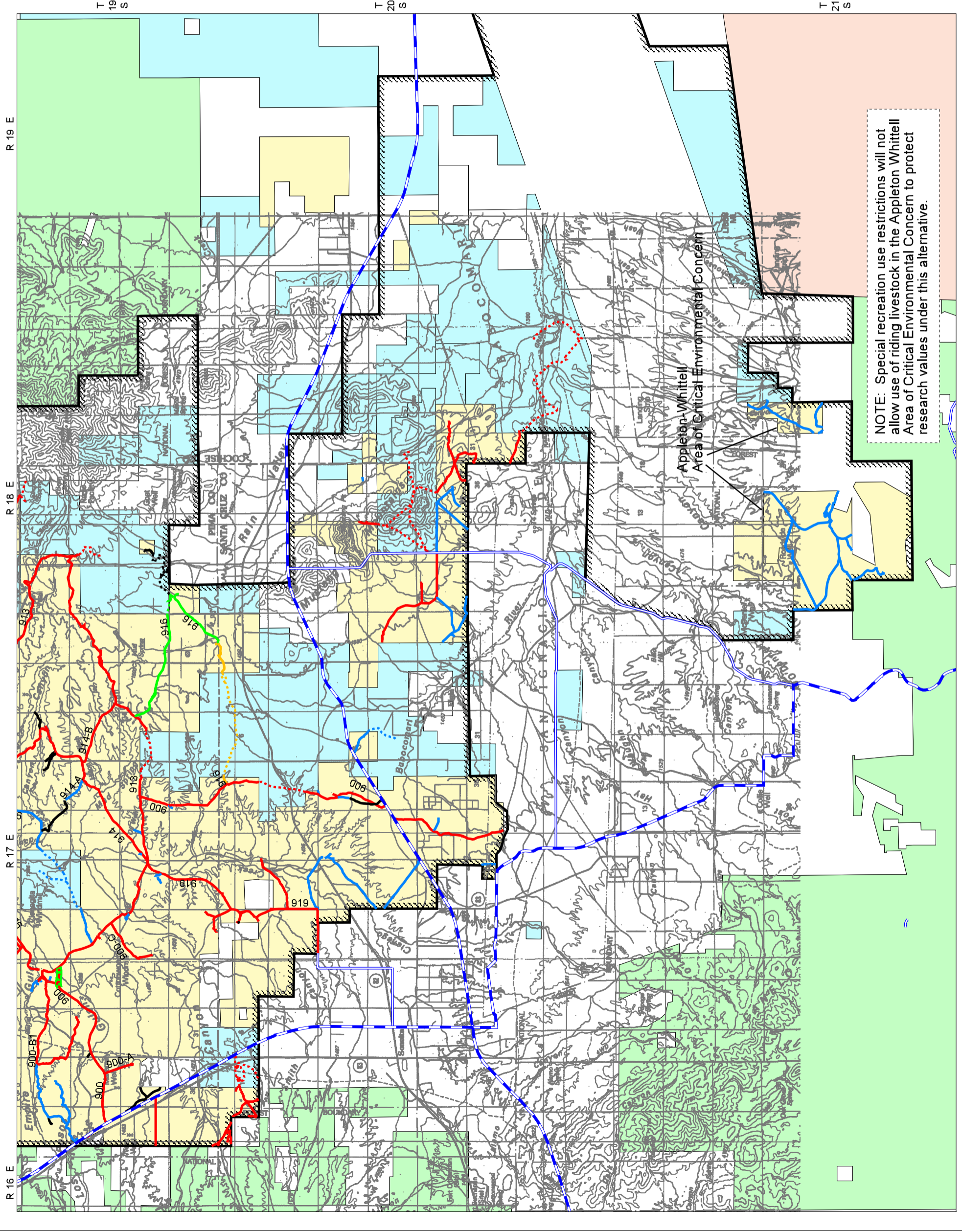
- Bureau of Land Management
- State Land Department
- National Forest
- County Land
- Military Land
- Private

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## Chapter 2: Part A—Land Use Alternatives

In addition to the above miles of roads and trails, the designated transportation system will also include the 11.6 miles of non-motorized Arizona Trail (see below), the *Heritage Discovery Trail* (a hardened interpretive trail at the Empire Ranch Headquarters, which is described under the Cultural Resource Management section of the Alternative 2 Activity Plan **Management Actions**), and the SAMBA North Canyon non-motorized trail described in the Alternative 2 Activity Plan **Management Actions**.

In addition, BLM will recommend to the Arizona State Land Department that similar designations be considered for the segments of these roads that cross intermixed State Trust Lands. **For lands acquired in the future, road designations on intermixed non-BLM lands (shown on Map 2-6 as dashed lines) would be implemented for consistent management. Route designations on other surrounding lands in the Acquisition Planning District, which may be acquired in the future by BLM, would be determined through a public process after acquisition.**

### Recreation Management

Establish three recreation zones on public lands within the planning area (Map 2-7) and manage them to conform to the three recreation opportunity settings described in Table 2-7 (Desired Resource Conditions) and in accord with the desired recreation goals and objective (*Common to Alternatives 2, 3, and 4*). The Activity Plan **Management Actions** for Alternative 2 describe in more detail recreation management within these zones. The size, location, and configuration of Zone 1 would be the same under Alternatives 2, 3, and 4.

- Zone 1 (Roaded Natural) offers developed, concentrated activities for a wide range of visitor types. It has easy access and visitor, interpretive, and educational facilities. It generally allows day use with no public

camping. Motorized traffic is directed to use designated parking, pullouts, and the loop drive. Recreation Zone 1 would consist of a half-mile-wide corridor along the entrance road (from Highway 83 to ranch headquarters). This zone would include the ranch headquarters and Empire Gulch Spring and would encompass 1,109 acres of public land. (*Common to Alternatives 2, 3, and 4*)

- Zone 2 (Natural) offers moderate access with infrequently maintained roads; concentrated visitor use in designated areas, including camping, parking, pullouts and group sites; and limited visitor facilities and interpretation. Under Alternative 2, Recreation Zone 2 would consist of 3,504 acres of public land, including half-mile-wide corridors along Oak Tree Canyon and South Roads.
- Zone 3 (Back Country/Semi-Primitive) offers a low concentration of visitors and a predominately natural environment, variable access that is likely to be difficult, low to no visitor facilities, limited signs, and dispersed low-impact recreational opportunities. Under Alternative 2, Recreation Zone 3 would consist of the remaining 44,387 acres of public lands in the planning area..

### Arizona Trail

Designate a corridor for the Arizona Trail across 11.6 miles of public lands (Map 2-8), determining the exact route after completing site assessments, including cultural resource surveys. The Arizona Trail within this corridor would require 9.3 miles of new trail building across public lands. About 1.7 miles of trail would be shared use on existing roads, and 0.6 miles would be converted from an abandoned road. To have a continuous trail, the corridor would also have to cross State Trust Lands after leaving BLM-administered lands near Wood Canyon. For the trail to cross State Trust Land,

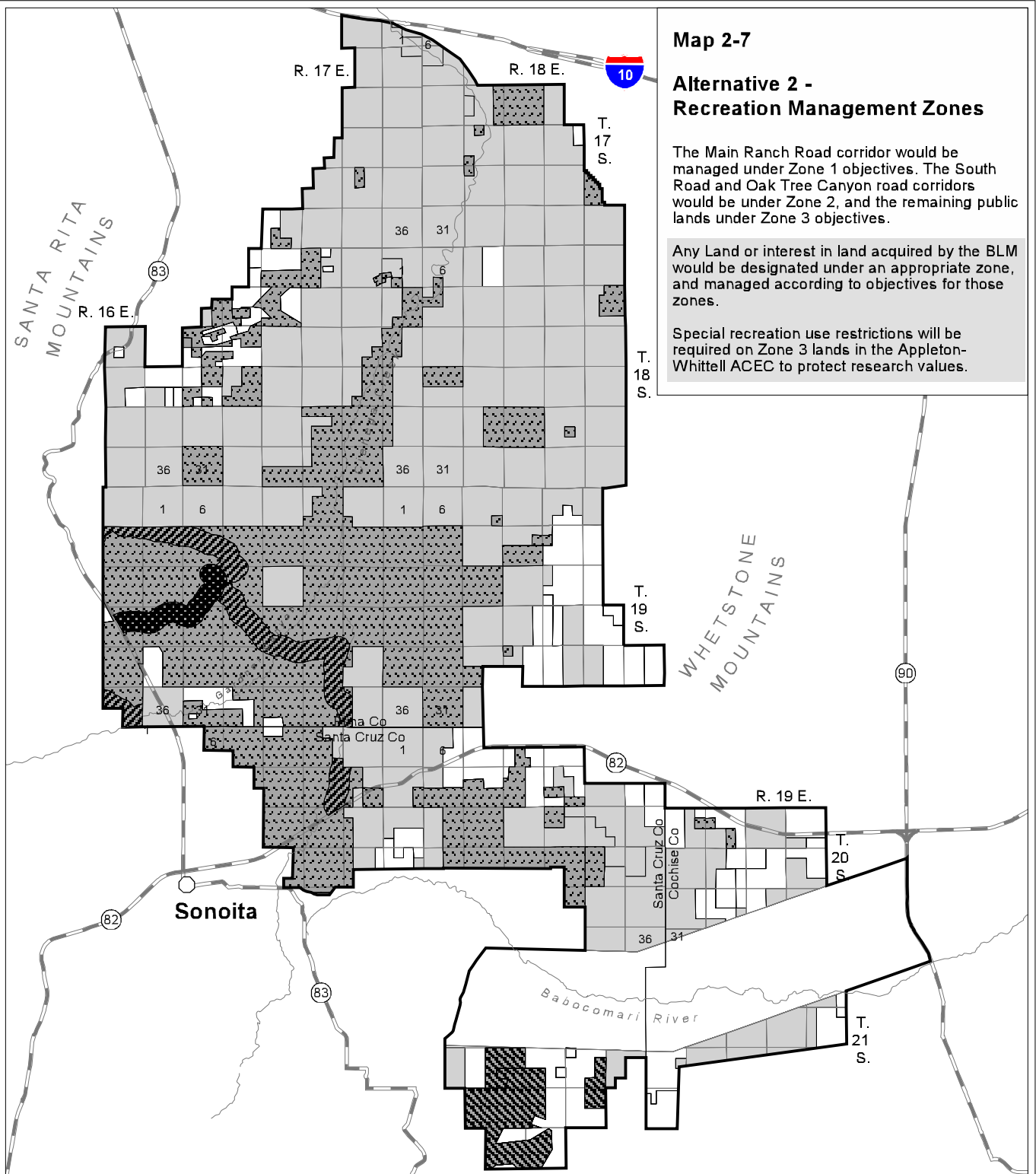
**Map 2-7**

**Alternative 2 -  
Recreation Management Zones**

The Main Ranch Road corridor would be managed under Zone 1 objectives. The South Road and Oak Tree Canyon road corridors would be under Zone 2, and the remaining public lands under Zone 3 objectives.

Any Land or interest in land acquired by the BLM would be designated under an appropriate zone, and managed according to objectives for those zones.

Special recreation use restrictions will be required on Zone 3 lands in the Appleton-Whittell ACEC to protect research values.



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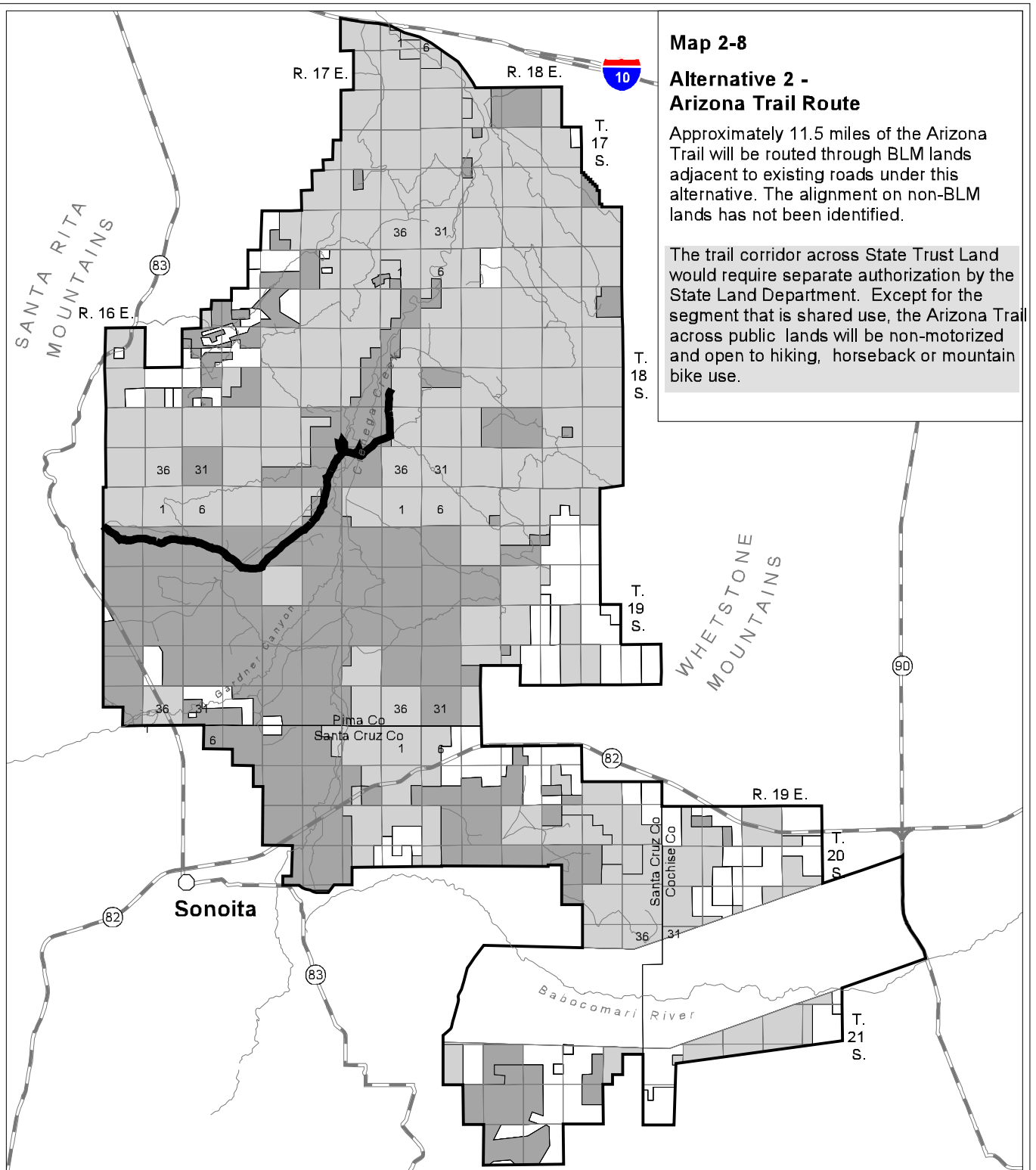


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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Zone 1
- Zone 2
- Zone 3
- Special Restriction Area



**Map 2-8**

**Alternative 2 - Arizona Trail Route**

Approximately 11.5 miles of the Arizona Trail will be routed through BLM lands adjacent to existing roads under this alternative. The alignment on non-BLM lands has not been identified.

The trail corridor across State Trust Land would require separate authorization by the State Land Department. Except for the segment that is shared use, the Arizona Trail across public lands will be non-motorized and open to hiking, horseback or mountain bike use.

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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Existing Road
- Arizona Trail Route

a right-of-way must be obtained from the Arizona State Land Department. Except for the segment that is shared use, the Arizona Trail will be non-motorized and available for hiking, horseback, or mountain bike use.

*Livestock Grazing Management*

Under Alternative 2, BLM would allocate 10,524 AUMs of forage for livestock grazing on approximately 42,155 acres of public land and continue to authorize livestock grazing on the Empire-Cienega, Empirita, Rose Tree, and Vera Earl allotments (Table 2-8).

BLM would also allocate acreage 360 AUMs of forage for livestock grazing on the approximately 2,480 acres of public lands in the Empire Mountains. (Map 2-9). The Empire Mountains allotment would not be activated until the prerequisites described in the activity plan Management Actions section of this alternative are completed. If the allotment is not activated within five years of the date of the Record of Decision on this plan, then the BLM would reassess the situation and consider reallocating the forage to watershed and other uses.

**Table 2-8  
Livestock Grazing under Alternative 2, Las Cienegas Resource Management Plan**

Allotment	AUMs Allocated to Grazing	Total Acres	Total Acres Grazed	BLM Acres <sup>1</sup> Grazed	BLM Acres <sup>2</sup> Not Grazed	ASLD Acres	Private Acres
Empire-Cienega (6090)	8,448	74,146	71,827	3,4365	2,319	37,462	0
Empirita (6210)	288	24,988	24,468	1,000	520	23,468	0
Rose Tree (6043)	1,104	8,869	8,469	3,550	400	3,719	1,200
Vera Earl (6129)	324	1,440	1,240	1,240	200	0	N/A
Empire Mountains	360	3,524	3,044	2,000	480	0	1,044
<b>TOTAL:</b>	<b>10,524</b>	<b>115,923</b>	<b>109,048</b>	<b>42,155</b>	<b>3,919</b>	<b>64,649</b>	<b>2,244</b>

<sup>1</sup> The number of acres available for grazing will vary with the number of acres in enclosures for both management and study purposes.

<sup>2</sup> The exact number of excluded acres may vary depending on the number, size, and location of study enclosures which will be developed to help evaluate the effectiveness of grazing management. An additional 3,141 public land acres in the Appleton-Whittell ACEC are excluded from livestock grazing and are not within an allotment, bringing to 7,060 the total public land acres excluded from livestock grazing.

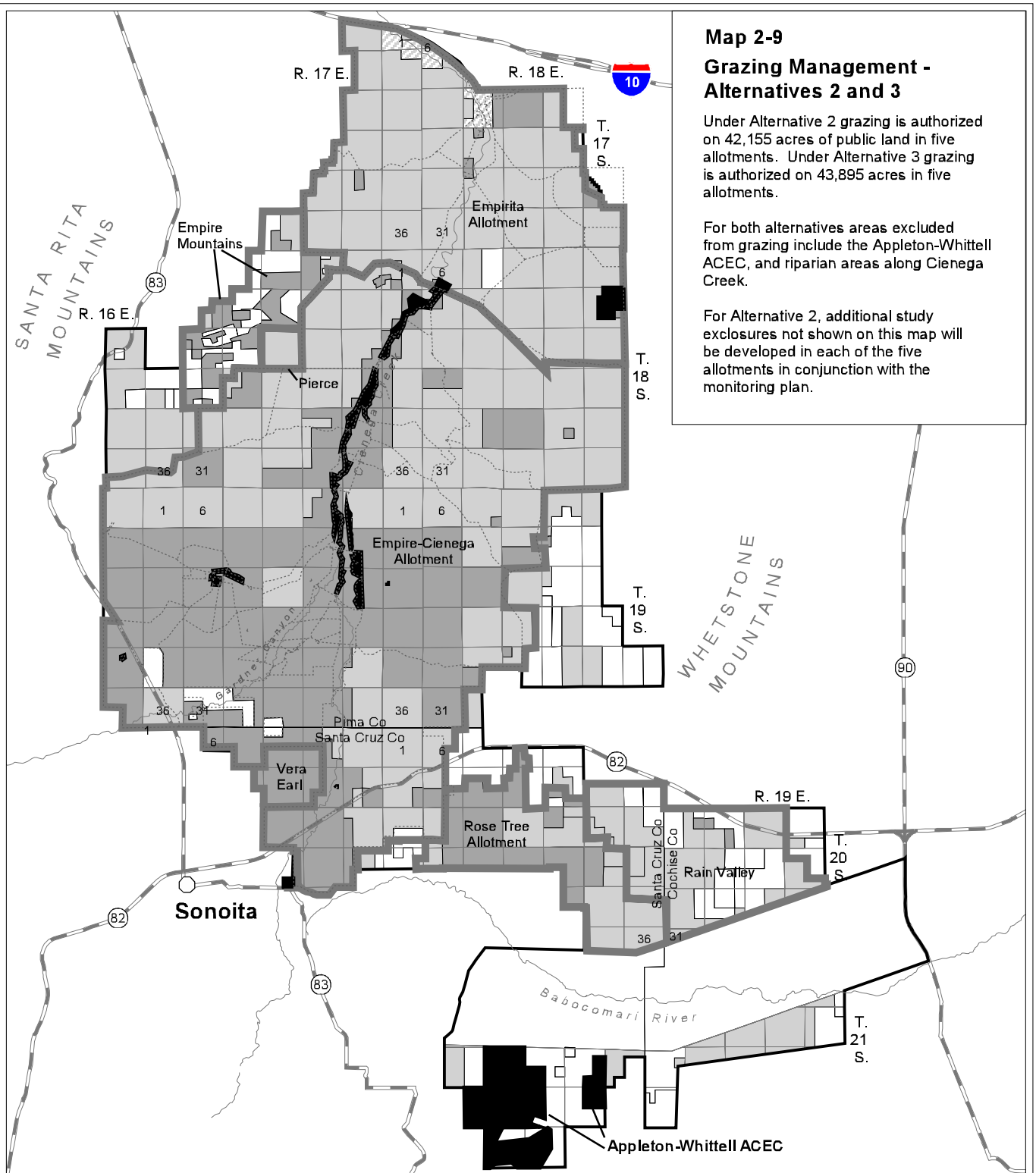
### Map 2-9

### Grazing Management - Alternatives 2 and 3

Under Alternative 2 grazing is authorized on 42,155 acres of public land in five allotments. Under Alternative 3 grazing is authorized on 43,895 acres in five allotments.

For both alternatives areas excluded from grazing include the Appleton-Whittell ACEC, and riparian areas along Cienega Creek.

For Alternative 2, additional study closures not shown on this map will be developed in each of the five allotments in conjunction with the monitoring plan.



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#### LEGEND

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Grazing Allotments
- Grazing Excluded
- Existing Fences

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But BLM would authorize grazing use in riparian pastures and exclosures **only at designated livestock crossing lanes and watering areas** or to meet resource objectives. For each of these allotments the **Activity Plan Management Actions** for Alternative 2 **has have** detailed narratives of livestock grazing management, including grazing strategies, **initial allocations livestock numbers**, and proposed range improvements.

### ***Special Designation Areas***

Under Alternative 2, BLM would make the following special designations:

#### ***Areas of Critical Environmental Concern***

Designate the Empire-Cienega Area of Critical Environmental Concern (ACEC) on 45,859 acres of public lands within the planning area Map 2-10). This ACEC would include all of the planning area's public lands except for the 3,141 acres of public lands now within the Appleton-Whittell ACEC (Research Ranch), which would remain as a separate ACEC and be renamed the Appleton-Whittell Research ACEC.

Any State Trust and private lands acquired in the future within the **planning area ACEC boundaries north of the Babocomari Land Grant** would be incorporated into the Empire-Cienega ACEC and managed according to the prescriptions of this plan. **Future acquisitions of State Trust and private lands within the planning area boundaries south of the Babocomari Land Grant** would be incorporated into the Appleton-Whittell Research ACEC and managed for **research values**.

The **Activity Plan Management Actions** for Alternative 2 would be the proposed management plan for the Empire-Cienega ACEC, including all management proposals common to Alternatives 2, 3, and 4 and all proposals specific to Alternative 2. See Appendix 2 for full descriptions of the ACECs, including management prescriptions. Appendix

2 also summarizes management prescriptions for the Appleton-Whittell Research ACEC from the Phoenix RMP (BLM 1988). **These are incorporated by reference into this RMP**). Table 2-9 summarizes the management prescriptions that would apply to the Empire-Cienega ACEC under Alternative 2 and compares these restrictions to those for ACEC management under Alternatives 3 and 4.

#### ***Wild and Scenic Rivers***

Continue to manage the Cienega Creek Wild and Scenic Rivers Study Area to protect resources pending congressional action on designation.

**(Common to All Alternatives)**

#### ***Land Tenure***

**Public lands in Las Cienegas NCA would be retained and additional public lands or easements would be acquired within the Sonoita Valley Acquisition Planning District according to the prescriptions in the Las Cienegas RMP/EIS Acquisition Strategy (See Appendix 2). The Acquisition Strategy includes criteria for prioritizing acquisitions and identifies both traditional and non-traditional means of acquisition from the NCA Act and other legislation.**

**Public lands which become contiguous with the NCA due to acquisitions of intermixed lands become part of the NCA. Acquisitions within the Sonoita Valley Acquisition Planning District become part of the NCA upon acquisition.**

**Any acquisitions of lands or easements inside the planning area (Empire-Cienega Long-Term Management Area) but outside the Sonoita Valley Acquisition Planning District would be completed according to objectives and management prescriptions in the Safford RMP Land Tenure Plan Amendment (summarized in the Management Guidance section of Appendix 2. (Common to Alternatives 2, 3, and 4)**

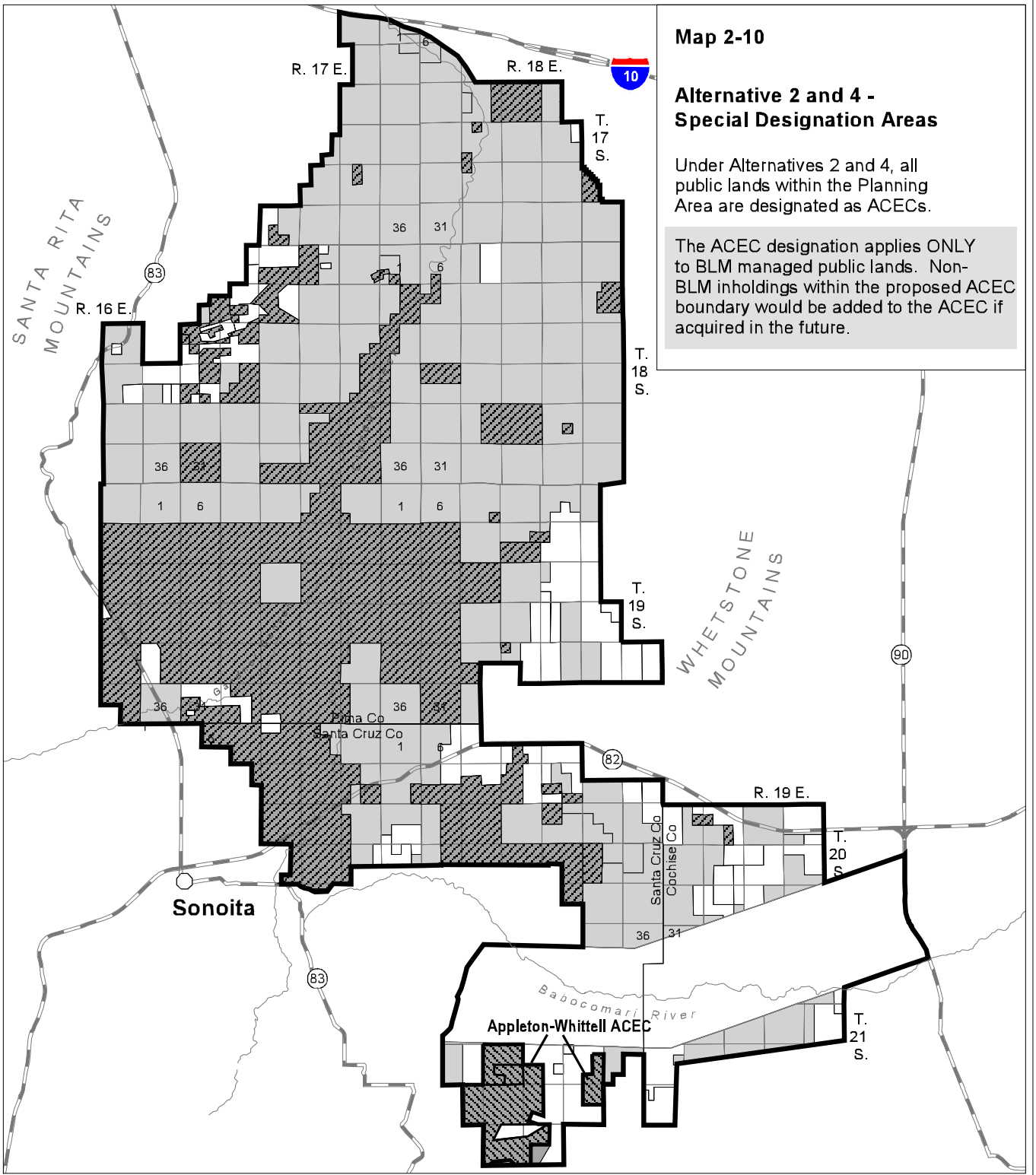


**Map 2-10**

**Alternative 2 and 4 -  
Special Designation Areas**

Under Alternatives 2 and 4, all public lands within the Planning Area are designated as ACECs.

The ACEC designation applies ONLY to BLM managed public lands. Non-BLM inholdings within the proposed ACEC boundary would be added to the ACEC if acquired in the future.



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- ▨ Proposed ACEC
- ▨ Existing ACEC

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**Table 2-9  
Summary of Management Within Areas of Critical Environmental Concern (ACECs)  
Under Alternatives 2, 3, and 4, Las Cienegas Resource Management Plan**

	Alternative 2	Alternative 3	Alternative 4
<b>Watershed and Riparian Area Management</b>			
Require permits for for collecting and harvesting plant materials in any amounts. <b>Establish limits on types and amounts of plant materials which can be collected or harvested.</b>	Yes	Yes <sup>1</sup>	Yes
Limit development on the 100-year floodplain of Cienega Creek to that needed to reduce impacts on riparian and aquatic areas.	Yes	Yes	Yes
Restrict activities <b>that are</b> found to degrade streambank stability and <b>that</b> decrease bank stability rating to below 90%.	Yes	Yes	Yes
<b>Rights-of-Way Management</b>			
Restrict major utility rights-of-way to designated corridors.	Yes	Yes <sup>1</sup>	Yes
<b>Minerals Management</b>			
Keep acquired public lands closed to locatable and leasable mineral extraction. Subject to valid existing rights, withdraw public domain lands to locatable and leasable mineral entry. Do not authorize mineral material sales.	Yes	locatable only. NSO for leasable in ACEC <sup>2</sup> Yes <sup>2</sup>	Yes
<del>Require free use permits for</del> Prohibit removal of mineral materials for personal use.	<del>Yes</del> No	Yes <sup>1</sup> No <sup>1</sup>	<del>Yes</del> No
Prohibit recreational gold panning, dredging, or sluicing within Cienega Creek or its tributaries on public lands.	Yes	Yes	Yes
<b>Livestock Grazing Management</b>			
Base livestock numbers on resource conditions and set them through the biological planning process.	Yes <sup>3</sup>	No	N/A
Limit livestock use in riparian areas of Cienega Creek and Nogales Springs to crossing lanes, watering areas, and areas where livestock grazing is needed as a management tool to meet a riparian or aquatic-related resource objective.	Yes	Yes	N/A
Adjust livestock grazing rotation and use levels and develop fencing, as needed, to meet cover requirements for pronghorn fawning and grassland sparrows.	Yes	Yes <sup>3,4</sup>	N/A

**Table 2-9, continued**  
**Summary of Management Within Areas of Critical Environmental Concern (ACECs)**  
**Under Alternatives 2, 3, and 4, Las Cienegas Resource Management Plan**

	Alternative 2	Alternative 3	Alternative 4
<b>Recreation Management</b>			
Limit motorized vehicles to designated roads on 49,000 acres of public land.	Yes	Yes <sup>1</sup>	Yes
Allow motorized and non-motorized permitted group activities to cross Cienega Creek only at dry crossings or designated road and trail crossings.	Yes	Yes	Yes
Prohibit camping in riparian areas within 100 feet of the water's edge on each side of the stream.	Yes	Yes	Yes
Do not authorize dog trials and require that dogs be leashed in important pronghorn fawning areas during the fawning season (April-June).	Yes	Yes <sup>4</sup>	Yes
Place travel restrictions (administrative or seasonal use) or closures on roads which are impacting sensitive resources.	Yes 44.0 miles	Yes <sup>1</sup> 42.7 miles	Yes 57.2 miles
Keep public lands in Recreation Zone 3 open to dispersed camping. Restrict camping on public lands in recreation Zone 2 to designated areas. Close public lands in Recreation Zone 1 to camping.	Yes	Yes <sup>3</sup>	Yes

<sup>1</sup> For Alternative 3, this restriction would apply to all public lands in the planning area, not just lands within ACECs.

<sup>2</sup> For Alternative 3, **Public lands in NCA would be closed to locatable mining and leasable minerals extraction, and public lands in ACECs would be closed to locatable mining. On public lands in ACECs that are not within the NCA, leasable minerals could be extracted, but drilling could not involve surface occupancy. NSO = no surface occupancy (NSO).**

<sup>3</sup> **For Alternative 2, flexible livestock stocking will occur but an upper limit will be established in the Land Use Plan.**

<sup>4</sup> For Alternative 3, this restriction would apply to all public lands in the planning area, but the ACEC would have no lands designated Recreation Zone 1 or 2, or pronghorn or grassland sparrow habitat.

### Alternative 3: Land Use Plan Proposals

Alternative 3 proposes allowing the greatest mix of land uses with restrictions to protect sensitive areas. It would designate two ACECs to protect sensitive riparian and wetland habitats. Outside the ACECs, public lands would be opened to mining, oil and gas leasing, and mineral sales. Livestock grazing would continue on public land allotments, but current livestock grazing operations would be modified by reducing livestock numbers to conservative fixed stocking rates and establishing structured

pasture rotations rather than variable stocking rates, seasonal use, and flexible rotations. BLM would designate three utility corridors and a corridor for the Arizona Trail. Alternative 3 proposes fewer road closures and restrictions than do Alternatives 2 and 4, with emphasis on a mix of motorized and non-motorized recreation opportunities. Alternative 3 would also limit camping to designated sites on the most acreage.

#### *Desired Resource Conditions*

Under Alternative 3, BLM would do the following to meet desired resource conditions:

Watershed: Upland, Riparian and Aquatic Management

Apply management to meet and maintain the goals and objectives (desired future conditions) for upland vegetation, riparian vegetation and aquatic habitats as described for Alternative 2. **(Common to Alternatives 2,3, and 4)**

Fish and Wildlife Management

Apply management to meet and maintain the goals and objectives (desired future conditions) for fish and wildlife and place management emphasis on the four rare habitats that support 18 priority species as described for Alternative 2. **(Common to Alternatives 2,3, and 4)**

Visual Resource Management

Designate 49,000 acres of public land as visual resource management (VRM) Class II (See Appendix 2, Visual Resource Management Class Objectives). **(Common to Alternatives 2,3, and 4)**

Cultural Resource Management

Under Alternative 3, management of cultural resources in the planning area would be the same as under Alternative 2.

Recreation Management

Manage to maintain three recreation opportunity settings on public lands as described for Alternative 2. **(Common to Alternatives 2, 3, and 4)**

**Land Use Allocations**

Under Alternative 3, BLM would make the following land use allocations:

Fish and Wildlife Management

Manage suitable public land habitats for the recovery or reestablishing of native populations in collaboration with federal and state agencies, user groups and other interested parties. Provide for reintroducing Gila topminnow into suitable habitats in accord with the existing BLM-AGFD Memorandum of Understanding. In addition,

provide for reintroducing the following endangered, threatened, candidate, and priority species in accord with existing regulations, policies, and agreements: **(Common to Alternatives 2, 3, and 4)**

- Gila chub
- Desert pupfish
- Southwestern willow flycatcher
- Aplomado falcon
- Native leopard frogs
- Black-tailed prairie dog
- Beaver
- Pronghorn
- Gould's turkey

Wildland Fire Management

BLM will suppress ~~all~~ natural or human-caused wildland fires by first addressing safety concerns to firefighters and the public and then addressing resource concerns. Because of the planning area's small size, and the proximity of an increasing number of homes in the wildland-urban interface, BLM ~~has determined that it will not~~ manage unplanned ignitions for the benefit of resources **only once public safety and property protection can be assured and in conformance with the RMP. Due to intermixed land ownership patterns, BLM will pursue development of and utilize a multi-agency fire management strategy in the planning area which will consider both ecological and administrative issues.**

(Common to All Alternatives).

Mineral Development

Outside of ACECs, open 41,000 acres of acquired lands to locatable mineral exploration and extraction and open future acquired public lands in the planning area to locatable mineral exploration and extraction under the General Mining Law subject to the 43 CFR 3809 and 43 CFR 3715 regulations (Map 2-11). In addition, BLM would open ~~45,859~~ **45,358** acres of public lands to mineral leasing (fluid minerals) subject to standard lease terms, conditions and stipulations. BLM would allow no surface

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occupancy in any ACECs, nor would BLM authorize mineral material sales. On the rest of the public lands, BLM would consider mineral materials sales on a case-by-case basis. The Appleton-Whittell ACEC will remain closed to mineral entry and leasing.

**Note: This proposal under Alternative 3 could not be implemented as it would violate the provisions of Las Cienegas NCA Act. The Act stipulates that all public lands within the NCA are to be closed to mineral entry and leasing and that public lands within the Sonoita Valley Acquisition Planning District are also to be managed in accordance with the Act.**

Utility Corridors

Designate three major utility corridors across public lands in the planning area (Map 2-12):

- A 60-foot-wide corridor for buried utility lines running next to the existing El Paso Gas line right-of-way (with an option to tie into and within the existing El Paso easement through a cooperative agreement with El Paso Gas).
- A 1/8-mile-500-foot-wide corridor for overhead utility lines. This corridor now has two overhead utility lines in the northeast part of the planning area. **No new lines can be placed west and south of Mattie Canyon. Any proposed new lines would need to be placed within this corridor and east of the existing lines.**
- A 50-foot-wide corridor for buried utility lines along State Highway 82 between Sonoita and the Cochise County line next to the Arizona Department of Transportation right-of-way.

All major utilities crossing public lands would be routed through the designated corridors and BLM would also advise utilities to consider east-west routes along corridors proposed by the 1992 Western Regional Corridor Study-Arizona

Map. Because of the configuration of the public land corridors and presence of intermixed State Trust Lands, the utility would also need to apply for and obtain a right-of-way from the Arizona State Land Department.

Land Use Permits

BLM would continue to consider other land use authorizations on a case-by-case basis with stipulations to any permits or leases to ensure consistency with the plan.

Off-Highway Vehicle Management

Limit motorized (but not mechanized) vehicles to designated roads and trails on the 49,000 acres of public land according to the designated transportation system (Map 2-13).

*(Common to All Alternatives)*

Under Alternative 3, BLM would make the following route designations on public lands **to implement the Off-Highway Vehicle designation of Limited to Designated Roads (Map 2-13):**

- 94.2 **89.0** miles open to public motorized travel.
- **0.4 miles of new road would be constructed as a bypass at the Empire Ranch Headquarters.**
- 5.9 **4.4** miles seasonally open to public motorized travel.

25.4 **30.5** miles designated for administrative use only.

- 7.6 **6.8** miles converted to non-motorized trail for travel by mechanized vehicles, horses, and foot.
- 11.4 **9.8** miles closed and rehabilitated.

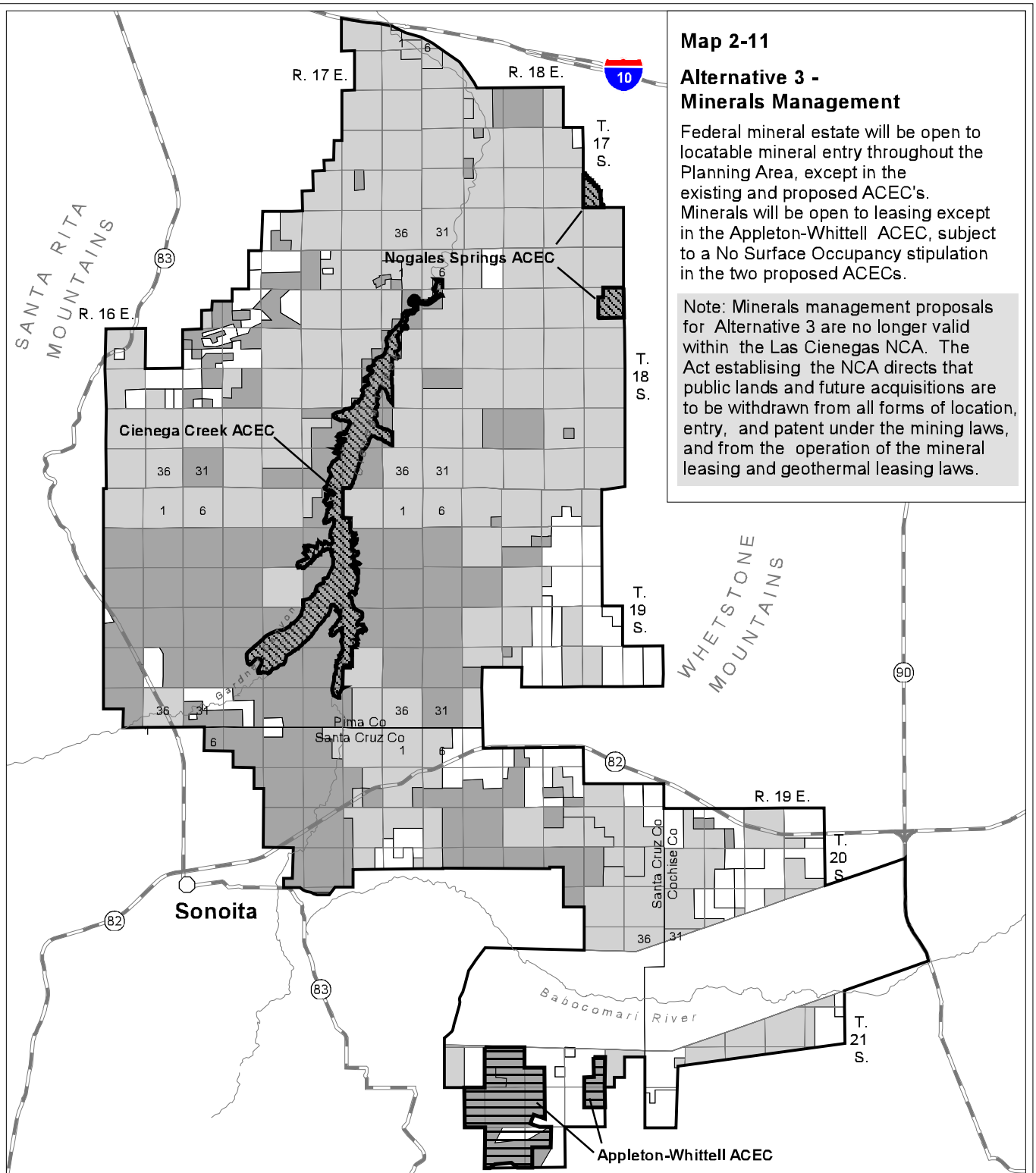
**Roads designated as administrative use only may be opened temporarily for public use if needed to provide alternate access. This could**

**Map 2-11**

**Alternative 3 -  
Minerals Management**

Federal mineral estate will be open to locatable mineral entry throughout the Planning Area, except in the existing and proposed ACEC's. Minerals will be open to leasing except in the Appleton-Whittell ACEC, subject to a No Surface Occupancy stipulation in the two proposed ACECs.

Note: Minerals management proposals for Alternative 3 are no longer valid within the Las Cienegas NCA. The Act establishing the NCA directs that public lands and future acquisitions are to be withdrawn from all forms of location, entry, and patent under the mining laws, and from the operation of the mineral leasing and geothermal leasing laws.



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**LEGEND**

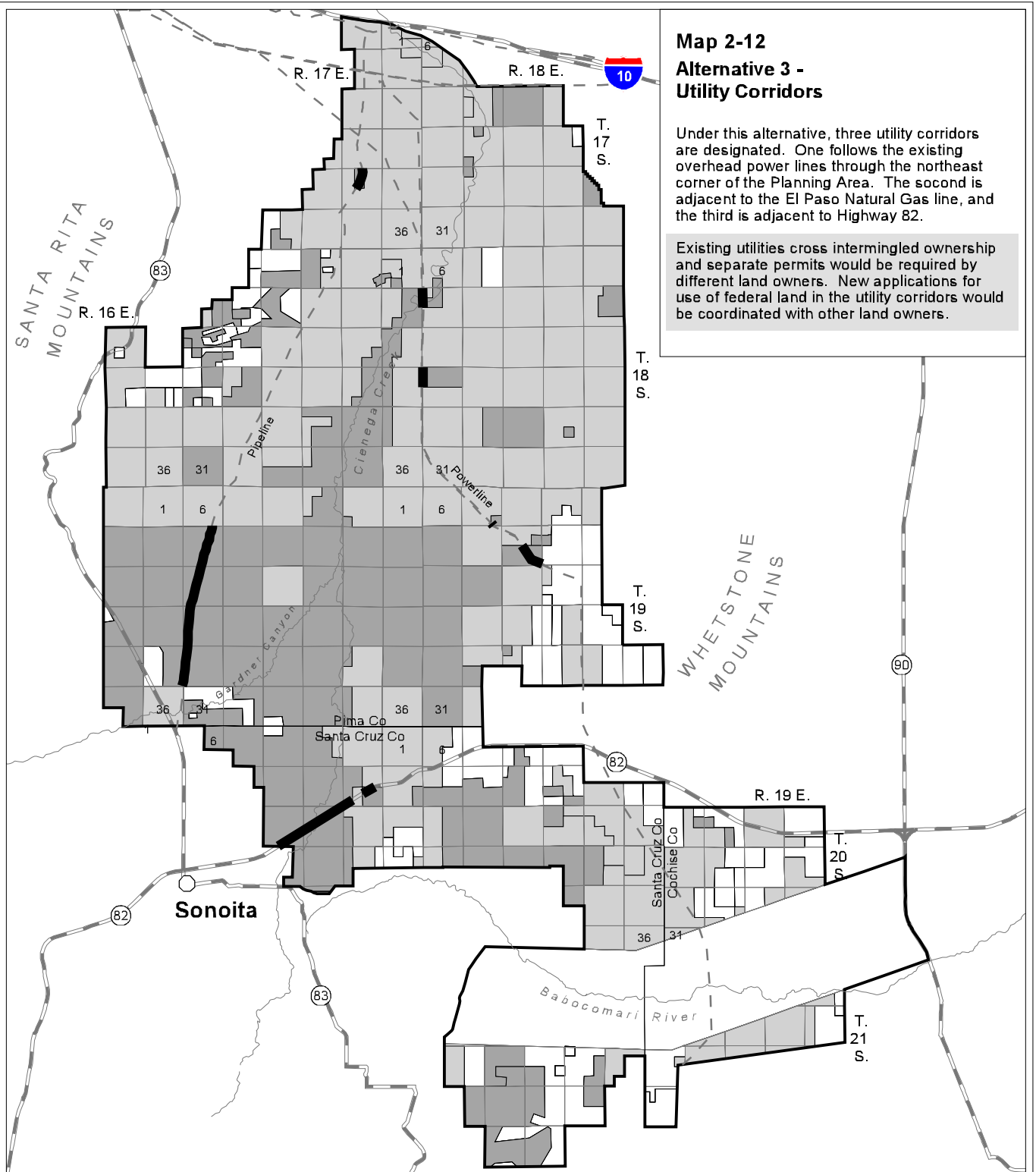
- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- ▨ Closed to Mineral Entry and Leasing
- ▩ Closed to Mineral Entry, Open to Leasing with NSO Stipulation

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**Map 2-12  
Alternative 3 -  
Utility Corridors**

Under this alternative, three utility corridors are designated. One follows the existing overhead power lines through the northeast corner of the Planning Area. The second is adjacent to the El Paso Natural Gas line, and the third is adjacent to Highway 82.

Existing utilities cross intermingled ownership and separate permits would be required by different land owners. New applications for use of federal land in the utility corridors would be coordinated with other land owners.



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**LEGEND**







- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Existing Utility Line
- Designated Utility Corridor

# FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN








## Map 2-13 North Half Alternative 3- Route Designations

This map shows the use designations pursuant to 43 CFR 8342 for routes on BLM administered lands to provide access and meet resource management objectives under this alternative.




Existing roads across State Trust lands and private lands are shown for reference only. These routes may not have legal public access and they may or may not be open to public use in the future.

-  Planning Area Boundary
- BLM Route Designations:**
  -  Open to All Motorized Travel Year-Round
  -  Open to All Motorized Travel: July 1 to March 31
  -  Open to Administrative Motor Vehicle Use Only.
  -  Open to Non-Motorized Public Travel Year-Round
  -  Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
  -  Closed to All Travel. Obliterate and Revegetate.
  -  Routes Across Non-Federal land, not subject to BLM use designations.
  -  New Road Construction

### Route Designations if Non-federal Land is Acquired:

-  Open to All Motorized Travel Year-Round
-  Open to All Motorized Travel: July 1 to March 31
-  Open to Administrative Motor Vehicle Use Only.
-  Open to Non-Motorized Public Travel Year-Round
-  Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
-  Closed to All Travel. Obliterate and Revegetate.
-  Routes Across Other Non-Federal land, not subject to BLM use designations.

Proposed route designations for non-Federal lands are for reference, showing how BLM would designate these when and if they are acquired. Designations for other undesignated routes in the Acquisition Planning District would be through a public process after acquisition.

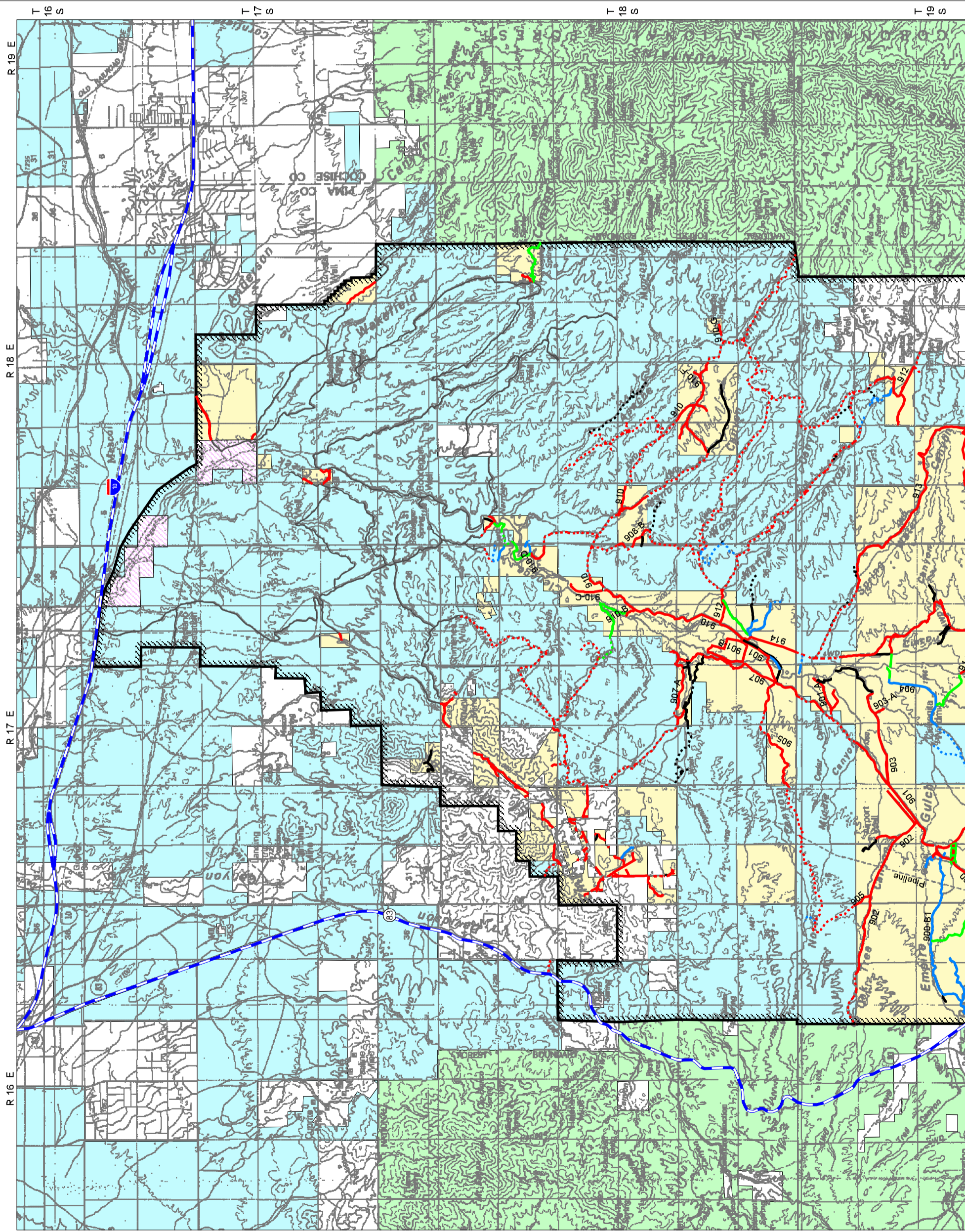
-  Bureau of Land Management
-  State Land Department
-  National Forest
-  County Land
-  Military Land
-  Private

1:100000



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















# FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN

## Map 2-13 South Half Alternative 3- Route Designations

This map shows the use designations pursuant to 43 CFR 8342 for routes on BLM administered lands to provide access and meet resource management objectives under this alternative.

Existing roads across State Trust lands and private lands are shown for reference only. These routes may not have legal public access and they may or may not be open to public use in the future.

-  Planning Area Boundary
- BLM Route Designations:**
  -  Open to All Motorized Travel Year-Round
  -  Open to All Motorized Travel: July 1 to March 31
  -  Open to Administrative Motor Vehicle Use Only.
  -  Open to Non-Motorized Public Travel Year-Round
  -  Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
  -  Closed to All Travel. Obliterate and Revegetate.
  -  Routes Across Non-Federal land, not subject to BLM use designations.
  -  New Road Construction
- Route Designations if Non-federal Land is Acquired:**
  -  Open to All Motorized Travel Year-Round
  -  Open to All Motorized Travel: July 1 to March 31
  -  Open to Administrative Motor Vehicle Use Only.
  -  Open to Non-Motorized Public Travel Year-Round
  -  Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
  -  Closed to All Travel. Obliterate and Revegetate.
  -  Routes Across Other Non-Federal land, not subject to BLM use designations.

Proposed route designations for non-Federal lands are for reference, showing how BLM would designate these when and if they are acquired. Designations for other undesignated routes in the Acquisition Planning District would be through a public process after acquisition.

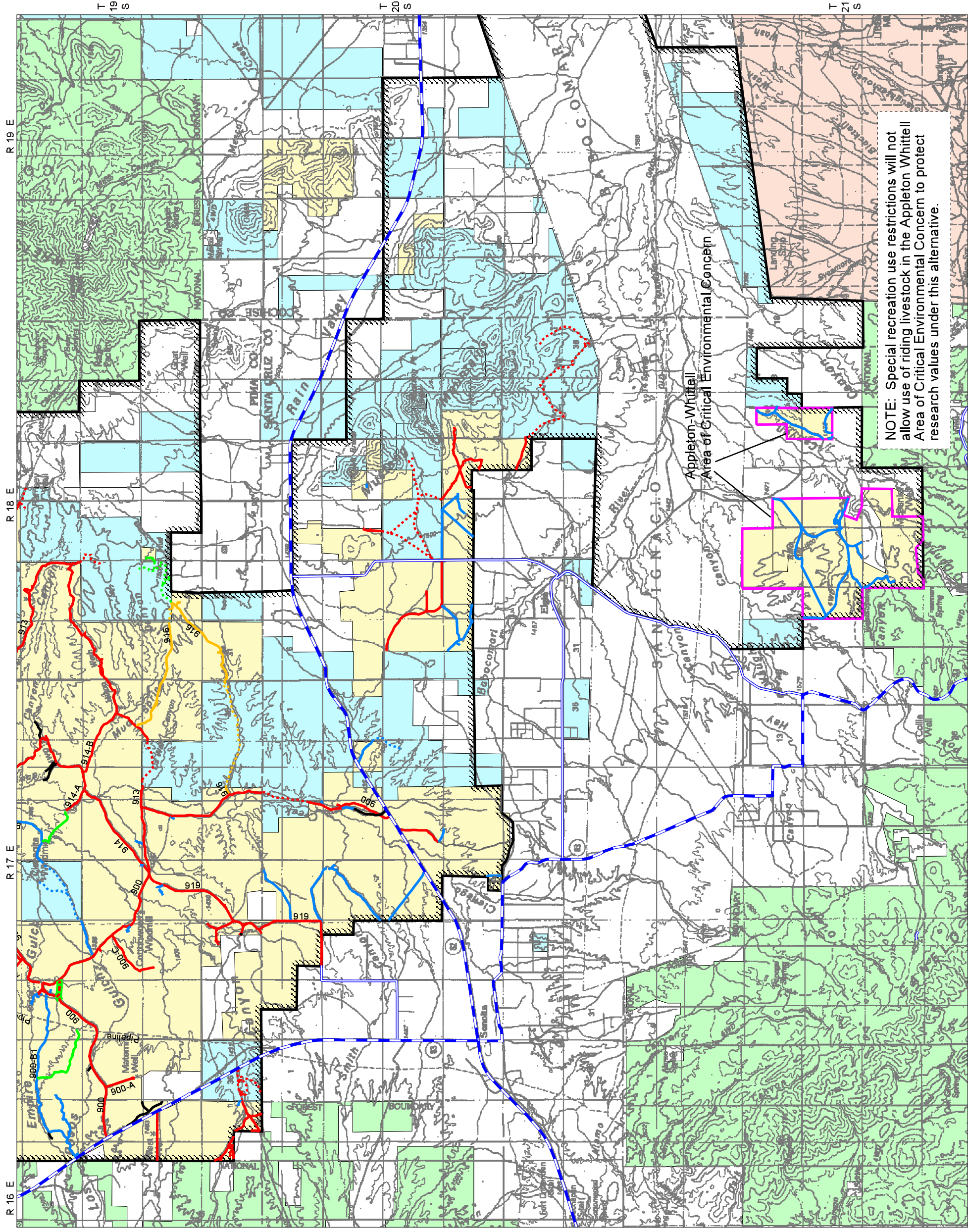
-  Bureau of Land Management
-  State Land Department
-  National Forest
-  County Land
-  Military Land
-  Private

1:100000



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NOTE: Special recreation use restrictions will not allow use of riding livestock in the Appleton Whittell Area of Critical Environmental Concern to protect research values under this alternative.

occur if a route designated open for public use has to be closed temporarily for resource or public safety concerns.

In addition to the above miles of roads and trails, the designated transportation system will also include the 14 miles of non-motorized Arizona Trail (see below), and the *Heritage Discovery Trail* (a hardened interpretive trail at the Empire Ranch Headquarters, which is described under the Cultural Resource Management section of the Alternative 2 Activity Plan **Management Actions**).

In addition, BLM will recommend to the Arizona State Land Department that similar designations be considered for the segments of these roads that cross intermixed State Trust Lands. For lands acquired in the future, road designations on intermixed non-BLM lands (shown on Map 2-13 as dashed lines) would be implemented for consistent management. Route designations on other surrounding lands in the Acquisition Planning District which may be acquired in the future by BLM, would be determined through a public process after acquisition.

BLM has not secured legal public access has not been secured to many of the 94.2 89.0 miles of public land roads, that this Alternative 3 would designate as open. In the future, other landowners may could close access to on some roads or portions of roads. In addition, BLM may might close roads or portions of roads seasonally, temporarily, or in emergencies close roads or portions of roads where hazard or resource conditions warrant. To address resource or management concerns, BLM may might also build new road segments to replace existing roads in response to resource or management concerns. As described under the Activity Plan **Management Actions** for Alternative 3 2, BLM would pursue legal public access on four road segments crossing Arizona State Trust Lands.

**(Common to Alternatives 2, 3, and 4)**

#### Recreation Management

Establish three recreation zones on public lands within the planning area (Map 2-14) and manage them to conform to the three recreation opportunity settings described in Table 2-7 (Desired Resource Conditions) and in accord with the desired recreation goals and objective (**Common to Alternatives 2, 3, and 4**). The Activity Plan **Management Actions** for Alternative 3 describes in more detail the management of recreation within these zones. The size, location, and configuration of Zone 1 would be the same under Alternatives 2, 3, and 4.

- Zone 1 (Roaded Natural) offers developed, concentrated activities for a wide range of visitor types. This zone has easy access with visitor, interpretive, and educational facilities. It generally allows day use with no public camping. Motorized traffic is directed to use designated parking, pullouts, and the loop drive. Recreation Zone 1 would consist of a half-mile wide corridor along the entrance road (from Highway 83 to ranch headquarters). This zone would include ranch headquarters and Empire Gulch Spring and would encompass 1,109 acres of public land. (**Common to Alternatives 2, 3, and 4**)
- Zone 2 (Natural) offers moderate access with infrequently maintained roads. Visitor use is concentrated in designated areas, including camping, parking, pullouts, and group sites. Visitor facilities and interpretation are limited. Under Alternative 3, Recreation Zone 2 would consist of 16,851 acres of public land, including land bounded by Oak Tree Canyon to the north and South Road to the east. This zone would also include a half-mile-wide corridor along the road from ranch headquarters to the Agricultural Fields and the public lands west of Highway 83.

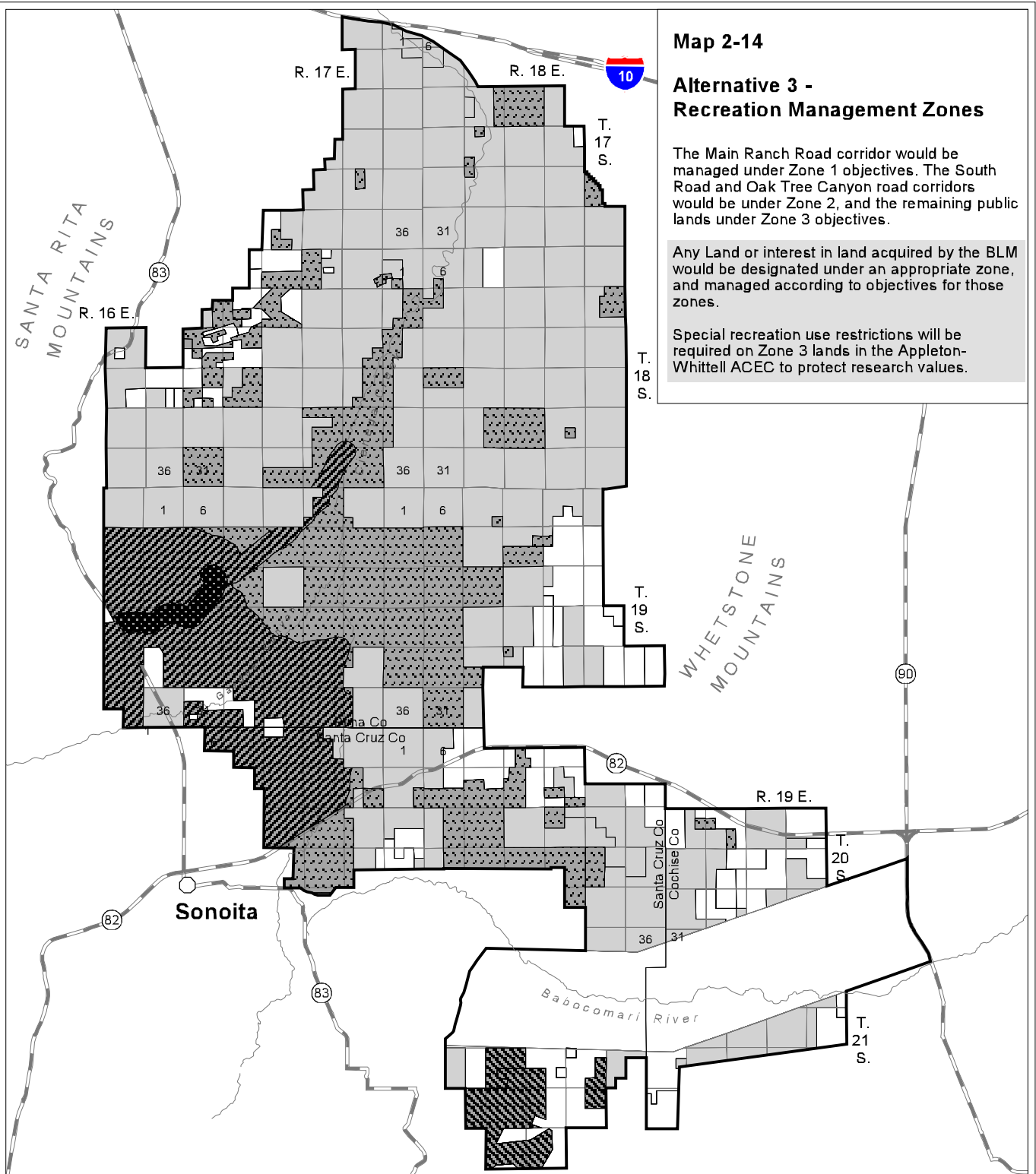
**Map 2-14**

**Alternative 3 -  
Recreation Management Zones**

The Main Ranch Road corridor would be managed under Zone 1 objectives. The South Road and Oak Tree Canyon road corridors would be under Zone 2, and the remaining public lands under Zone 3 objectives.

Any Land or interest in land acquired by the BLM would be designated under an appropriate zone, and managed according to objectives for those zones.

Special recreation use restrictions will be required on Zone 3 lands in the Appleton-Whittell ACEC to protect research values.



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Zone 1
- Zone 2
- Zone 3
- Special Restriction Area

- Zone 3 (Back Country/Semi-Primitive) offers low concentrations of visitors and a predominately natural environment. It has variable access that is likely to be difficult, low to no visitor facilities, limited signs, and dispersed low-impact recreational opportunities. Under Alternative 3, Recreation Zone 3 would consist of the remaining 31,040 acres of public lands in the planning area.

#### Arizona Trail

Designate a corridor for the Arizona Trail across 14 miles of public land (Map 2-15) and determine the trail's exact route within this corridor after completing site assessments, including cultural resource surveys. For the trail to pass within this corridor, 11.2 miles of new trail would need to be built across public lands. The remaining 2.8 miles would consist of shared use on existing roads. To have a continuous trail, the corridor would also have to be routed across 1 mile of intermingled State Trust Lands. For the trail to cross State Trust Land, a right-of-way must be obtained from the Arizona State Land Department. Except for the segment that is shared use, The Arizona Trail will be non-motorized and open to hiking, horseback, or mountain bike use.

#### Livestock Grazing Management

**Under Alternative 3, BLM would allocate 5,880 AUMs of forage on approximately 43,895 acres of public land for livestock grazing and continue to authorize livestock grazing on the Empire-Cienega, Empirita, Rose Tree, and Vera Earl allotments (Table 2-10). BLM would also be allocating allocate acreage**

**360 AUMs of forage** for livestock grazing on the **approximately 2,480 acres** of public lands in the Empire Mountains, where a new grazing allotment would be established (See Map 2-9).

**The Empire Mountains allotment would not be activated until the prerequisites described in the Management Actions section of Alternative 3 are completed. If the allotment is not activated within five years of the date of the Record of Decision on this plan, then the BLM would reassess the situation and consider reallocating the forage to watershed and other uses.**

BLM would authorize grazing use in riparian pastures and exclosures **only at designated livestock crossing lanes and watering areas** or to meet a resource objective. The **Activity Plan Management Actions** for Alternative 3 includes detailed narratives of livestock grazing management for each of these allotments, including grazing strategies, **initial allocations livestock numbers**, and proposed range improvements. **Special Designation Areas** Under Alternative 3, BLM would make the following special designations:

#### Areas of Critical Environmental Concern

Designate two ACECs on 4,859 acres of public land within the planning area:

- Designate 4,418 acres of public lands as the Cienega Creek ACEC (Map 2-16), which would include the entire perennial portion of Cienega Creek; perennial reaches of Gardner Canyon, Empire Gulch, and Mattie Canyon; and mesquite bosque and sacaton grasslands along the riparian areas.

**Table 2-10**  
**Livestock Grazing under Alternative 3, Las Cienegas Resource Management Plan**

<b>Allotment</b>	<b>AUMs of Forage Allocated for Grazing</b>	<b>Total Acres</b>	<b>Total Acres Grazed</b>	<b>BLM Acres Grazed</b>	<b>BLM Acres Not Grazed<sup>1</sup></b>	<b>ASLD Acres</b>	<b>Private Acres</b>
Empire-Cienega (6090)	4,680	74,146	73,487	36,025	659	37,462	0
Empirita (6210)	168	24,988	24,948	1,480	40	23,468	0
Rose Tree (6043)	516	8,869	8,869	3,950	0	3,719	1,200
Vera Earl (6129)	192	1,440	1,440	1,440	0	0	N/A
Empire Mountains	324	3,524	3,524	2,480	0	0	1,044
<b>TOTAL:</b>	<b>5,880</b>	<b>115,923</b>	<b>107,704</b>	<del>43,895</del> 45,375	699	64,649	2,244

<sup>1</sup> An additional 3,141 public land acres on the Appleton-Whittell ACEC would be excluded from livestock grazing and are not within an allotment, bringing the total public land acres excluded to 3,840.

- Designate 441 acres of public land as Nogales Springs ACEC, including Little Nogales and Nogales Springs.

Any State Trust and private lands acquired in the future within the Cienega Creek or Nogales Springs ACEC boundaries would be incorporated into the ACEC(s) and managed according to the prescriptions of this plan. Any State Trust and private lands acquired in the future within the Sonoita Valley APD boundary south of the Babocomari Land Grant would be incorporated into the Appleton-Whittell Research ACEC. and managed for research values according to the prescriptions of this plan.

The proposed management prescriptions for Cienega Creek and Nogales Springs ACECs

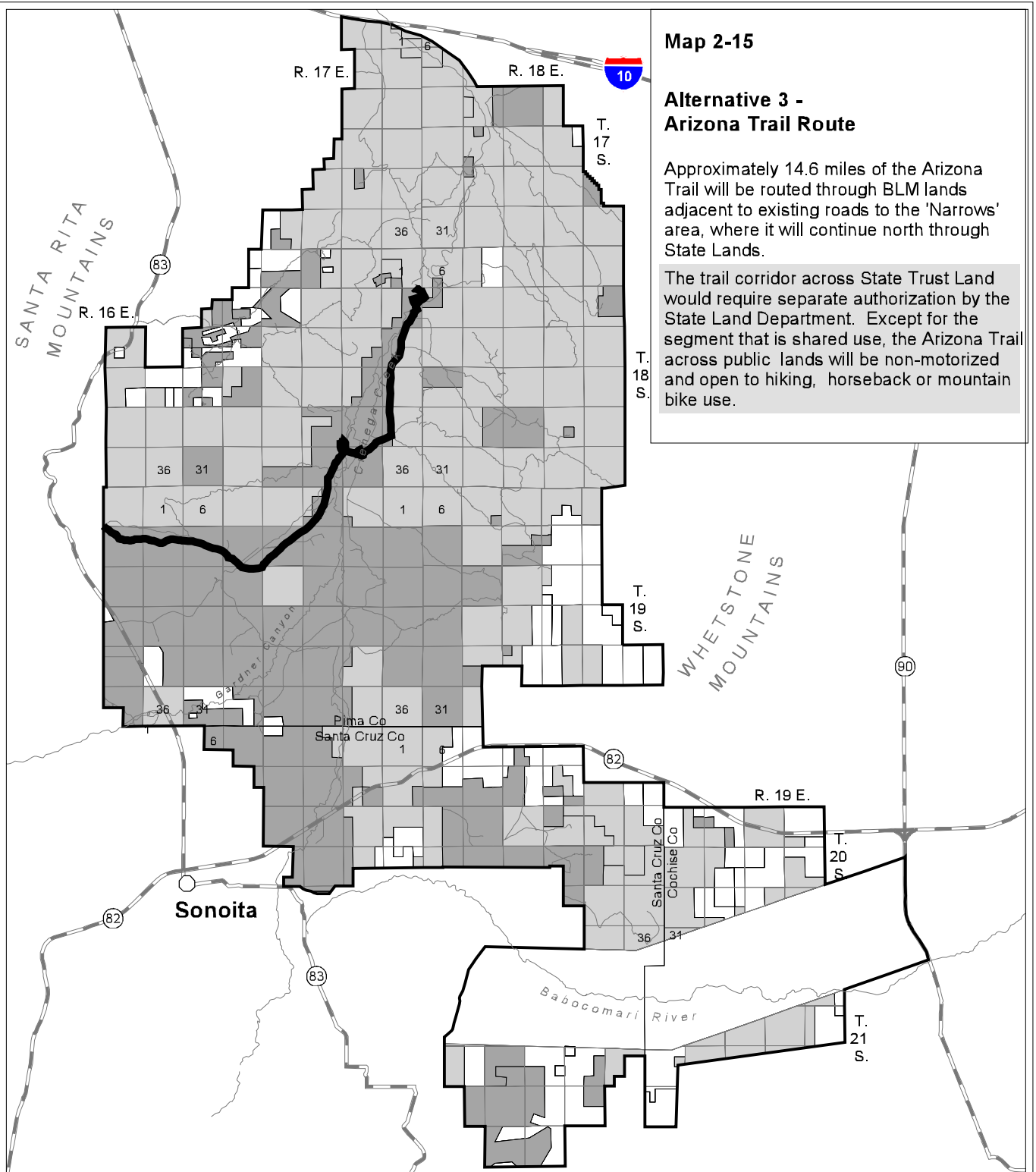
apply to the riparian areas and floodplains of Cienega Creek and Nogales and Little Nogales Springs and are included in the **Activity Plan Management Actions** for Alternative 3. These actions include proposals common to Alternatives 2, 3, and 4 and the proposals specific to Alternative 3. Table 2-9 summarizes the use restrictions within Cienega Creek and Nogales Springs ACECs under Alternative 3 and compares the restrictions of Alternative 3's ACEC proposals to those under Alternatives 2 and 4. Appendix 2 includes full descriptions of the ACECs and their management prescriptions. The Phoenix RMP (BLM 1988) prescribed management for the existing Appleton-Whittell Research ACEC. Appendix 2 also includes these prescriptions **which are incorporated into this plan by reference.**

**Map 2-15**

**Alternative 3 -  
Arizona Trail Route**

Approximately 14.6 miles of the Arizona Trail will be routed through BLM lands adjacent to existing roads to the 'Narrows' area, where it will continue north through State Lands.

The trail corridor across State Trust Land would require separate authorization by the State Land Department. Except for the segment that is shared use, the Arizona Trail across public lands will be non-motorized and open to hiking, horseback or mountain bike use.



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**LEGEND**

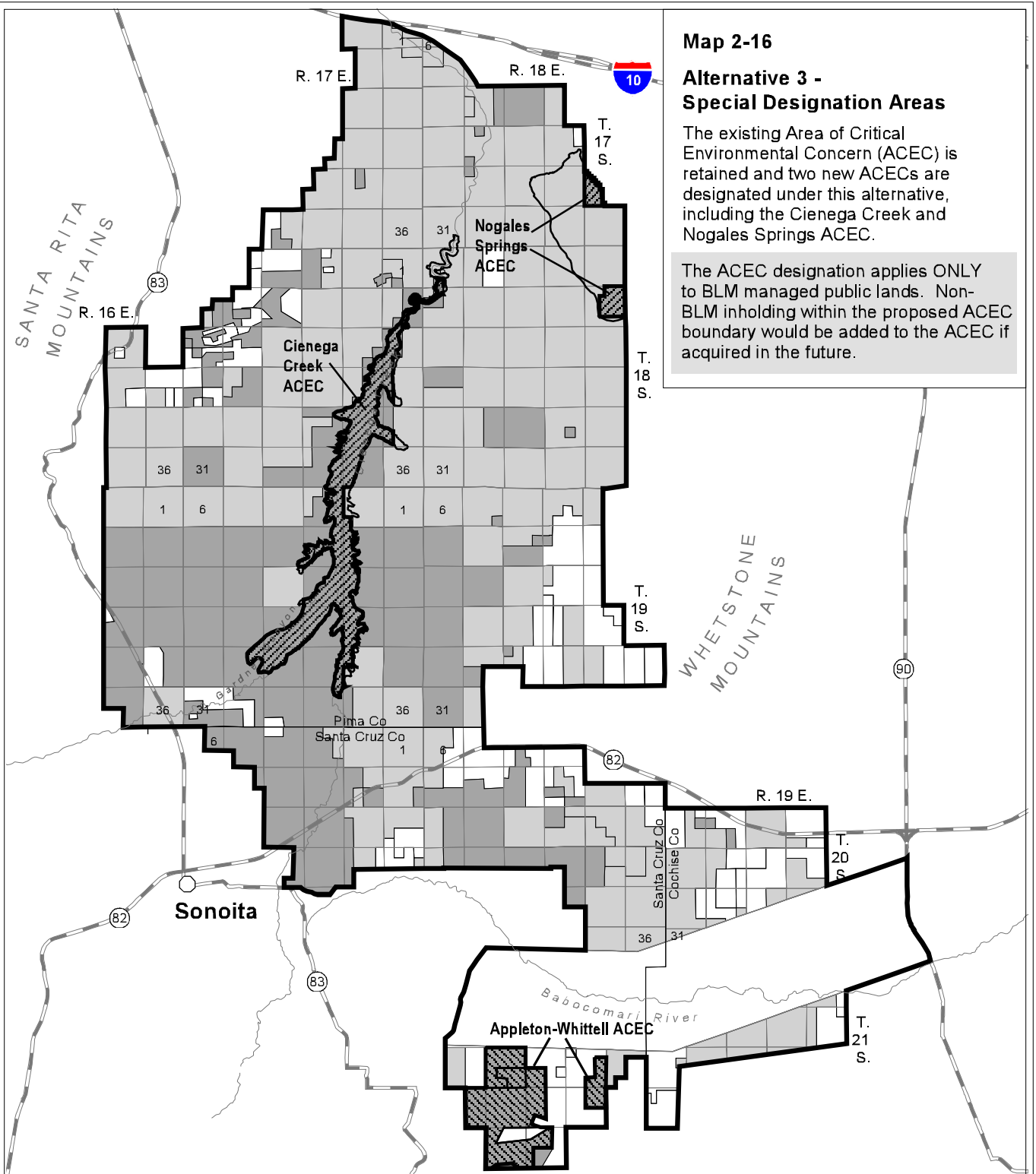
- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Existing Road
- Arizona Trail Route

**Map 2-16**

**Alternative 3 -  
Special Designation Areas**

The existing Area of Critical Environmental Concern (ACEC) is retained and two new ACECs are designated under this alternative, including the Cienega Creek and Nogales Springs ACEC.

The ACEC designation applies ONLY to BLM managed public lands. Non-BLM inholding within the proposed ACEC boundary would be added to the ACEC if acquired in the future.



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- ▨ Proposed ACEC
- ▩ Existing ACEC

Wild and Scenic Rivers

Continue to manage the Cienega Creek Wild and Scenic Rivers Study Area to protect the resources pending congressional action on designation.

*(Common to All Alternatives)*

**Land Tenure**

Public lands in Las Cienegas NCA would be retained and additional public lands or easements would be acquired within the Sonoita Valley Acquisition Planning District according to the prescriptions in the Las Cienegas RMP/EIS Acquisition Strategy (See Appendix 2). The Acquisition Strategy includes criteria for prioritizing acquisitions and identifies both traditional and non-traditional means of acquisition from the NCA Act and other legislation.

Public lands which become contiguous with the NCA due to acquisitions of intermixed lands become part of the NCA. Acquisitions within the Sonoita Valley Acquisition Planning District become part of the NCA upon acquisition. Any acquisitions of lands or easements inside the planning area (Empire-Cienega Long-Term Management Area), but outside the Sonoita Valley Acquisition Planning District would be completed according to objectives and management prescriptions in the Safford RMP Land Tenure Plan Amendment (summarized in the Management Guidance section of Appendix 2.) *(Common to Alternatives 2, 3, and 4)*

**Alternative 4--Land Use Plan Proposals**

Emphasizing land use closures and restrictions and limits on development as the approach to achieving desired resource conditions, Alternative 4 is the most restrictive of the alternatives. It would provide for the following:

- Public lands would remain closed to mining and would be closed to livestock grazing.

- All public lands would be designated as an area of critical environmental concern.
- A single utility corridor would be designated for major utility lines.
- The Arizona Trail corridor would use the existing road system and require shared use of motorized and non-motorized travel.
- More roads would be closed or restricted than under any other alternative.
- Both mechanized and motorized vehicles would be restricted to designated routes.
- Recreation developments would be limited to the smallest area.
- More area would be designated as recreation Zone 3—open to dispersed recreation with fewer restrictions—than under any other alternative.

**Desired Resource Conditions**

Under Alternative 4, BLM would do the following to meet desired resource conditions:

Watershed: Upland, Riparian, and Aquatic Management

Apply management to meet and maintain the goals and objectives (desired future conditions) for upland vegetation, riparian vegetation, and aquatic habitats as described for Alternative 2. *(Common to Alternatives 2, 3, and 4)*

Fish and Wildlife Management

Apply management to meet and maintain the goals and objectives (desired future conditions) for fish and wildlife and place management emphasis on the four rare habitats that support 18 priority species as described for Alternative 2.

*(Common to Alternatives 2, 3, and 4)*



## Chapter 2: Part A—Land Use Alternatives

### Visual Resource Management

Designate 49,000 acres of public land as visual resource management (VRM) Class II (See Appendix 2-Visual Resource Management Class Objectives).

*(Common to Alternatives 2, 3, and 4)*

### Cultural Resource Management

Under Alternative 4, management of cultural resources in the planning area would be the same as under Alternative 1.

### Recreation Management

Manage to maintain three recreation opportunity settings on public lands as described for Alternative 2.

*(Common to Alternatives 2, 3, and 4)*

### Land Use Allocations

Under Alternative 4, BLM would make the following land use allocations:

### Fish and Wildlife Management

Manage suitable public land habitats for the recovery or reestablishing of native populations in collaboration with federal and state agencies, user groups, and other interested parties.

Provide for reintroducing Gila topminnow into suitable habitats in accord with the existing BLM-AGFD Memorandum of Understanding. In addition, provide for reintroducing the following endangered, threatened, candidate, and priority species in accord with existing regulations, policies, and agreements:

*(Common to Alternatives 2, 3, and 4)*

- Gila chub
- Desert pupfish
- Southwestern willow flycatcher
- Aplomado falcon
- Native leopard frogs
- Black-tailed prairie dog
- Beaver
- Pronghorn
- Gould's turkey

### Wildland Fire Management

BLM will suppress all natural or human-caused

wildland fires by first addressing safety concerns to firefighters and the public and then addressing resource concerns. Because of the planning area's small size, and the proximity of an increasing number of homes in the wildland-urban interface, BLM has determined that it will not manage unplanned ignitions for the benefit of resources **only once public safety and property protection can be assured and in conformance with the RMP. Due to intermixed land ownership patterns, BLM will pursue development of and utilize a multi-agency fire management strategy in the planning area which will consider both ecological and administrative issues.**

*(Common to All Alternatives).*

### Mineral Development

Under Alternative 4, the 48,542 acres of acquired public land and any future acquired public land would remain closed to locatable and leasable mineral exploration and development and mineral material sales (See Map 2-4). In addition, BLM would petition to withdraw the following from mineral location and leasing:

- 458 acres of public domain lands in the Empire Mountains.
- ~~4,474~~ **5,726.86** acres of federal mineral estate with private surface.
- 1,440 acres of federal mineral estate with state surface.

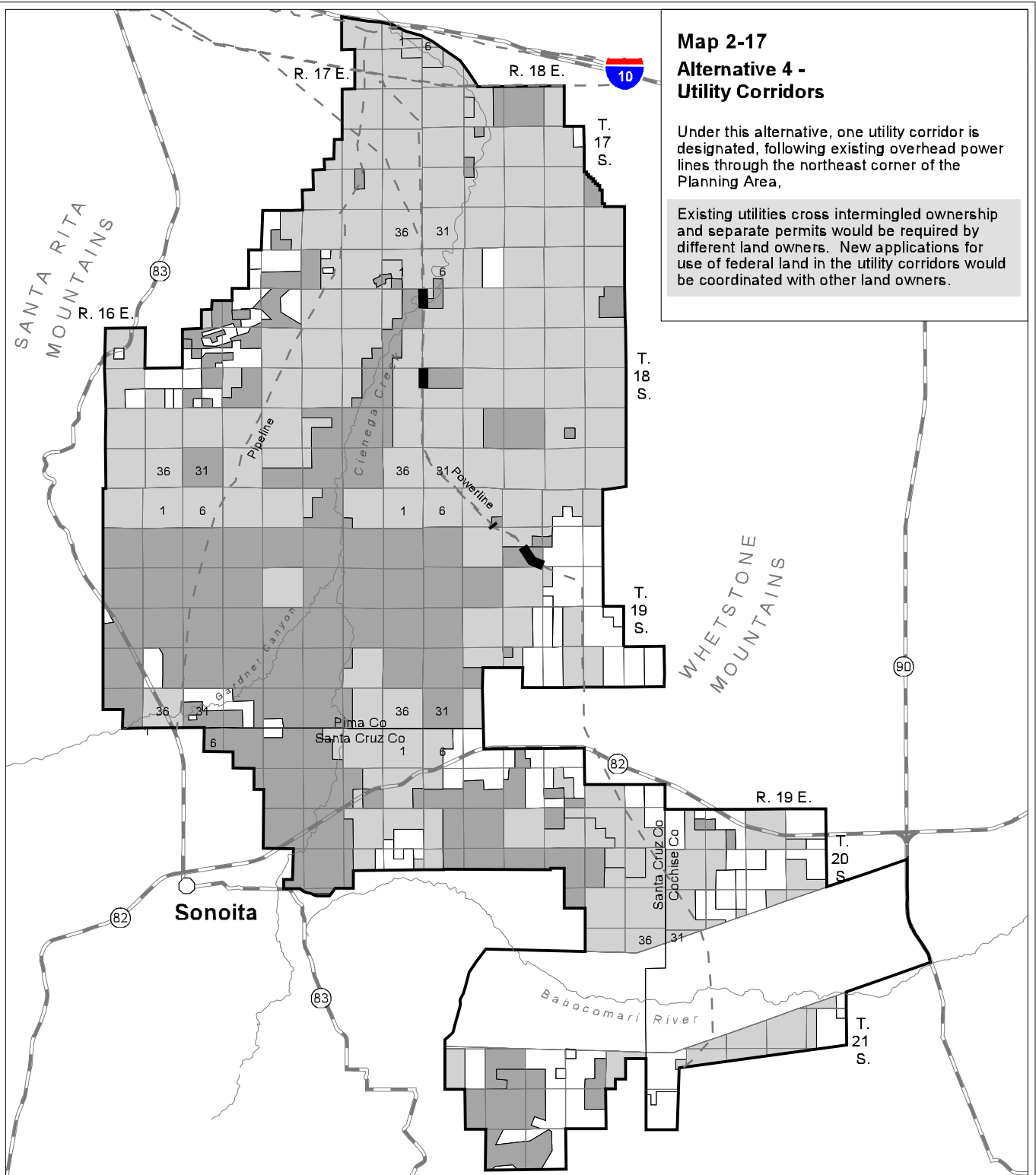
### Utility Corridors

Designate one major utility corridor across public lands in the northeast part of the planning area (Map 2-17). This ~~1/8-mile~~ **500-foot**-wide corridor for overhead utility lines already has two such lines. **No new lines can be placed west and south of Mattie Canyon. Any proposed new lines would need to be placed within this corridor and east of the existing lines.** Because of the configuration of the public land corridor

**Map 2-17**  
**Alternative 4 -**  
**Utility Corridors**

Under this alternative, one utility corridor is designated, following existing overhead power lines through the northeast corner of the Planning Area,

Existing utilities cross intermingled ownership and separate permits would be required by different land owners. New applications for use of federal land in the utility corridors would be coordinated with other land owners.



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Existing Utility Line
- Designated Utility Corridor

and presence of intermixed State Trust Lands, the utility would also need to obtain a right-of-way from the Arizona State Land Department.

#### **Land Use Permits**

BLM would continue to consider other land use authorizations on a case-by-case basis with stipulations to any permits or leases to ensure consistency with the plan's goals and objectives.

#### **Off-Highway Vehicle Management**

Limit both motorized and mechanized vehicles to designated roads and trails on the 49,000 acres of public land according to the designated transportation system (Map 2-18).

*(Common to All Alternatives)*

Under Alternative 4, BLM would make the following route designations on public lands to **implement the Off-Highway Vehicle designation of Limited to Designated Roads (Map 2-18):**

- ~~86.8~~ **83.9** miles open for public motorized travel.
- **0.4 miles of new road would be constructed as a bypass at the Empire Ranch Headquarters.**
- ~~1.1~~ **0.9** miles open seasonally for public motorized travel.
- ~~28.5~~ **30.2** miles designated for administrative use only.
- 0 miles converted to non-motorized trail for travel by mechanized vehicle, horse, or foot.
- ~~27.6~~ **25.5** miles closed and rehabilitated.

**Roads designated as administrative use only may be opened temporarily for public use if needed to provide alternate access. This could**

**occur if a route designated open for public use has to be closed temporarily for resource or public safety concerns.**

In addition to the above miles of roads and trails, the designated transportation system will also include the *Heritage Discovery Trail* (a hardened interpretive trail at the Empire Ranch Headquarters, which is described under the Cultural Resource Management section of the **Alternative 2 Activity Plan Management Actions (Common to Alternatives 2, 3, and 4)**)

~~In addition, BLM will recommend to the Arizona State Land Department that similar designations be considered for the segments of these roads that cross intermixed State Trust Lands.~~ **For lands acquired in the future, road designations on intermixed non-BLM lands (shown on Map 2-18 as dashed lines) would be implemented for consistent management. Route designations on other surrounding lands in the Acquisition Planning District which may be acquired in the future by BLM, would be determined through a public process after acquisition.**










Legal public access has not been secured to many of the ~~86.8~~ **83.9** miles of public land roads, that Alternative 4 would designate as open. In the future, other landowners could close access on some roads or portions of roads. In addition, BLM might close roads or portions of roads seasonally, temporarily, or in emergencies where hazard or resource conditions warrant. To address resource or management concerns BLM might also build new road segments to replace existing roads. As described under the **Activity Plan Management Actions** for Alternative 2, BLM would pursue legal public access on four road segments crossing Arizona State Trust Lands. *(Common to Alternatives 2, 3, and 4)*

# FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN








## Map 2-18 North Half Alternative 4- Route Designations

This map shows the use designations pursuant to 43 CFR 8342 for routes on BLM administered lands to provide access and meet resource management objectives under this alternative.

Existing roads across State Trust lands and private lands are shown for reference only. These routes may not have legal public access and they may or may not be open to public use in the future.

-  Planning Area Boundary
- BLM Route Designations:**
  -  Open to All Motorized Travel Year-Round
  -  Open to All Motorized Travel: July 1 to March 31
  -  Open to Administrative Motor Vehicle Use Only.
  -  Open to Non-Motorized Public Travel Year-Round
  -  Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
  -  Closed to All Travel. Obliterate and Revegetate.
  -  Routes Across Non-Federal land, not subject to BLM use designations.
  -  New Road Construction

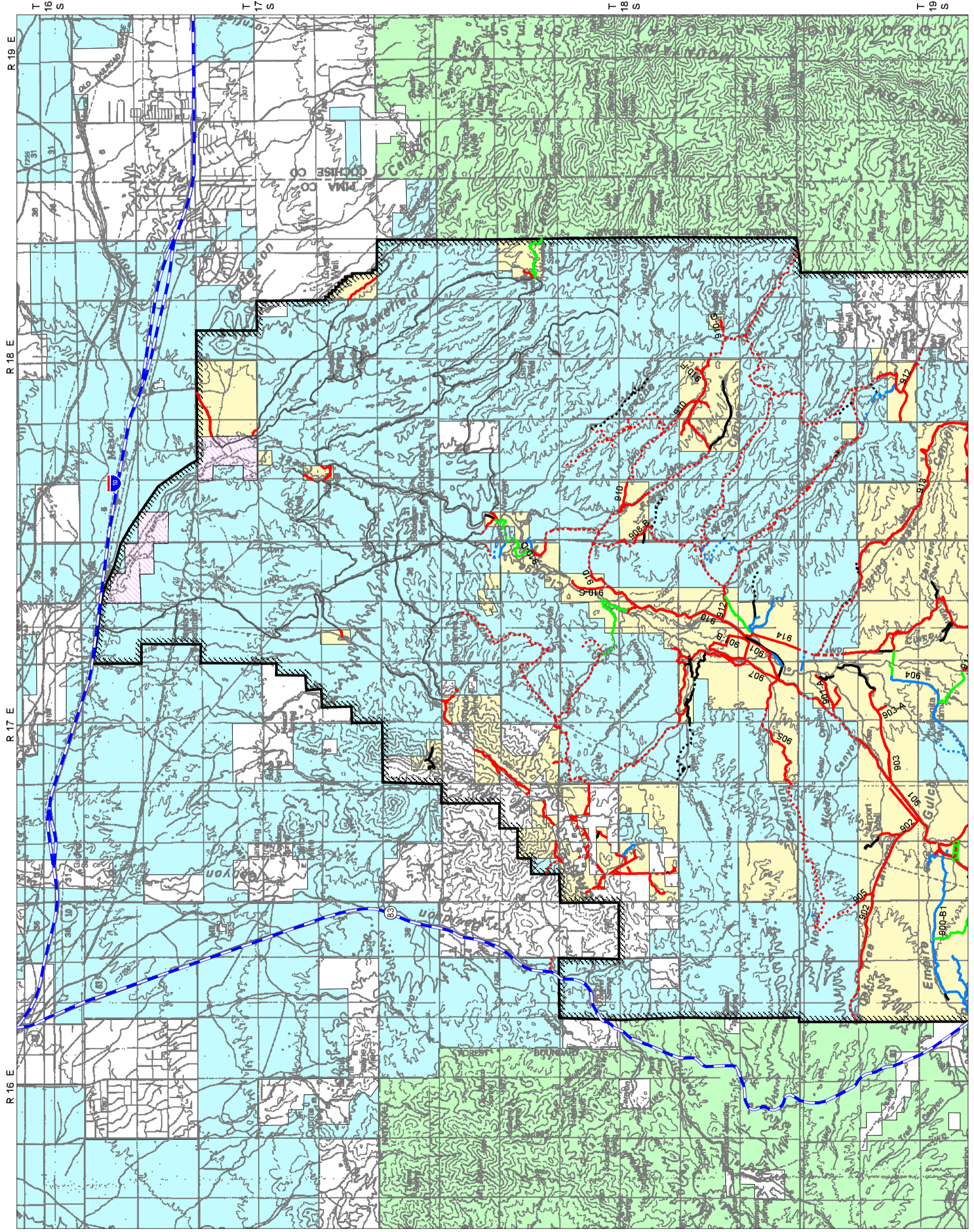
### Route Designations if Non-federal Land is Acquired:

-  Open to All Motorized Travel Year-Round
-  Open to All Motorized Travel: July 1 to March 31
-  Open to Administrative Motor Vehicle Use Only.
-  Open to Non-Motorized Public Travel Year-Round
-  Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
-  Closed to All Travel. Obliterate and Revegetate.
-  Routes Across Other Non-Federal land, not subject to BLM use designations.

Proposed route designations for non-Federal lands are for reference, showing how BLM would designate these when and if they are acquired. Designations for other undesignated routes in the Acquisition Planning District would be through a public process after acquisition.

-  Bureau of Land Management
-  State Land Department
-  National Forest
-  County Land
-  Military Land
-  Private

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













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





## Map 2-18 South Half Alternative 4- Route Designations

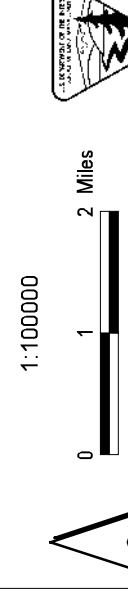
This map shows the use designations pursuant to 43 CFR 8342 for routes on BLM administered lands to provide access and meet resource management objectives under this alternative.

Existing roads across State Trust lands and private lands are shown for reference only. These routes may not have legal public access and they may or may not be open to public use in the future.

-  Planning Area Boundary
- BLM Route Designations:**
  -  Open to All Motorized Travel Year-Round
  -  Open to All Motorized Travel: July 1 to March 31
  -  Open to Administrative Motor Vehicle Use Only.
  -  Open to Non-Motorized Public Travel Year-Round
  -  Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
  -  Closed to All Travel. Obliterate and Revegetate.
  -  Routes Across Non-Federal land, not subject to BLM use designations.
  -  New Road Construction
- Route Designations if Non-federal Land is Acquired:**
  -  Open to All Motorized Travel Year-Round
  -  Open to All Motorized Travel: July 1 to March 31
  -  Open to Administrative Motor Vehicle Use Only.
  -  Open to Non-Motorized Public Travel Year-Round
  -  Closed to All Motorized Travel. Open to Non-Motorized Travel Year-Round
  -  Closed to All Travel. Obliterate and Revegetate.
  -  Routes Across Other Non-Federal land, not subject to BLM use designations.

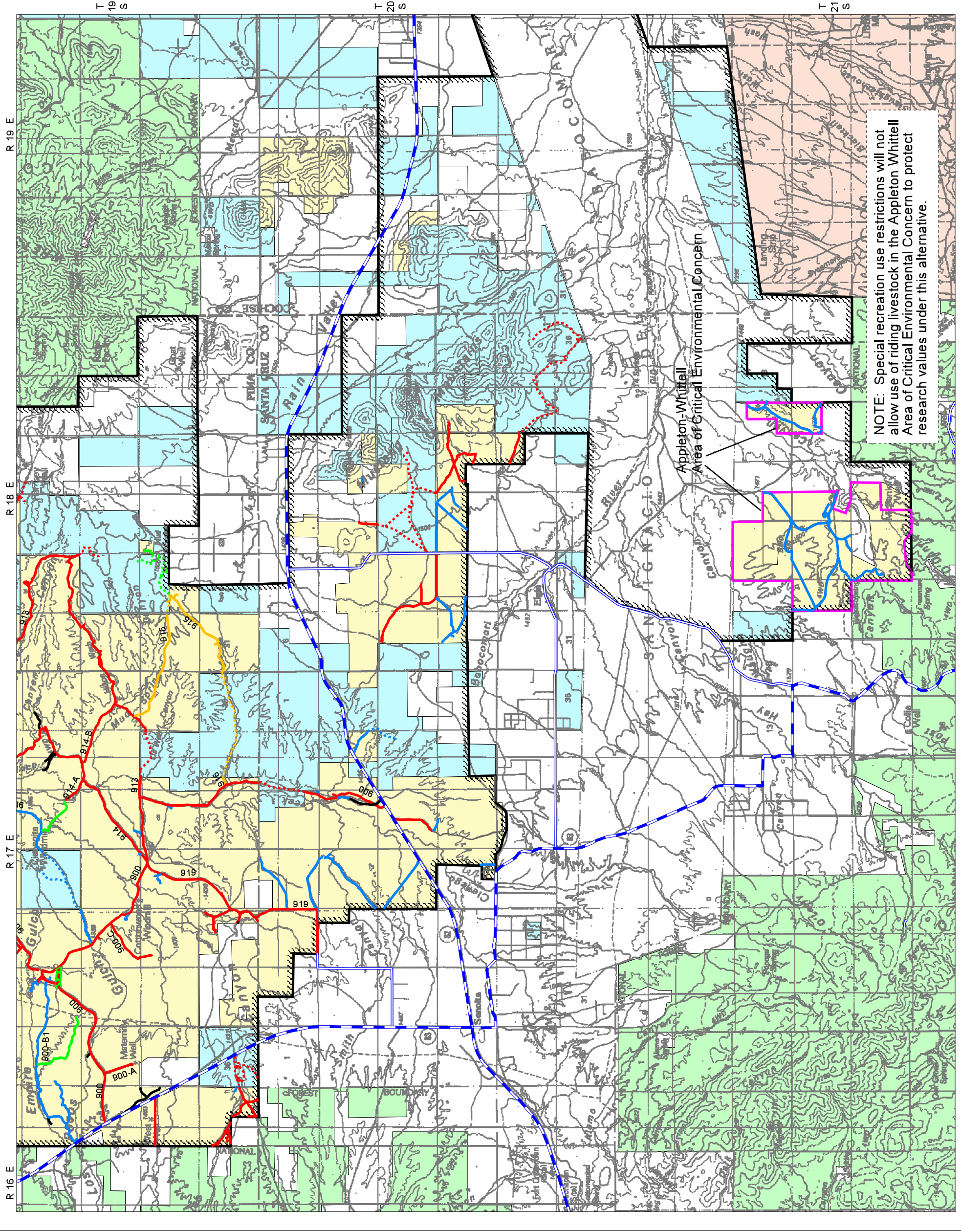
Proposed route designations for non-Federal lands are for reference, showing how BLM would designate these when and if they are acquired. Designations for other undesignated routes in the Acquisition Planning District would be through a public process after acquisition.

-  Bureau of Land Management
-  State Land Department
-  National Forest
-  County Land
-  Military Land
-  Private



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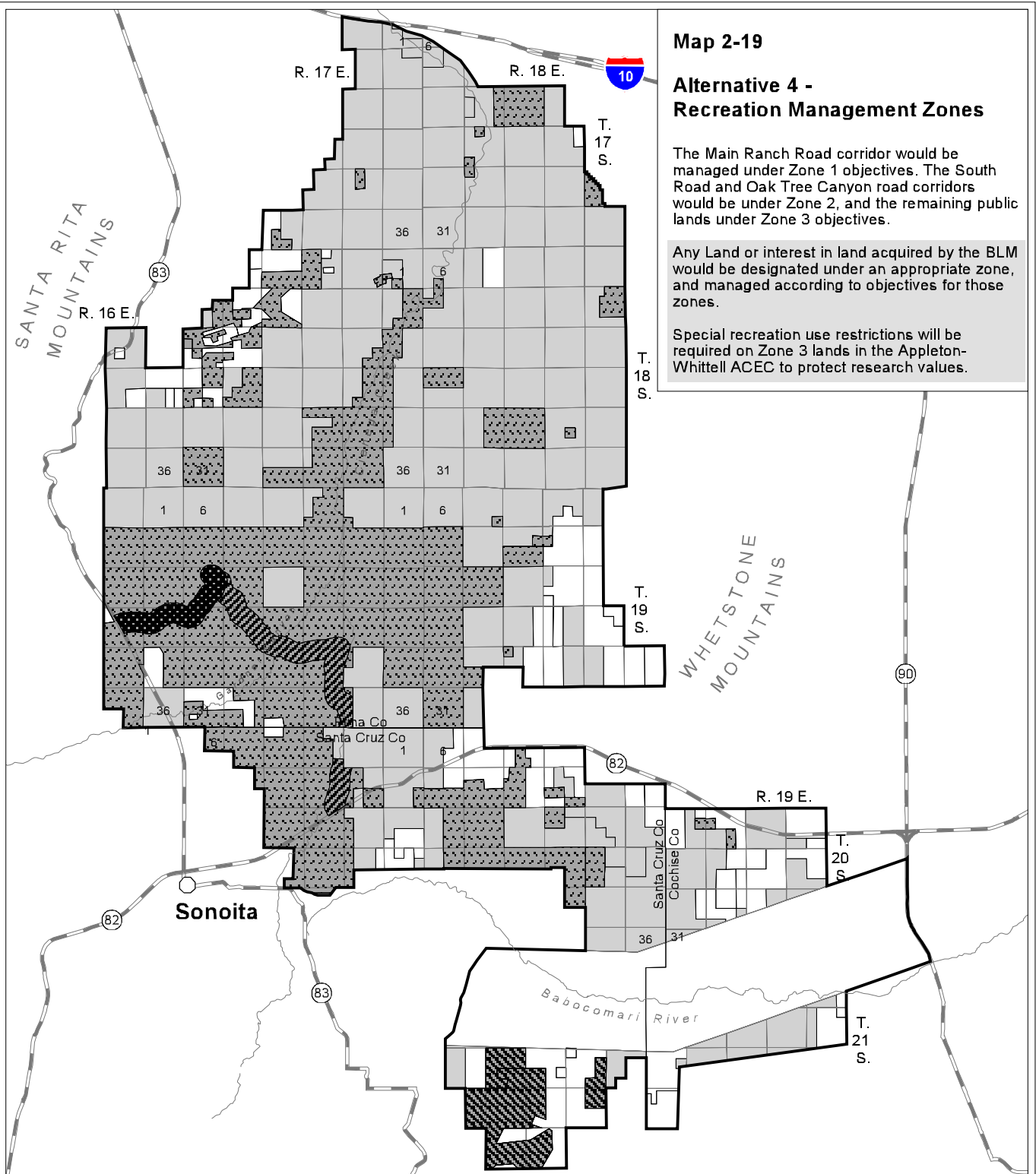
**Map 2-19**

**Alternative 4 -  
Recreation Management Zones**

The Main Ranch Road corridor would be managed under Zone 1 objectives. The South Road and Oak Tree Canyon road corridors would be under Zone 2, and the remaining public lands under Zone 3 objectives.

Any Land or interest in land acquired by the BLM would be designated under an appropriate zone, and managed according to objectives for those zones.

Special recreation use restrictions will be required on Zone 3 lands in the Appleton-Whittell ACEC to protect research values.



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Zone 1
- Zone 2
- Zone 3
- Special Restriction Area

## Chapter 2: Part A—Land Use Alternatives

### Recreation Management

Establish three recreation zones on public lands within the planning area (Map 2-19), and manage them to conform to the three recreation opportunity settings described in Table 2-7 (Desired Resource Conditions) and in accord with the desired recreation goals and objective (**Common to Alternatives 2, 3, and 4**).

The ~~Activity Plan~~ **Management Actions** for Alternative 4 describe in more detail the recreation management within these zones. The size, location, and configuration of Zone 1 would be the same under Alternatives 2, 3, and 4.

- Zone 1 (Roaded Natural) would offer developed, concentrated activities for a wide range of visitor types. It would have easy access with visitor, interpretive, and educational facilities and would generally allow day use but no public camping. Motorized traffic would be directed to use designated parking, pullouts, and a loop drive. Recreation Zone 1 would consist of a half-mile-wide corridor along the entrance road (from Highway 83 to ranch headquarters). This zone would include ranch headquarters and Empire Gulch Spring and would encompass 1,109 acres of public land. (**Common to Alternatives 2, 3, and 4**)
- Zone 2 (Natural) would offer moderate access with infrequently maintained roads, concentrated visitor use in designated areas (i.e., camping, parking, pullouts, and group sites) and limited visitor facilities and interpretation. Recreation Zone 2, a half-mile corridor along South Road, would consist of 2,161 acres of public land.
- Zone 3 (Back Country/Semi-Primitive) would offer a low concentration of visitors and a predominately natural environment, variable access that would likely be difficult, low to no visitor facilities, limited signs, and dispersed low-impact recreational opportunities. Under

Alternative 4, Recreation Zone 3 would include the rest of the planning area's public lands--45,730 acres.

### Arizona Trail

Designate a corridor for the Arizona Trail along eight miles of existing roads on public lands (Map 2-20). The trail would be shared use (motorized and non-motorized), and no new trail would need to be built. To have a continuous trail, the corridor would also have to cross 6.5 miles of existing road on intermingled State Trust Lands. For the trail to cross State Trust Land, a right-of-way must be obtained from the Arizona State Land Department.

### Livestock Grazing Management

BLM would not allocate forage for livestock grazing on public lands within four existing allotments. Livestock grazing leases would be canceled on 41,855 acres currently leased for grazing (See Table 2-11) **and the removal of livestock would be phased in as grazing leases come up for renewal. The livestock grazing management actions for Alternative 4 describe in more detail how livestock removal would be implemented.**

### Special Designation Areas

Under Alternative 4, BLM would make the following special designations:

#### Area of Critical Environmental Concern

Designate 45,859 acres of public lands as the Empire-Cienega ACEC (See Map 2-10). This ACEC would include all of the public lands within the planning area except the 3,141 acres of public lands now within the Appleton-Whittell ACEC (Research Ranch), which would remain a separate ACEC but be renamed the Appleton-Whittell Research ACEC. Appendix 2 includes full descriptions of the ACECs.

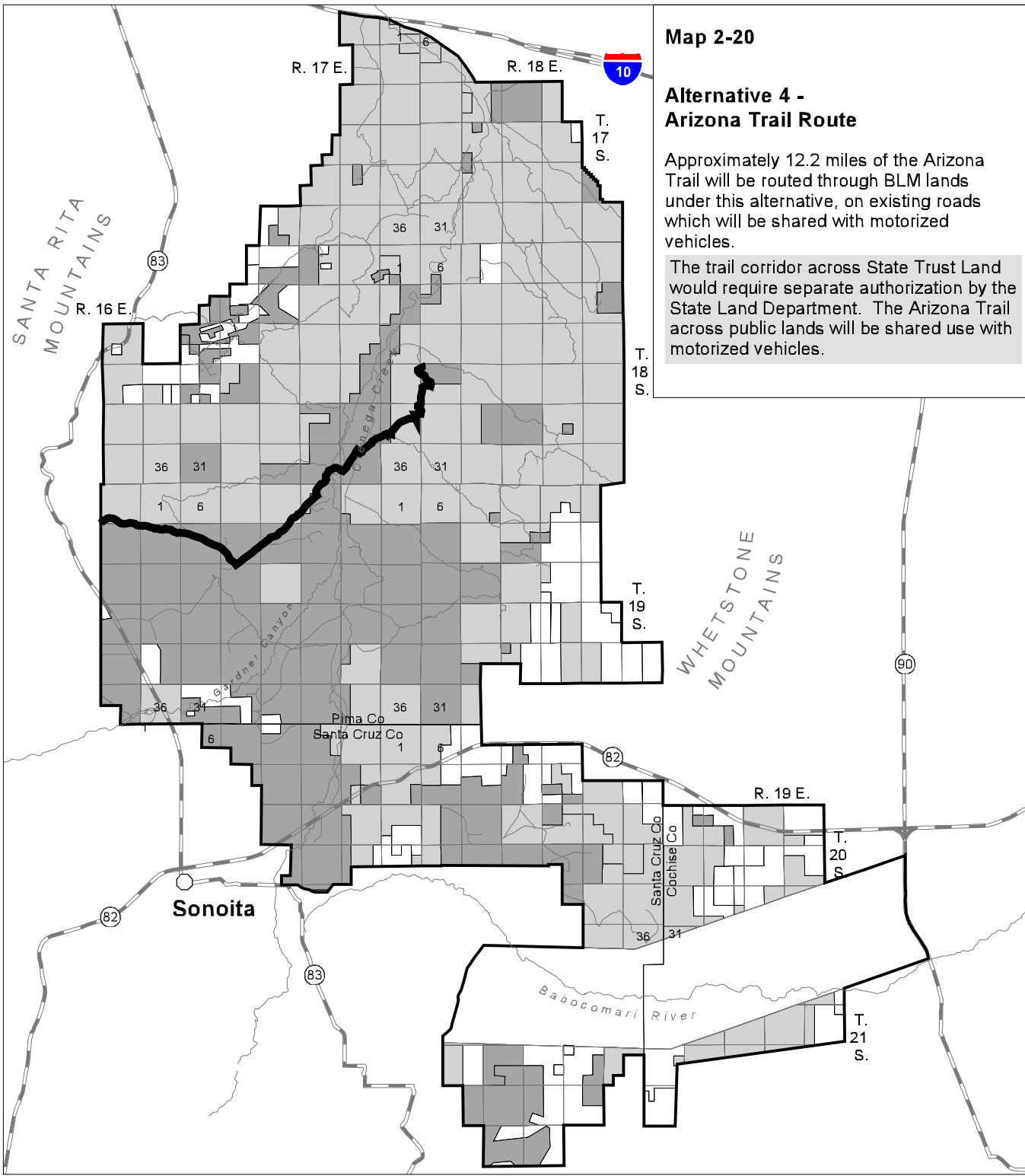
~~Any State Trust and private lands acquired in the future within ACEC boundaries would be incorporated into the ACEC(s) and managed according to the prescriptions of this plan~~

**Map 2-20**


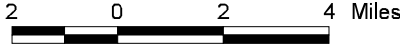

**Alternative 4 -  
Arizona Trail Route**

Approximately 12.2 miles of the Arizona Trail will be routed through BLM lands under this alternative, on existing roads which will be shared with motorized vehicles.

The trail corridor across State Trust Land would require separate authorization by the State Land Department. The Arizona Trail across public lands will be shared use with motorized vehicles.









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**LEGEND**

-  Planning Area Boundary
-  BLM Land
-  State Land
-  Private Land
-  Existing Road
-  Arizona Trail Route

April 2002



**Table 2-11  
Livestock Grazing Leases to Be Canceled Under Alternative 4  
Las Cienegas Resource Management Plan**

Allotment	Total Acres	Total Acres Grazed	BLM Acres	BLM Acres Grazed	ASLD Acres	Private Acres
Empire-Cienega (6090)	74,146	37,462	36,684	0	37,462	0
Empirita (6210)	24,988	23,468	1,520	0	23,468	0
Rose Tree (6043)	8,869	4,919	3,950	0	3,719	1,200
Vera Earl (6129)	1,440	0	1,440	0	0	N/A
<b>TOTAL:</b>	<b>109,443</b>	<b>65,849</b>	<b>41,855</b>	<b>0</b>	<b>64,649</b>	<b>1,200</b>

Any State Trust and private lands acquired in the future within the planning area ACEC boundaries north of the Babocomari Land Grant would be incorporated into the Empire-Cienega ACEC and managed according to the prescriptions of this plan.

Any State Trust and private lands acquired in the future within the Sonoita Valley APD boundary south of the Babocomari Land Grant would be incorporated into the Appleton-Whittell Research ACEC, and managed for research values according to the prescriptions of this plan.

The Activity Plan for The Alternative 4 plan, including desired conditions, land use allocations, special designations, land tenure decisions and management actions, is the proposed management plan for the Empire-Cienega ACEC, including management actions common to Alternatives 2, 3, and 4 and actions specific to Alternative 4.

Wild and Scenic Rivers

Continue to manage the Cienega Creek Wild and Scenic Rivers Study Area to protect the

resources pending congressional action on designation.

*(Common to All Alternatives)*

Land Tenure

Public lands in Las Cienegas NCA to be retained and additional public lands or easements to be acquired within the Sonoita Valley Acquisition Planning District according to the prescriptions in the Las Cienegas RMP/EIS Acquisition Strategy (See Appendix 2). The Acquisition Strategy includes criteria for prioritizing acquisitions and identifies both traditional and non-traditional means of acquisition from the NCA Act and other legislation.

Public lands which become contiguous with the NCA due to acquisitions of intermixed lands become part of the NCA. Acquisitions within the Sonoita Valley Acquisition Planning District become part of the NCA upon acquisition.

Any acquisitions of lands or easements inside the planning area (Empire-Cienega Long-Term Management Area), but outside the Sonoita

Valley Acquisition Planning District, would be completed according to objectives and management prescriptions in the Safford RMP Land Tenure Plan Amendment. (summarized in the Management Guidance section of Appendix 2.) (Common to Alternatives 2, 3, and 4)

## **PART B--ACTIVITY PLAN ALTERNATIVES MANAGEMENT ACTIONS**

This section includes the four interdisciplinary activity plans sets of management actions that would be implemented under each of the land use plan alternatives. The Activity Plan Management Actions for Alternative 1 is are limited to the existing interim grazing plan and project-by-project considerations for other resource programs, including cultural resources, wildlife, and recreation. The activity plans Management Actions for Alternatives 2, 3, and 4 have in common include a common series of actions to meet the desired resource conditions for upland and riparian vegetation, wildlife habitats, and cultural and visual resources. The activity plans Management Actions for Alternatives 2, 3, and 4 vary mainly by the proposals for implementing livestock grazing decisions and recreation management. The first part of the Activity Plan Management Actions sections for Alternative 2 describes and includes the proposals Management Actions common to Alternatives 2, 3, and 4. The activity plans Management Actions sections for Alternatives 3 and 4 refer the reader to Alternative 2 for the text of proposals Management Actions common to the three alternatives.

### **Alternative 1--Activity Plan Management Actions**

The following actions, which describe ongoing management in the Empire-Cienega Planning Area, constitutes the Activity Plan Management Actions for Alternative 1 (Current

### *Watershed Management Actions - Alternative 1*

Management). If Alternative 1 is selected, the assumption is that the following management approaches and level of management would continue.

### *Watershed: Upland, Riparian, and Aquatic Management Actions*

Under Alternative 1, BLM would carry out the following actions in managing and restoring watersheds:

- . Consider vegetation treatments on a case-by-case basis to address specific resource issues. An integrated vegetation treatment program would not be developed.
- . Issue free use permits on a case-by-case basis for collecting plant materials for noncommercial use.
- . Control livestock use of riparian areas by building riparian fencing.
- . Repair eroding streambanks and other disturbed areas as significant problems are detected.
- . Include stipulations for group activity permits to reduce impacts to riparian areas, including limiting creek crossings to dry or designated crossing areas.

### *Fish and Wildlife Management Actions*

Under Alternative 1, BLM would continue to carry out the following actions in managing fish and wildlife:

- . Use the Section 7 consultation process with the U.S. Fish and Wildlife Service to ensure that actions undertaken do not jeopardize the existence of endangered or threatened species or species proposed for listing. *(Common to All Alternatives)*
- . Continue to implement the terms and conditions in existing biological opinions,

*Chapter 2: Part B - Management Actions*

including the following (See Appendix 2 for more detail):

- a. Ensure that livestock grazing on BLM-administered lands adheres to the BLM's Arizona Standards and Guidelines, Upland Livestock Utilization Standard, Safford Drought Policy, Arizona Ephemeral policy, and Riparian Area Policy.
- b. Work with other landowners to achieve a long-term upward trend in areas with fair or poor range condition.
- c. Work with the Natural Resource Conservation Service and landowners in the allotments to develop and implement watershed improvement projects that will increase infiltration.
- d. Continue to implement the following measures to protect lesser long-nosed bat roosts and foraging habitat from grazing impacts:  
Ensure that road building and maintenance activities do not increase or facilitate public access to known day roosts of lesser long-nosed bats.
  - Conduct pre-construction surveys for paniculate agaves to avoid or minimize their injury and mortality during construction.
  - Design vegetation treatments, including prescribed fire, to minimize harm to paniculate agave and to ensure that no more than 20% of agaves that are burned during prescribed fire are killed by the fire.
  - Develop a mitigation plan in coordination with the Fish and Wildlife Service for any vegetation treatment, including prescribed fire

within 0.5 mi of a bat roost or in areas that support paniculate agaves.

- . Continue to implement the following measures to protect jaguar and jaguar habitat from grazing impacts.
  - Maintain dense, low vegetation in the Cienega Creek riparian corridor for jaguar.
  - Do not subject jaguar to any predator control activities.
  - Investigate all reports of observations of jaguars in coordination with the Fish and Wildlife Service and the Arizona Game and Fish Department.
- . Continue to implement the following measures to protect populations of topminnow and topminnow habitat from grazing impacts:
  - Exclude riparian areas from grazing.
  - Rotate use of crossing lanes and move cattle through them within 10 days.
  - Continue developing adjacent upland waters and phasing out water gaps.
  - Inspect and maintain riparian enclosure fences at least twice annually.
  - Locate all new repressos (i.e., earthen stock ponds) to minimize the likelihood of floods or humans moving exotic fish and bullfrogs into topminnow habitat.
  - Use repressos only when required to water cattle and allow repressos to dry when no longer needed to water cattle. Drain repressos if they do not dry within six months after their use ends. **The BLM would be responsible for any**

**required draining of repressos not related to the livestock operation.**

- Monitor the fish community and habitat, including crossing lanes, grazed riparian zones, and repressos to document the level of incidental take and to check for introduction of exotic fish and bullfrogs.
- Ensure that any changes in livestock management do not increase cattle use at Nogales and Little Nogales Springs or along Cienega Creek.
- Develop mitigation plans in coordination with the Fish and Wildlife Service for range improvements and vegetation treatments which may harm the topminnow or its habitat.

Continue to implement the following measures to protect the Southwestern willow flycatcher and its habitat from grazing impacts:

- Exclude livestock grazing from occupied or unsurveyed, suitable habitat during the Southwestern willow flycatcher breeding season (Apr 1-Sept.1).
- Manage suitable willow flycatcher habitat so that its suitable characteristics are not eliminated or degraded.
- Manage potential willow flycatcher habitat to allow natural regeneration into suitable habitat as rapidly as possible.
- Control cowbirds within five miles of occupied habitat using suitable control methods, if cowbird concentrations indicate a strong likelihood that parasitism to flycatcher nests is

occurring or if parasitism of a nest is documented.

- Do not authorize livestock management activities, including development of range improvements in the riparian zone of unsurveyed, suitable, or occupied willow flycatcher habitat during the willow flycatcher breeding season.

Locate any new livestock management facilities that are likely to attract and support cowbirds more than five miles from occupied, suitable, or potential flycatcher habitat, unless such facilities are crucial to protecting of the riparian habitat and cowbird trapping is implemented to counteract the effect of the facility.

- Cooperate with state and federal agencies, universities, conservation groups, and other organizations on proposals, including fish and wildlife research, fish and wildlife habitat improvement projects, inventory and monitoring of species and habitats, and mitigation of impacts from other activities. **(Common to All Alternatives)**

Some wildlife actions under current management have included the following:

- Modifying and removing fences for pronghorn in selected areas.
- Providing permanent water for wildlife at livestock developments.
- Studying grassland sparrows, grasshoppers, native fish, and vegetation.
- Accomplish some proposed actions from the Gila Topminnow Recovery Plan as BLM obtains the resources. Actions under current management have included the following:

## Chapter 2: Part B - Management Actions

- . Partial inventory of stock tanks for exotic fishes and amphibians in portions of the Cienega Creek watershed.
- . Closing some road crossings on perennial portions of Cienega Creek.
- . Preliminary evaluation of sites for reintroduction areas.

### **Cultural Resource Management Actions**

Management under Alternative 1 would allow cultural resources in the planning area to be conserved for future values or used for scientific, public, or socio-cultural purposes through the following actions:

#### **Empire Ranch Headquarters**

1. Allocate the historically significant buildings at the Empire Ranch Headquarters to public use. (*Common to All Alternatives*)
2. Produce a cultural resource project plan (CRPP) in the form of a “master plan” for the Empire Ranch Headquarters. Under Alternative 1, the Empire Ranch House would be stabilized, but not restored. Public and educational programs would continue to consist of tours, presentations, occasional open houses, and special events. Learn-and-serve or other training programs would continue. Facilities would be signed for self-guided tours and visitor facilities would be upgraded.
3. Evaluate and submit materials nominating the complex of historic buildings (built or placed before 1950) at the Empire Ranch Headquarters to the National Register of Historic Places by 2003. (The Empire Ranch House is listed on the National Register). (*Common to All Alternatives*)
4. At the Empire Ranch Headquarters continue to conduct basic stabilization/preservation

work on historic buildings that are listed or eligible for listing on the National Register of Historic Places. Grant, partnership, volunteer, and other sources of funding and labor would be used to fund the preservation program. (*Common to All Alternatives*)

5. Stabilize and maintain all eligible or listed historic structures in accord with the Secretary of the Interior’s *Standards and Guidelines for the Treatment of Historic Properties* and *Standards and Guidelines for Rehabilitating Historic Buildings on the National Register*. (*Common to All Alternatives*)
6. Manage and maintain at BLM standards for safety, accessibility, and occupancy buildings and structures within the complex that are not eligible for listing on the National Register of Historic Places, including recreational facilities, storage buildings, sheds, shops, and occupied structures. (*Common to All Alternatives*)
7. Continue partnership with the Empire Ranch Foundation and other interested groups in the following:
  - a. Planning uses of the headquarters complex.
  - b. Stabilizing/preserving structures at the headquarters.
  - c. Collecting, preserving, and interpreting historic information and materials about the Empire Ranch and the surrounding area.
  - d. Volunteer projects.
  - e. Educational programs. (*Common to All Alternatives*)
8. Actively maintain and provide opportunities for the public to volunteer for projects to

preserve, conserve, and study the planning area's cultural resources. (*Common to All Alternatives*)

9. Manage the ranch headquarters to include support of historic ranching operations, administration of BLM programs, and protection in the planning area, and public uses emphasizing education, research, interpretation, and visitation.
10. Continue producing limited interpretive materials (i.e., brochures, website information, news/features) about Empire Ranch history.

#### **Cultural Properties Outside the Headquarters Area**

1. Open selected sites outside the headquarters to scientific and historical study by qualified researchers and scholars. (See Appendix 2 for detailed description of this action).
2. Conduct Class III cultural resource surveys of ~~116.4~~ **113.2** miles of roads and trails leading through the planning area by 2004 (**dependent on adequate funding**). Data from these surveys would be used to make future allocation and use decisions.
3. Conduct Class III cultural resource surveys of about 40,000 acres by 2005 (**dependent on adequate funding**). Data from these surveys would be used to make future allocation and use decisions.
4. Conduct an ethnoecological study of the planning area, complete with report, by ~~2003~~ **2004** (**dependent on adequate funding**). (*Common to All Alternatives*)
5. Work with Native Americans, including the Tohono O'odham Nation, the Hopi Tribe and the San Carlos Apache Tribe to select harvesting areas and allow noncommercial collection of bear grass, cottonwood, acorns and medicinal/ceremonial herbs by ~~2001~~

#### **2003. (Common to All Alternatives)**

#### **Access and Transportation Management Actions**

Under Alternative 1, BLM would carry out the following actions in managing access and transportation:

1. Continue to use BLM-produced information and interpretive materials to describe access to the Empire-Cienega Planning Area at the Highway 82 and 83 access points.
2. Continue partial implementation of a designated road system for the planning area, including partial road numbering, access guide (map), and closing of new wildcat roads, but not complete a comprehensive road system with determinations on open, closed, and restricted roads and road segments.

#### **Recreation Management Actions**

Under Alternative 1, BLM would carry out the following actions in managing outdoor recreation:

1. Issue special recreation use permits on a case-by-case basis according to BLM policies and in compliance with the National Environmental Policy Act.



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- Inform planning area visitors (i.e., persons and groups) that they must obtain recreation permits from the Arizona State Land Department, if they are to engage in any activities on State Trust Lands other than hunting with a valid hunting license. Although BLM states this ASLD requirement in its publications, including the Empire-Cienega Access Guide, many visitors are not aware of the mixed land ownership and that State Trust Lands are not public lands.
- Only infrequently maintain roads, as needed, and as resources are available.

BLM would not develop a recreation management program, including interpretation and maintenance.

### ***Administrative Sites Management Actions***

Designate the Empire Ranch Headquarters (about 80 acres), Hummel Ranch buildings (about 10 acres), Cienega Ranch buildings (about 5 acres), and High Lonesome buildings (about 10 acres) as administrative sites (Map 2-21). Buildings at these sites may be used for a variety of purposes including housing, office space, visitor contact, and ranch management. Within the administrative site boundaries, the areas will be closed to discharge of firearms, camping, and other public uses not provided for in conjunction with the administrative use.

***(Common to All Alternatives)***

### ***Mineral Resources Management Actions***

Alternative 1 would establish no management guidelines for rock collecting or the administrative or casual use of mineral materials.

### ***Livestock Grazing Management Actions***

Under current livestock grazing management in the planning area (Alternative 1), four livestock operators continue to lease public lands on four individual grazing allotments (i.e., Empire-

Cienega, Empirita, Rose Tree, and Vera Earl) (See Table 2-12). Livestock graze a total of 107,704 acres within the four allotments. This total includes 41,855 acres of public lands that are currently authorized for livestock grazing, 64,649 acres of State Trust Lands, and 1,200 acres of private lands. The maximum stocking rate on the four allotments is 2,064 cattle on a year-long basis, according to the existing grazing leases for BLM, State Trust, and private lands. The current authorized use on public lands of 832 cattle on a year-long basis equates to 9,984 animal unit months (AUMs) of forage or 12.6 cows/section. The authorized public land use is 40% of the total livestock that could currently be run on the total acreage within the four allotments, regardless of land ownership.

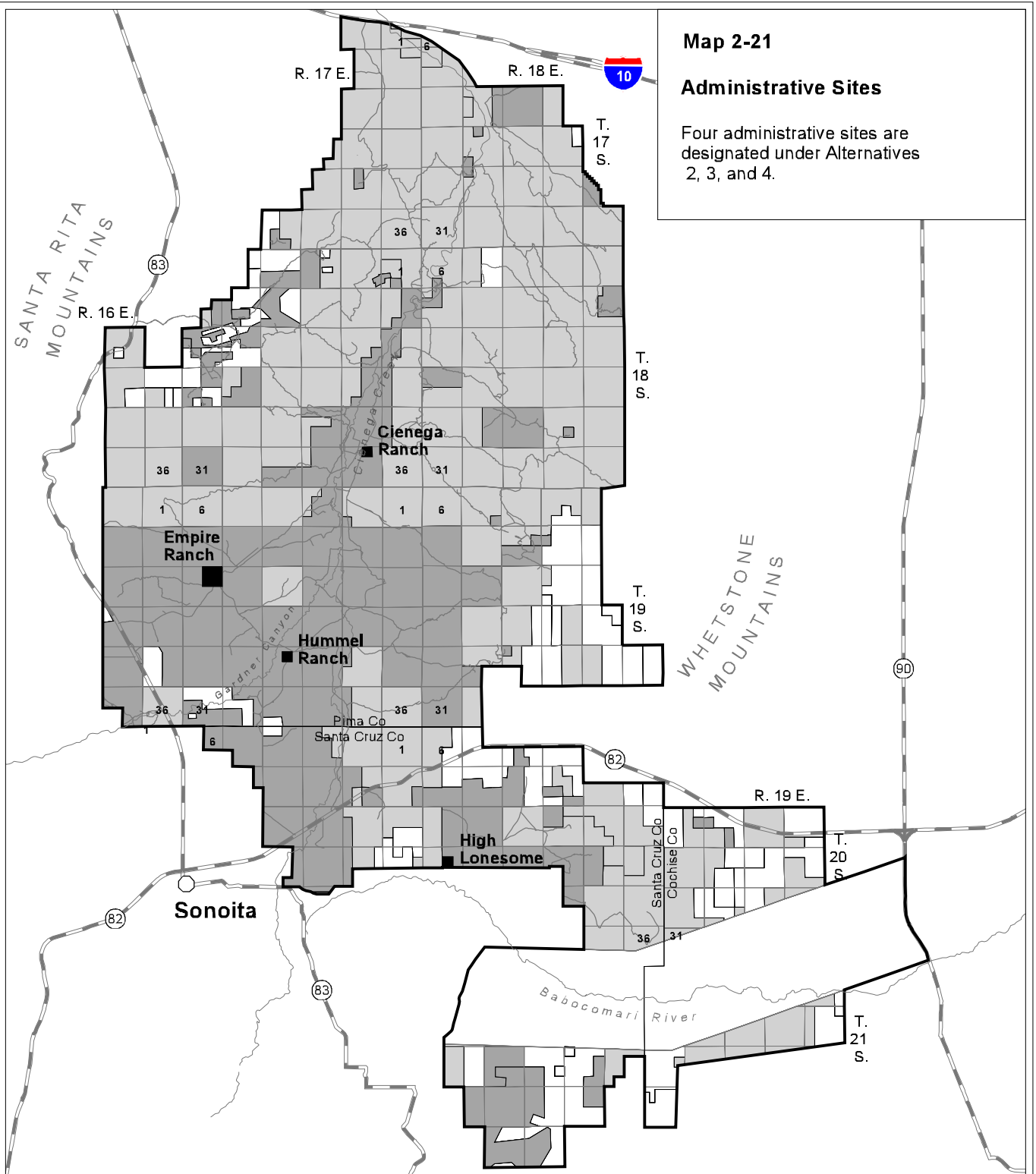
If the four allotments were stocked at the authorized maximum stocking rate of 2,064 cattle every year (which is *technically* allowed under current management), then the percentage of available **useable** forage consumed would approximate 44% in favorable years, 66% in normal years, and 100% in unfavorable years (See Table 2-13). In reality, the public lands in these allotments have never been stocked at the authorized maximum stocking rate. The operators have voluntarily varied the stocking rates on the four allotments because of factors described below in the grazing management descriptions for each allotment.

Under Alternative 1, the biological planning process has been used for several years on the Empire-Cienega allotment to assist with determining appropriate stocking rates and adjusting pasture rotations in response to resource conditions and management concerns. Table 2-14 shows the total vegetation production in favorable, normal, and unfavorable years (based on rainfall) on all lands within the Empire-Cienega allotment. Also shown is the average amount of forage that livestock could consume on this allotment

**Map 2-21**

**Administrative Sites**

Four administrative sites are designated under Alternatives 2, 3, and 4.



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United States Department of the Interior  
BUREAU OF LAND MANAGEMENT  
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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Administrative Site



**Table 2-12**  
**Current Authorized Grazing Use, Las Cienegas Resource Management Plan**

Allotment	Total Acres	Total Acres Grazed	Total Cows	BLM Acres Grazed	Cows on BLM	BLM Acres not Grazed	ASLD Acres	ASLD Cows	Private Acres	Cows on	
					Cows (CYL <sup>1</sup> )					Aums	Private Cows
Empire	74,146	73,487	1,500	36,025	704	8,488	659	37,462	796	0	0
Empirita	24,988	23,908	337	440	9	108	1,080	23,468	328	0	0
Rose Tree	8,869	8,869	200	3,950	92	1,104	0	3,719	24	1,200	84
Vera Earl	1,440	1,440	27	1,440	27	324	0	0	0	N/A	N/A
Empire Mountains	3,524	0	0	0	0	0	2,480	0	0	1,044 (Not Grazed)	0
<b>TOTAL:</b>	<b>115,923</b>	<b>107,704</b>	<b>2,064</b>	<b>41,855</b>	<b>832</b>	<b>9984</b>	<b>4,219</b>	<b>64,649</b>	<b>1,148</b>	<b>2,244</b> (1,200 Grazed)	<b>0</b>

<sup>1</sup> CYL = Cattle year-long

under variable stocking rates. The available useable forage is assumed to be 50% of the total vegetation produced multiplied by the current 50% utilization rate on those lands allocated for livestock grazing. In contrast to the hypothetical example in Table 2-13, the percentage of available useable forage consumed remains fairly constant (between 41.5 and 45.5 %) under this management strategy.

**Highlights of Current Grazing Management**

- On the four allotments grazing management strategies continue to incorporate various rotational philosophies.
- Livestock grazing on the Empire-Cienega allotment continues to be managed under the interim grazing plan (BLM 1995), which Appendix 2 summarizes in more detail. Livestock grazing on the Empirita Allotment would continue to be managed under the current coordinated grazing management plan (NRCS 1994). No management plan or monitoring is in place on either the Rose Tree or Vera Earl allotments.

- Only one of the current operations (Empire-Cienega) has begun a biological planning process to help guide management and resolve conflicts in proposed management. All allotments implement the current utilization limit. This limit restricts average utilization to 40-60% of current year's growth on key perennial grass species. This limit also assures that the physiological requirements of plant growth, rest, and reproduction are met for the following key species:

- Perennial Grasses:  
 Plains Lovegrass (ERIN)  
 Sideoats Grama (BOCU)  
 Cane Beardgrass (BOBA3)  
 Vine Mesquite (PAOB)  
 Black Grama (BOER4)  
**Blue Grama (BOGR)**  
 Hairy Grama (BOH12)  
 Sprucetop Grama (BOCH)  
 Plains Bristlegrass (SELE2MA)  
 Woolly Bunchgrass (ELBA)  
 Green Sprangletop (LEDU)  
 Arizona Cottontop (DICA8)  
 Crinkleawn (TRSP12)  
 Bush Muhly (MUPO2)  
 Prairie Junegrass (KOCR)

Shrubs and Succulents:  
 False Mesquite (CAER)  
 Range Ratany (KRPA)  
 Shrubby Buckwheat (ERWR)  
 Palmer's Agave (AGPA)

**Empire-Cienega Allotment (#6090)**

BLM leases the federal lands in the Empire-Cienega allotment to John and Mac Donaldson for livestock grazing. This lease expires

December, 31 ~~2002~~ 2007 BLM also subleases the State of Arizona livestock grazing leases (05-1597 and 05-1623) to the Donaldsons.

Summary of RMP-Level Proposal

Continue to allocate 8,448 AUMs of forage on approximately 36,025 acres of the 36,684 acres of public land in the Empire-Cienega allotment for livestock grazing. Continue to exclude 659 acres from the regular livestock rotation.

**Table 2-13**  
**Vegetation Production and Livestock Forage Consumption Under Three Rainfall Regimes on Four Allotments, Assuming Livestock Held at Maximum Stocking Rates**  
**Las Cienegas Resource Management Plan**

	Total Acres Grazed	Total Cows	Total Production Grazed Acres <sup>1</sup> (Million-lbs.)	Production Consumed by Total Cows (Million-lbs.)	% Total Production Consumed	Available Useable <sup>2</sup> Forage (Million-lbs.)	% Available Useable Forage Consumed
Favorable <sup>3</sup> Year	107,704	2,064	179.52	19.81	11	44.88	44
Normal Year	107,704	2,064	119.68	19.81	16	29.92	66
Unfavorable Year	107,704	2,064	78.99	19.81	24	19.75	100

<sup>1</sup>Total vegetation production comes from the NRCS Ecological Site guides for "favorable, normal, and unfavorable" years and is provided in the site guides only for reference areas considered to have an excellent similarity correlation to the "Historic Climax Plant Community" for each ecological site. Production encompasses all forms of vegetation production, including trees and shrubs so cattle never use a certain amount of production. But production still provides a relative index of cover produced.

<sup>2</sup>Useable forage is that portion of the production (less 50% of production reserved for watershed and range health) that is accessible to livestock and that can be grazed without damage to the health of the plant and may be allocated for livestock use. Total Useable Forage = Total Production less 50% reserved for watershed and wildlife multiplied by the utilization limit of 50%. Note that livestock consumption remains constant although the amount of useable forage is dropping.

<sup>3</sup>The "favorable, normal, and unfavorable" years are mainly a reflection of rainfall. This variable is used to show that production varies greatly in response to the amount and timing of precipitation, and how different livestock stocking rates affect the amount of vegetation cover remaining to achieve the watershed and wildlife objectives in the plan. In a Favorable Year, the assumed average production is 1800 lbs/ac and 0.25 AUM/ac on the Empire, Rose Tree, and Vera Earl ranches on the basis of NRCS Ecological Site Guides, and 1200 lbs/ac and 0.18 AUM/ac on the Empirita and Empire Mountain grazing units. In a Normal Year, the assumed average production is 1200 lbs/ac and 0.15 AUM/ac on the Empire, Rose Tree, and Vera Earl allotments based on NRCS Ecological Site Guides, and 800 lbs/ac and 0.12 AUM/ac on the Empirita and Empire Mountain grazing units. In an Unfavorable Year, the assumed average production is 800 lbs/ac and 0.10 AUM/ac on the Empire, Rose Tree, and Vera Earl ranches on the basis of NRCS Ecological Site Guides, and 500 lbs/ac and 0.09 AUM/ac on the Empirita and Empire Mountain grazing units.

**Table 2-14**  
**Vegetation Production and Livestock Forage Consumption Under Three Rainfall Regimes**  
**(With Livestock Numbers Varied) on the Empire-Cienega Allotment**  
**Las Cienegas Resource Management Plan**

	Total Acres Grazed	Total Cows	Total Production Grazed Acres <sup>1</sup> (Million-lbs.)	Production Consumed by Total Cows (Million-lbs.)	% Total Production Consumed	Available Useable Forage (Million-lbs.)	% Available Useable Forage Consumed
Favorable Year <sup>2</sup>	73,487	1,436	132.3	13.8	10.4	33.1	41.7
Normal Year	73,487	1,037	88.2	10.0	11.3	22.1	45.3
Unfavorable Year	73,487	662	58.8	6.4	10.9	14.7	43.5

<sup>1</sup> Total vegetation production comes from the NRCS Ecological Site guides for “favorable, normal, and unfavorable” years and is provided in the site guides only for reference areas considered to have an excellent similarity correlation to the “Historic Climax Plant Community” for each ecological site. Production encompasses all forms of vegetation production, including trees and shrubs so cattle never use a certain amount of production. But production still provides a relative index of cover produced.

Note: With variable stocking, a large portion of the useable forage base is held in reserve for unexpected changes (e.g., wildfire, pronghorn or sparrow cover, etc.)

<sup>2</sup> The “favorable, normal, and unfavorable” years are mainly a reflection of rainfall. This variable is used to show that production varies greatly in response to the amount and timing of precipitation and how different livestock stocking rates affect the amount of vegetation cover remaining to achieve the watershed and wildlife objectives in the plan. In a Favorable Year, the assumed average production is 1800 lbs/ac and 0.25 AUM/ac on the Empire, Rose Tree, and Vera Earl ranches on the basis of NRCS Ecological Site Guides, and 1200 lbs/ac and 0.18 AUM/ac on the Empirita and Empire Mountain grazing units. In a Normal Year, the assumed average production is 1200 lbs/ac and 0.15 AUM/ac on the Empire, Rose Tree, and Vera Earl allotments based on NRCS Ecological Site Guides, and 800 lbs/ac and 0.12 AUM/ac on the Empirita and Empire Mountain grazing units. In an Unfavorable Year, the assumed average production is 800 lbs/ac and 0.10 AUM/ac on the Empire, Rose Tree, and Vera Earl ranches on the basis of NRCS Ecological Site Guides, and 500 lbs/ac and 0.09 AUM/ac on the Empirita and Empire Mountain grazing units.

Summary of Current Empire-Cienega Grazing Management (See Appendix 2)

1. **Continue** current management **which** is a variable stocking rate with flexible livestock rotation-selective rest-rotation strategy (currently done voluntarily).
2. **Continue** the current authorized stocking rate **which** is 1,500 animal units on a year-long basis. But the lessee has chosen not to stock at the full capacity and has adjusted stocking rates whenever the resource showed the need. The average number of cattle run on the allotment since 1993 has been 1,037 cattle year-long (CYL) with a high of 1,436 and a low of 662.

3. **Continue the biological planning process.** To address management concerns, the lessees have developed and are using a biological planning process to assess and adjust proposed rotations. The composition and function of the current grazing plan and the biological planning process on the Empire-Cienega allotment are described in more detail in the Interim Grazing Management Plan for the Empire-Cienega Allotment (See Appendix 2). The input from the Biological Planning Team helps **rapidly more frequently** adjust grazing in response to the health of the resource and the availability of forage.

*Livestock Management Actions - Alternative 1*

- . BLM and the Arizona State Land Department **continue to** adjust stocking rates in response to established carrying capacities, results of vegetation monitoring studies, and applications for voluntary non-use.
- . BLM completed an ecological site inventory for the Empire-Cienega allotment in 1995.
- . **Continue to manage livestock grazing under the Empire-Cienega interim grazing plan.** BLM prepared an interim livestock grazing management plan for the Empire-Cienega allotment in 1995 (BLM 1995) to guide the management of livestock grazing in the Empire-Cienega Resource Conservation Area pending this amendment to the Phoenix Resource Management Plan. The interim plan (Appendix 2) did or does the following:
  - . Prescribes how the livestock grazing operation will be run to sustain the resources.
  - . Established permanent vegetation monitoring sites.
  - . Determines what range improvements are needed.
- 7. Under the interim plan, BLM will **continue to** authorize grazing use in the riparian pastures and enclosures only at watering points or crossing lanes or in limited circumstances to achieve a resource objective, such as fuels reduction.
- . BLM completed a biological evaluation of the interim grazing plan, consulted with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act, and received a biological opinion from the Service (No. 2-21-95-F-177). BLM is ~~now~~

**will continue** implementing the actions in the biological opinion (Appendix 2).

- . **Continue the current utilization limit.** The current utilization limit restricts average utilization to 40-60% of the current year's growth on key perennial grass species as described for Alternative 1 summary.

- . **Continue to develop the range improvements proposed in the Empire-Cienega interim grazing plan.** Existing and proposed range improvements under the current interim grazing plan for the Empire-Cienega allotment are shown on Map 2-22 **and in Tables 2-14A, 2-14B, and 2-14C.**

Table 2-15 compares the current grazing management strategy for the Empire-Cienega Allotment to the alternative allotment management strategies.

**Empirita Allotment (#6210)**

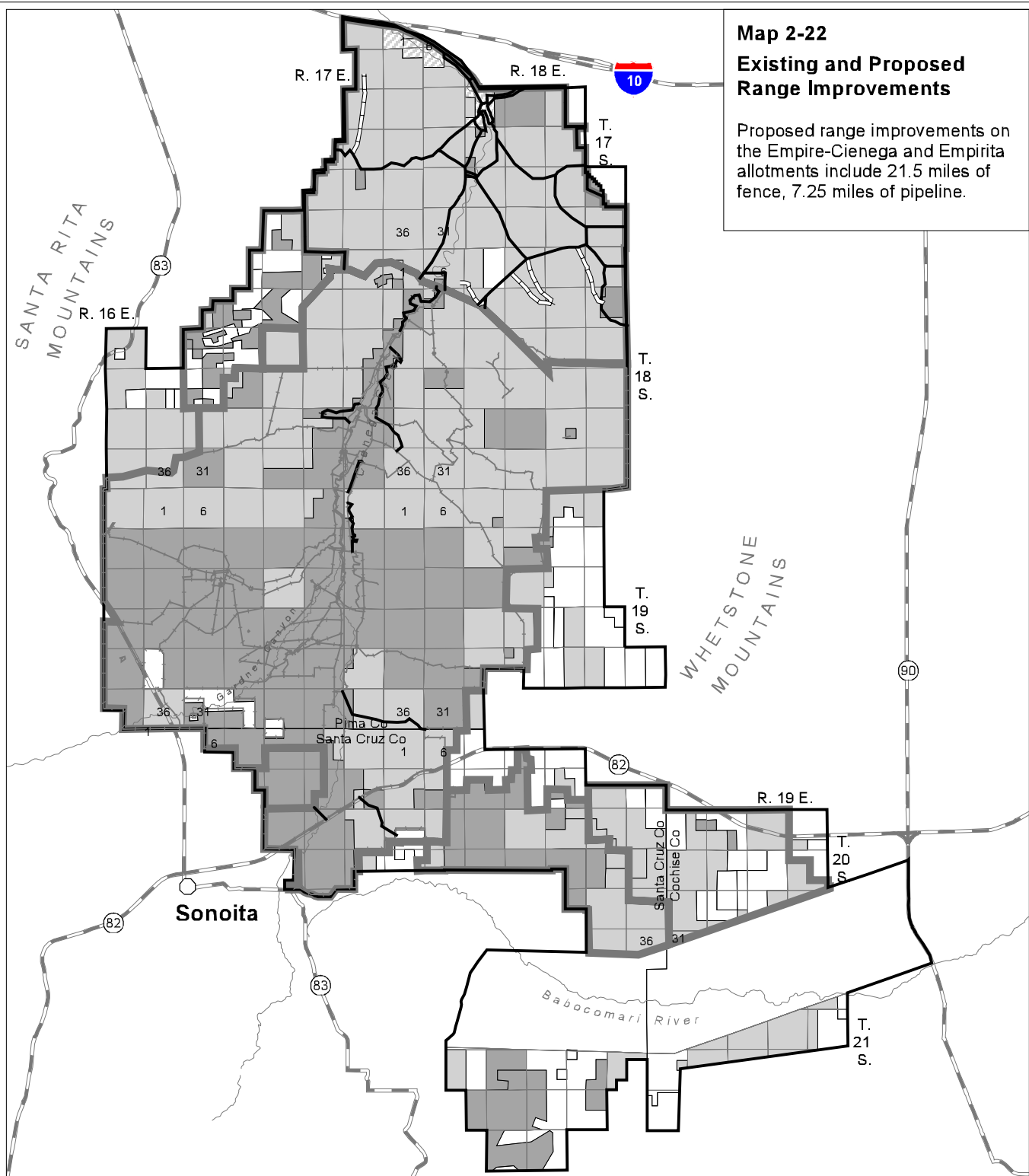
BLM leases a portion of the federal lands (440 acres) in the Empirita allotment to the Parsons Company for livestock grazing. BLM also subleases the State of Arizona livestock grazing lease (05-437) to the Parsons Company. In addition, 1,080 acres of federal lands, 550 acres of Pima County lands, and 320 acres of private lands within the allotment are neither owned or leased by the Parsons Company.

Summary of RMP-Level Proposal

Continue to allocate **108 AUMS of forage on approximately** 440 acres of the 1,520 acres of public land in the Empirita allotment for livestock grazing. The remaining 1,080 acres are not allocated for forage, but are not physically excluded from livestock grazing by fencing.

**Map 2-22**  
**Existing and Proposed**  
**Range Improvements**

Proposed range improvements on the Empire-Cienega and Empirita allotments include 21.5 miles of fence, 7.25 miles of pipeline.



**FINAL**  
**LAS CIENEGAS**  
**RESOURCE MANAGEMENT PLAN**



United States Department of the Interior  
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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Grazing Allotment Boundary
- Pipeline, Existing
- Fence, Existing
- Pipeline, Proposed
- Fence, Proposed

April 2002

**Table 2-14A**  
**Riparian Crossing Lanes on Cienega Creek Under Current Management (Alternative 1)**  
**Empire-Cienega Interim Grazing Plan**

<b>Lane</b>	<b>Pasture</b>	<b>TWP</b>	<b>RNG</b>	<b>Section</b>
New Road Crossing	North/Mac's Sacaton	18 S	17 E	34
New Jesse Lane	North/Lower 49/ Mac's Sacaton	18 S	17 E	26
New Fresno Gap Lane	Lower 49/ Rockhouse/Lower Mattie Sacaton	18 S	17	23
New Dominguez Lane	Rockhouse/Fresno	18 S	17	13
Narrows Lane	Rockhouse/Apache	18 S	18	7
Lower 49 Gaps (Existing)	Lower 49/Mac's Sacaton	18 S	17 E	2

**Table 2-14B**  
**Summary of Proposed Fencing, Empire-Cienega Interim Grazing Plan**

<b>Project Name</b>	<b>Pasture</b>	<b>Township</b>	<b>Range</b>	<b>Section</b>
Spring Water Sacaton Fence	E 500 Acre & 5 Wire & Mac's	19 S	17 E	2, 11
		18 S	17 E	34, 35
Lower 49 Sacaton Fence	Lower 49/500 Acre & 5 Wire	18 S	17 E	26 NW, 27 NE
Lower Mattie Sacaton Fence	L. Mattie/Fresno	18 S	17 E	13, 23, 24, 25, 26
Rockhouse Riparian Fence	Rockhouse/Apache	18 S	18 E	6, 7.
		18 S	17 E	12, 13
Narrows Riparian Fence	Empirita	18 S	18 E	6

**Table 2-14C**  
**Empire-Cienega Ranch Water Developments, Empire-Cienega Interim Grazing Plan**

<b>Project Name</b>	<b>Township</b>	<b>Range</b>	<b>Section</b>	<b>Units</b>
Lower 49 Well Drill Equipment, Tank, and Fence	18 S	17 E	27, 23, 26, 27	1 Well and Tank 1.5 mi. Fence
Enzenburg North Well and/or Sam's Well Project	18 S	17 E	34 NW	1
Mud Springs Well Drill, Equipment, and Tank	19 S	18 E	29 NE	1 Each
Upper 49 Well Redrill, Equipment and Tank, or Reservoir Construction	18 S	17 E	26 NW	1 Each
Upper Road Canyon Well Drill, Equipment, Tank and Fence	19 S	17 E	16 NE 26, 27, 35, 36	1 Well 2 Tanks 3 mi. Fence
Upper Apache Div. Fence	18 S	18 E	22, 27, 34	3 mi. Fence
Test Hole Wing Fence	18 S	18 E	28, 33	1 mi. Fence
Hilton Pasture Fence	Not Determined			
Road Canyon Div. Fence	Not Determined			

Summary of the Current Empirita Grazing Management

1. **Continue the current grazing strategy.** The current grazing strategy is a deferred rotation grazing system with set stocking rates.
2. **Continue to develop proposed range improvements in current grazing plan.** The Parsons are working with BLM, the Natural Resources Conservation Service (NRCS), and the Arizona State Land Department (ASLD) to develop range improvements to implement the grazing strategy.
3. **Continue current authorized use.** The current authorized use is 337 CYLs at 3% public land use = 121 AUMs. The Parsons Company has been taking partial non-use since it leased the allotment, while range improvements are being built to implement proper grazing management.
4. The grazing lessee **will continue to** work with the NRCS, BLM, and the ASLD to determine pasture rotation and yearly adjustments in livestock numbers. No biological planning process is in place.
5. BLM and ASLD **will continue to** determine adjustments in the established stocking rates in response to vegetation monitoring studies and voluntary non-use.
6. BLM and NRCS completed an ecological site inventory of the rangelands on the Empirita allotment in 1994.
7. **Continue to manage livestock grazing according to the existing Empirita grazing management plan.** The Parsons Company Inc., NRCS, ASLD, and BLM cooperatively developed a grazing management plan for the Empirita allotment in 1994. The plan: (1) prescribed how the livestock grazing operation would be run to sustain the resources, (2) established permanent

vegetation monitoring sites, and (3) determined needed range improvements. No study enclosures **are proposed** exist.

- . **Continue** current grazing management **which** restricts average utilization to 40-60% of the current year's growth on key perennial grasses, as described in the Alternative 1 summary.
- . **Continue to develop range improvements proposed in the grazing plan.** Existing and proposed range improvements under the current Empirita grazing plan are shown on Map 2-22.

Table 2-16 compares the current grazing management strategy for the Empirita allotment to the alternative allotment management strategies.

#### **Rose Tree Allotment (#6043)**

BLM leases the federal lands (3,950 acres) in the Rose Tree allotment to Rose Tree LLC for livestock grazing.

##### Summary of RMP-Level Proposal

Continue to allocate **1,104 AUMs of forage on about** 3,950 acres of public land in the Rose Tree allotment for livestock grazing.

##### Summary of Current Rose Tree Grazing Management

- . **Continue** the current grazing strategy **which** is a deferred rotation grazing system with set stocking rates.
- . **Continue** the current stocking rate (authorized use) **which** is 200 CYL at 46% public land use = 11,104 AUMs.

#### *Livestock Management Actions - Alternative 1*

- . The lessee **will continue to** decide on pasture rotation and yearly adjustments in livestock numbers. No biological planning process is in place.
- . BLM and ASLD **would continue to** determine adjustments in established stocking rates from vegetation monitoring studies and voluntary non-use. These public lands are not currently being monitored. An ecological site inventory of the rangelands has not been completed.
- . A grazing management plan has not been completed.
- . No study enclosures exist.
- . **Continue** current grazing management **which** restricts average utilization to 40-60% of current year's growth on key perennial grass species, as described in the Alternative 1 summary.

Table 2-17 compares the current grazing management strategy for the Rose Tree Allotment to the alternative allotment management strategies.

#### **Vera Earl Allotment (#6129)**

BLM leases the federal lands (1,440 acres) in the Vera Earl allotment to the estate of Bettie A. Beck for livestock grazing.

##### Summary of RMP-Level Proposal

Continue to allocate all **324 AUMs of forage on about** 1,440 acres of public land in the Vera Earl allotment for livestock grazing.

##### Summary of Current Vera Earl Grazing Management

- . **Continue** the current grazing strategy **which** is a deferred rotation grazing system with set stocking rates.



**Table 2-15. Current and Proposed Livestock Grazing Management on the Empire-Cienega Allotment**

	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Forage (RMP Allocation)</b>	8,448 AUMs of forage allocated or 709 cows year long (CYL) on public lands	8,448 AUMs of forage allocated or 709 cows year long (CYL) on public lands	4,680 AUMs of forage allocated or 390 cows year long (CYL) on public lands	No forage allocated on public lands
<b>Acres (RMP Allocation)</b>	Public land acres: 36,684 Grazed acres <sup>1</sup> : 36,025 Acres in exclosures: 659 <sup>2</sup>	Public land acres: 36,684 Grazed acres: 34,365 Acres in exclosures: 2,319	Public land acres: 36,684 Grazed acres: 36,025 Acres in exclosures: 659	All 36,684 public land acres excluded from livestock grazing
<b>Livestock Numbers</b>	1500 cattle year-long (CYL) on allotment (49% BLM) = 709 CYL on public lands	Up to 1500 CYL on allotment (49% BLM) = 709 CYL on public lands with numbers set annually in response to resource monitoring and evaluation through biological planning <sup>3</sup>	796 CYL on allotment (49% BLM) <sup>4</sup> = 390 CYL on public lands	0 on BLM lands; 796 CYL on State Trust lands within allotment <sup>5</sup>
<b>Stocking Rate</b>	Variable stocking rate (average in past years has been 1,037 CYLs, range of 662-1436)	Variable stocking rate	Fixed stocking rate	Set stocking rate on State Trust Lands
<b>Pasture Rotation</b>	Flexible livestock rotation (selective rest rotation)	Flexible livestock rotation	Scheduled deferred/rest rotation on a seasonal basis	Unknown
<b>Monitoring Process</b>	Decisions based on review of Biological Planning Team recommendations by BLM field manager	Decisions based on monitoring of resource conditions and objectives and review of Biological Planning Team recommendations by BLM field manager	Decisions based on livestock numbers, set rotations, and BLM/ASLD/NRCS monitoring. No Biological Planning Team	Decisions by Arizona State Land Department (ASLD)
<b>Proposed Improvements</b>	Build and maintain 12 range improvement projects to include: <ul style="list-style-type: none"> <li>• 20.5 miles fence</li> <li>• 3 new wells with 3 tanks</li> <li>• 3 redeveloped wells (Map 2-22)</li> </ul>	Same as Alternative 1 with more study exclosures	Same as Alternative 1 without more exclosures	Build 85 miles of fence to exclude cattle from BLM lands

ASLD = Arizona State Land Department; NRCS = Natural Resources Conservation Service

<sup>1</sup> The numbers of acres available for grazing will vary over time with the numbers of acres in exclosures.

<sup>2</sup> The exact number of excluded acres may vary depending on the number, size, and location of study exclosures which will be developed to help evaluate the effectiveness of grazing management.

<sup>3</sup> The actual number of livestock would vary annually due to the flexible stocking in association with the Biological Planning Process described in the Livestock Management Actions for Alternative 2.

<sup>4</sup> BLM does not manage the State lease. Although we suggest stocking under this alternative to be 409 CYL, it would remain at 796 CYL on State Lease.

<sup>5</sup> It is unknown whether the State Lease would continue to be grazed under Alternative 4.

**Table 2-16. Current and Proposed Livestock Grazing Management for the Empirita Allotment**

	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Forage (RMP Allocation)</b>	108 AUMs of forage allocated for 9 cows year long (CYL) on public lands	288 AUMs of forage allocated for 24 cows year long (CYL) on public lands	168 AUMs of forage allocated for 14 cows year long (CYL) on public lands	No forage allocated on public lands
<b>Acres<sup>1,2</sup> (RMP Allocation)</b>	Public land acres: 1,520 Grazed acres: 440 Acres in enclosures: 0 Acres w/out forage allocated: 1,080	Public land acres: 1,520 Grazed acres: 1,000 Acres in enclosures: 520	Public land acres: 1,520 Grazed acres: 1,480 Acres in enclosures: 40	Livestock excluded from all of 1,520 public land acres
<b>Livestock Numbers</b>	337 CYL on allotment (2% BLM) = 9 CYL on public lands	Up to 24 CYL <sup>3</sup> on public lands with numbers set annually in response to resource monitoring and evaluation through biological planning	229 CYL on allotment (5% BLM) <sup>4</sup> = 14 CYL on public lands	0 on BLM Lands; 328 CYL <sup>5</sup> on State Trust Lands in allotment
<b>Stocking Rate</b>	Set stocking rate, but have been running less (See Narrative)	Variable stocking rate	Set stocking rate	Set stocking rate on State Trust Land
<b>Pasture Rotation</b>	Deferred rotation (partially implemented)	Flexible livestock rotation	Deferred rotation	Unknown rotation
<b>Monitoring Process</b>	Decisions based on set livestock numbers, set rotations, and ASLD/NRCS/BLM monitoring	Decisions based on resource conditions/objectives monitoring and review of Biological Planning Team	Decisions based on set livestock numbers, set rotations, and ASLD/NRCS/BLM monitoring	Decisions by Arizona State Land Department (ASLD)
<b>Proposed Improvements</b>	Build and maintain 7 range improvement projects to include: <ul style="list-style-type: none"> <li>• 1 mile fence</li> <li>• 7.25 miles pipeline (1 new and 6.25 rebuilt)</li> <li>• 1 new well with storage</li> <li>• new storage/trough at old well</li> <li>• 2 corrals (Map 2-22)</li> </ul>	Same as Alternative 1 with riparian enclosure at Narrows and at Nogales Spring (Map 2-22)	Same as Alternative 2	None

<sup>1</sup> The numbers of acres available for grazing will vary over time with the numbers of acres in enclosures

<sup>2</sup> The exact number of excluded acres may vary depending on the number, size, and location of study enclosures which will be developed to help evaluate the effectiveness of grazing management.

<sup>3</sup> The actual number of livestock would vary annually due to the flexible stocking in association with the Biological Planning Process described in the Livestock Management Actions for Alternative 2

<sup>4</sup> BLM does not manage the State lease. Although we suggest stocking under this alternative to be 215 CYL, it would remain at 328 CYL on State Lease.

<sup>5</sup> It is unknown whether the State Lease would continue to be grazed under Alternative 4.

**Table 2-17. Current and Proposed Livestock Grazing Management for the Rose Tree Allotment**

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<b>Forage (RMP Allocation)</b>	1,104 AUMs of forage allocated for 92 cows year long (CYL) on public lands	1,104 AUMs of forage allocated for 92 cows year long (CYL) on public lands	516 AUMs of forage allocated for 43 CYL on public lands	No forage for livestock allocated on public lands
<b>Acres<sup>1,2</sup> (RMP Allocation)</b>	Public land acres: 3,950 Grazed acres: 3,950 Acres in exclosures: 0	Public land acres: 3,950 Grazed acres: 3,550 Acres in exclosures: 400	Public land acres: 3,950 Grazed acres: 3,950 Acres in exclosures: 0	All 3,950 public land acres excluded from livestock
<b>Livestock Numbers</b>	200 CYL on allotment (45% BLM) = 92 CYL on public lands	Up to 92 CYL <sup>3</sup> with numbers set annually from resource monitoring and evaluation through biological planning	96 CYL <sup>4</sup> on allotment (45% BLM) = 43 CYL on public lands	None on BLM lands on allotment; 108 CYL on State Trust and private lands <sup>5</sup>
<b>Stocking Rate</b>	Set stocking rate	Variable set stocking rate	Set stocking rate	Set stocking rate
<b>Pasture Rotation</b>	Deferred rotation	Flexible stocking rate	Deferred rotation	Unknown rotation
<b>Monitoring Process</b>	Decisions based on set livestock numbers, set rotations, and ASLD/BLM monitoring	Decisions based on resource conditions/objectives monitoring and Biological Planning Team review	Decisions based on set livestock numbers, set rotations, and ASLD/BLM monitoring	Decision by Arizona State Land Department (ASLD)
<b>Proposed Improvements</b>	None currently proposed	<ul style="list-style-type: none"> <li>Complete ecological site inventory</li> <li>Evaluate allotment, including need for grazing plan, range improvements, or both</li> </ul>	Same as for Alternative 2	Build 12 miles of fence to exclude cattle from BLM lands

ASLD=Arizona State Land Department.

<sup>1</sup> The numbers of acres available for grazing will vary over time with the numbers of acres in exclosures.

<sup>2</sup> The exact number of excluded acres may vary depending on the number, size, and location of study exclosures which will be developed to help evaluate the effectiveness of grazing management.

<sup>3</sup> The actual number of livestock would vary annually due to the flexible stocking in association with the Biological Planning Process described in the Livestock Management Actions for Alternative 2.

<sup>4</sup> BLM does not manage the State lease. Although we suggest stocking under this alternative to be 53 CYL, it would remain at 108 CYL on State Lease.

<sup>5</sup> It is unknown whether the State Lease would continue to be grazed under Alternative 4.

2. **Continue** the current stocking rate **which** is 27 CYL on the BLM portion of the allotment (100% public land use). On the entire allotment, the authorized use is about 282 CYL at 10% public land use = 338 AUMs (rounded to facilitate an even number of cattle for a year-long operation). The grazing lessee, in coordination with the Forest Service, decides on pasture rotation and yearly adjustments in livestock number and voluntary non-use. No biological planning process is in place.
- . The Forest Service, BLM, and the operator **will continue to** determine adjustments in stocking rates from vegetation monitoring studies. The public lands in the allotment are not presently being monitored.
- . An ecological site inventory of the rangelands has not been completed.
- . A grazing management plan has not been completed.
- . No study enclosures exist.
- . **Continue** current grazing management **which** restricts average utilization to 40-60% of the current year's growth on key perennial grass species, as described in the Alternative 1 summary.

Table 2-18 compares the current grazing management strategy for the Vera Earl Allotment to the alternative allotment management strategies.

### **Empire Mountains**

Under Alternative 1 (Current Management), no grazing allotment has been established in the Empire Mountains although several applications have been filed with BLM requesting the establishment of a new allotment. Table 2-19 compares the grazing management strategies for the Empire Mountains under the four alternatives.

### **Alternative 2--Activity Plan Management Actions (Agency Preferred)**

The **Activity Plan Management Actions** for Alternative 2 can be divided into two main sections. The first section includes management actions that are considered essential to achieving the resource objectives for the Empire-Cienega Planning Area and, therefore, are actions common to ~~the activity plans for~~ all three action alternatives (Alternatives 2, 3, and 4). The second section includes livestock grazing and recreation management actions that differ among the alternatives.

### **Management Actions Common to Alternatives 2, 3, and 4**

#### ***Watershed: Upland, Riparian, and Aquatic Area Management Actions***

The following actions are proposed in support of the upland vegetation, riparian vegetation, **and** aquatic ~~and fish and wildlife~~ objectives:



**Table 2-18  
Current and Proposed Livestock Grazing Management for the Vera-Earl Allotment**

		<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 1</b>
<b>Forage (RMP Allocation)</b>	324 AUMs of forage allocated for 27 cows year long (CYL) on public lands	324 AUMs of forage allocated for 27 cows year long (CYL) on public lands	192 AUMs of forage allocated for 16 cows year long (CYL) on public lands	No forage for livestock allocated on public lands
<b>Acres<sup>1,2</sup> (RMP Allocation)</b>	Public land acres: 1,440 Grazed acres: 1,440 Acres in enclosures: 0	Public land acres: 1,440 Grazed acres: 1,240 Acres in enclosures: 200	Public land acres: 1,440 Grazed acres: 1,440 Acres in enclosures: 0	All of 1,440 public land acres excluded from livestock grazing
<b>Livestock Numbers</b>	27 CYL at 100% BLM	Up to 27 CYL <sup>3</sup> on public lands with numbers set annually in response to resource monitoring and evaluation through biological planning	16 CYL at 100% BLM	0 on BLM Lands; 255 CYL on private, State Trust, and USFS lands
<b>Stocking Rate</b>	Set stocking rate	Variable stocking rate	Set stocking rate	Set stocking rate
<b>Pasture Rotation</b>	Deferred rotation	Flexible livestock rotation	Seasonal use (rotating the season)	Unknown rotation
<b>Monitoring Process</b>	Decisions based on set livestock numbers, set rotations, and BLM monitoring	Decisions based on resource conditions and objectives monitoring and Biological Planning Team review	Decisions based on set livestock numbers, set rotations, and BLM monitoring	Decisions by Arizona State Land Department
<b>Proposed Improvements</b>	None currently proposed	<ul style="list-style-type: none"> <li>Complete ecological site inventory</li> <li>Evaluate allotment, including need for grazing plan, range improvements, or both</li> </ul>	Same as Alternative 2	Build two miles of fence to exclude cattle from BLM lands

ASLD = Arizona State Land Department; USFS = U.S. Department of Agriculture Forest Service

<sup>1</sup> The numbers of acres available for grazing will vary over time with the numbers of acres in enclosures.

<sup>2</sup> The exact number of excluded acres may vary depending on the number, size, and location of study enclosures which will be developed to help evaluate the effectiveness of grazing management.

<sup>3</sup> The actual number of livestock would vary annually due to the flexible stocking in association with the Biological Planning Process described in the Livestock Activity Plan Management Actions for Alternative 2.

**Table 2-19  
Current and Proposed Livestock Grazing Management for the Empire Mountains**

	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>Forage (RMP Allocation)</b>	None	360 AUMs allocated for 30 cows year long (CYL) on public lands	324 AUMs allocated for 27 cows year long (CYL) on public lands	None
<b>Acres<sup>1,2</sup> (RMP Allocation)</b>	No allotment established on 2,480 public land acres in Empire Mountains	Public land acres: 2,480 Grazed acres: 2,000 Acres in enclosures: 480	Public land acres: 2,480 Grazed acres: 2,480 Acres in enclosures: 0	No allotment established on 2,480 public land acres in Empire Mountains
<b>Livestock Numbers</b>	N/A	Up to 30 CYL <sup>3</sup> on public lands with numbers set initially and then annually in response to resource monitoring and evaluation through biological planning	38 CYLs at 70% BLM on allotment and 27 CYL on public lands	N/A
<b>Stocking Rate</b>		Variable stocking rate	Set stocking rate	
<b>Pasture Rotation</b>		Flexible livestock rotation	Deferred rotation	
<b>Monitoring Process</b>		Decisions based on resource conditions/objectives monitoring and review of Biological Planning Team	Decisions based on set livestock numbers, set rotations, and BLM monitoring	
<b>Proposed Improvements</b>		<ul style="list-style-type: none"> <li>Complete ecological site inventory</li> <li>Develop grazing plan to meet objectives and develop needed range improvements before authorizing any use.</li> </ul>	Same as Alternative 2	

<sup>1</sup> The numbers of acres available for grazing will vary over time with the numbers of acres in enclosures.

<sup>2</sup> The exact number of excluded acres may vary depending on the number, size, and location of study enclosures which will be developed to help evaluate the effectiveness of grazing management.

<sup>3</sup> The actual number of livestock would vary annually due to the flexible stocking in association with the Biological Planning Process described in the Livestock Activity Plan Management Actions for Alternative 2.

## Chapter 2: Part B - Management Actions

### 1. Implement an integrated vegetation treatment program.

The resource goals and objectives in this plan require maintaining desired plant communities, where they are occurring, and attaining desired vegetation states, where existing conditions are not satisfactory. BLM will apply integrated vegetation treatment to meet vegetation objectives by directing desired changes in vegetation communities selected by the plan's monitoring and evaluation protocol. This proposed vegetation treatment program will respond to the many plant-control requirements for achieving resource objectives. With the proposed changes to livestock grazing, recreation, and other land uses, the vegetation treatments are designed to meet the resource objectives.

The proposed treatment program would allow the use of prescribed burning and chemical applications (mainly herbicides), as well as provide for the use of manual, mechanical, and biological treatments. The integrated vegetation management approach consists of selecting and integrating treatment methods for predicted ecological, sociological, and economic effects. BLM will select vegetation treatment methods for a particular project in response to site-specific analyses, which will consider several important parameters including the following:

- Characteristics of the target plant species.
- Associated non-target plant species.
- Uses of the target area.
- Physical characteristics of the area to be treated.
- Climatic conditions at the time of treatment.

- Proximity to sensitive areas.
- Need for pretreatment of areas or later re-vegetation.
- Determining environmental effects.
- Feasible alternatives.

**In non-wildland urban interface areas, BLM will implement the integrated vegetation treatment strategy in coordination with surrounding land owners including the Coronado National Forest (which has an upcoming planning process), Arizona State Land Department, and private land owners. The strategy will include the cooperative planning and implementation of prescribed fire on lands within and adjacent to the planning area when it is practical from ecological and administrative standpoints. This collaboration may result in an enlarged potential prescribed fire treatment area in the eastern portion of the planning area, beyond the 20,000 acres initially proposed.** (Appendix 2 describes the vegetation treatment methods in more detail.)

The following are the general vegetation treatment prescriptions for each allotment:

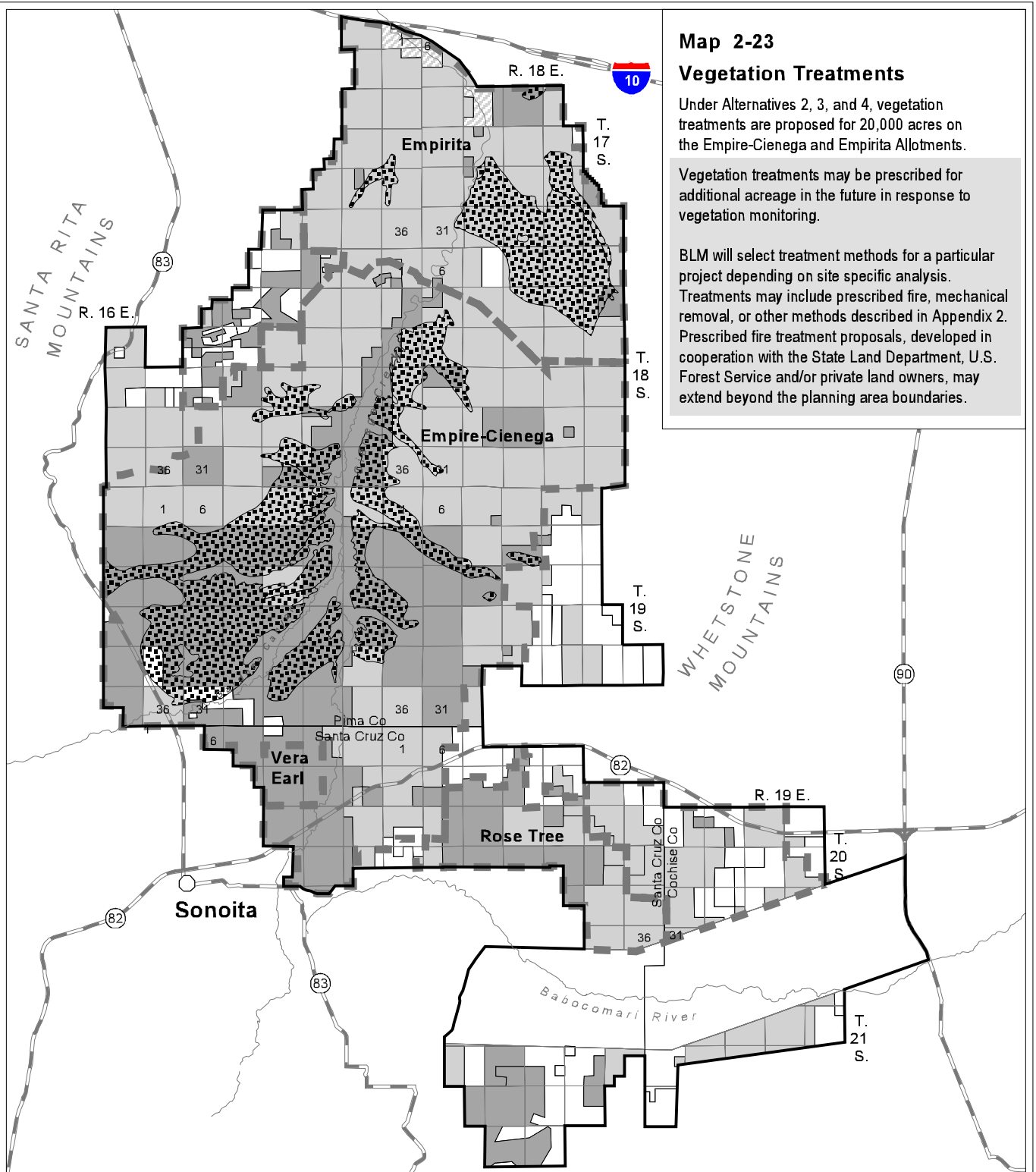
- **Empire-Cienega--**Treat **up to** 11,582 acres of Sandy Loam Upland and Loamy Upland ecological sites, **where desired ecological condition has not been achieved.** Methods would include **a combination of prescribed fire,** combined mesquite cutting, applying herbicide to cut stumps, burning slash and shrubby vegetation, and deferring grazing (Map 2-23). Vegetation treatments may be prescribed for additional acreage in the future in response to vegetation monitoring.
- **Empirita--**Treat **up to** 8,324 acres of Limy Slopes and Limy Upland ecological sites. Methods would include prescribed burning and deferred grazing (Map 2-23). Vegetation treatments may be prescribed

## Map 2-23 Vegetation Treatments

Under Alternatives 2, 3, and 4, vegetation treatments are proposed for 20,000 acres on the Empire-Cienega and Empirita Allotments.

Vegetation treatments may be prescribed for additional acreage in the future in response to vegetation monitoring.

BLM will select treatment methods for a particular project depending on site specific analysis. Treatments may include prescribed fire, mechanical removal, or other methods described in Appendix 2. Prescribed fire treatment proposals, developed in cooperation with the State Land Department, U.S. Forest Service and/or private land owners, may extend beyond the planning area boundaries.



## FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN



United States Department of the Interior  
BUREAU OF LAND MANAGEMENT  
TUCSON FIELD OFFICE



### LEGEND

- Planning Area Boundary
- Grazing Allotment Boundary
- Private Land
- State Land
- BLM Land
- Vegetation Treatment Area



## Chapter 2: Part B - Management Actions

for additional acreage in the future in response to vegetation monitoring

- **Rose Tree**--Conduct ecological site inventory to determine the vegetation condition compared to the site potential and the upland vegetation objective. Evaluate the need for any vegetation treatments and develop proposed projects as suitable.
  - **Vera Earl**--~~None proposed.~~ **Conduct ecological site inventory to determine the vegetation condition compared to the site potential and the upland vegetation objective. Evaluate the need for any vegetation treatments and develop proposed projects as suitable.**
  - **Empire Mountains**--Conduct an ecological site inventory to determine the vegetation condition compared to the site potential and the upland vegetation objective. Evaluate the need for any vegetation treatments and develop proposed projects as suitable.
2. Designate the public lands within the Empire-Cienega Planning Area as a noxious/invasive weed management area (See Appendix 2 for more information).
- BLM will not introduce or authorize the introduction of exotic species, unless doing so is essential to control noxious weeds or other undesirable species. BLM will continue to consider potential noxious weed and invasive species impacts in environmental assessments prior to authorization of projects on public lands in the planning area. BLM will continue to consider authorization of control activities for exotic species or noxious weeds on a case-by-case basis in accordance with provisions of the Act.**
3. Remove or control non-native vegetation species where monitoring finds that they threaten native species and where control is feasible and will not degrade ecosystem function over the long-term.

4. ~~Require permits for collecting and harvesting plant materials in any amount for commercial or noncommercial use. Assess on a case-by-case basis proposals for collecting and harvesting plants. Plant collections must contribute to or not conflict with maintaining or meeting the planning area's resource objectives. Implement a Vegetative Products Management program with the following guidelines:~~
- a. Collection of flowers, leaves, and fruit (including nuts, berries, and seeds) from plants on BLM managed public lands would be allowed for personal use in accordance with state native plant laws. The quantity of material collected would be limited to a maximum of up to 20 pounds (depending on the type of material) per person per year.**If monitoring determines that levels of use have become an issue, a free use permit system would be initiated and permits would be issued up to the amount of vegetative material available under sustained yield.**
  - b. **Collection of dead and down and detached wood for on-site campfire use would be allowed.**
  - c. **Reasonable amounts of wood may also be used for administrative purposes.**
  - d. **Collection of entire live plants or cholla skeletons, yucca or agave stalks, and ocotillo would not be permitted except for in salvage or treatment areas as described below.**
  - e. **Harvest of entire live plants or skeletons of plants (including yucca or agave stalks, cholla skeletons, dead or dormant ocotillo stems) for personal or commercial use would be limited to permitted salvage operations, where vegetation is destined to be destroyed by surface disturbance, or to vegetation treatment areas, where removal of specific vegetation will help**

achieve the objectives of the treatment. Salvage operations are anticipated to be only in small project areas, whereas vegetation treatments may cover larger areas.

- f. Negotiated sales of vegetative products (excluding entire live plants, yucca or agave stalks, cholla skeletons, and dead or dormant ocotillo stems) for commercial use would be considered in the future. Proposed sales would be subject to compliance with the National Environmental Policy Act and only if it complies with the NCA legislation and the objectives of this plan. Criteria used to determine suitability of any proposed sales would include the following:
- lack of significant impacts to soils, cultural resources, threatened and endangered species, riparian areas and other sensitive resources.
  - Consistency with management objectives of the NCA plan.
  - Ability to harvest product on a sustained yield basis.
  - Conformance with visual resource management policy.
  - Accessibility from designated roads and trails.
  - Whether harvest would promote invasive species.
  - Level of public demand and relative availability of product in region.
  - Ability to mitigate any surface disturbance.
- g. Collection of live vegetation or vegetative products will be allowed for legitimate scientific uses when covered by an

approved research permit and subject to compliance with the National Environmental Policy Act.

5. Work with other entities within the watershed to maintain or improve watershed processes and characteristics that affect infiltration, runoff, and sediment transport. Current sub-watersheds of concern include: Gardner Canyon, Springwater Canyon, **Mattie Canyon**, Fresno Canyon, and Apache Canyon.
6. Implement the existing watershed activity plan developed for Wood Canyon to stabilize erosion and restore the natural function of the drainage. The activity plan sets forth the following management prescriptions:
  - a. Monitor the rate at which the gully system in lower Wood Canyon is advancing and the mechanism involved in this erosion process.
  - b. Once the cause of erosion has been determined, develop methods for stabilization.
  - c. Implement methods of erosion prevention in lower Wood Canyon and other areas where this type of erosion is advancing.
7. Continue ecological restoration of old agricultural fields along Cienega Creek including, where feasible, routing drainages across diversion canal, restoration of wetland at south end, and restoration of sacaton/mesquite plant community.
8. Repair eroding streambanks or terraces at abandoned stream crossings or other disturbed sites along Cienega Creek and its tributaries where erosion from these banks or terraces is harming riparian or aquatic habitats or function.

## Chapter 2: Part B - Management Actions

**9. Inventory lentic (ponded) wetlands in the Cienega Creek floodplain including Cinco ponds and complete lentic PFC evaluation (See Appendix 2). Any wetlands determined to be ‘non-functional’ will be managed to meet the definition of proper functioning condition and advanced seral state of the plant community (See Desired Future Conditions section at the beginning of this chapter). Methods used to achieve functional condition may include periodic burning, livestock exclusion, or changes in season and/or duration of use in the appropriate combination.**

- . Limit motorized vehicles to designated roads and crossings on public lands (See Table 2-19A and Maps 2-6, 2-13, and 2-18).
- 11. Limit crossings of Cienega Creek for permitted group activities to dry crossings or designated road or trail crossings. Designated road and trail crossings are shown on the designated road system maps (See Maps 2-6, 2-13, and 2-18) for Alternatives 2, 3, and 4.
- 12. Prohibit recreational gold panning, dredging, or sluicing within Cienega Creek or its tributaries on public lands within the proposed areas of critical environmental concern (ACECs). ACEC boundaries for Alternatives 2, 3, and 4 are shown on Maps 2-10 and 2-16.
- 13. In riparian areas, prohibit camping within 100 feet of each side of the stream channel (whether flowing or dry).
- 14. Minimize the building of developments in the 100-year floodplain. Limit developments to those needed to reduce impacts on riparian and aquatic areas.
- 15. Ensure that activities in riparian areas do not cause streambank stability to drop below 90%. Methods to protect streambanks could include education and restrictions on

activities. Streambank stability is measured as a percentage of alteration to streambanks including broken-down, eroded, or denuded streambanks from any mix of activities.

- 16. Implement design changes on roads where change is found to be needed to halt excessive erosion or reduce other resource impacts.

### ***Fish and Wildlife Management Actions***

Under Alternatives 2, 3, and 4, BLM would carry out the following actions in managing fish and wildlife in support of the fish and wildlife objective:

- . Use the Section 7 consultation process with the U.S. Fish and Wildlife Service to ensure that actions undertaken do not jeopardize the existence of endangered or threatened species or species proposed for listing. ***(Common to All Alternatives)***
- . Cooperate with state and federal agencies, universities, conservation groups, and other organizations on proposals including fish and wildlife research, fish and wildlife habitat improvement projects, inventory and monitoring of species and habitats, and mitigation of impacts from other activities. ***(Common to All Alternatives)***
- . Implement the following measures to protect lesser long-nosed bat roosts and/or foraging habitat:
  - . Ensure that road or trail building and maintenance activities do not increase or facilitate public access to known day roosts of lesser long-nosed bats.
  - . Conduct pre-construction surveys for paniculate agaves to avoid or minimize their injury and mortality during any construction.
  - . Design vegetation treatments, including prescribed fire, to minimize harm to

**Table 2-19A**  
**Designated Road Crossings on Cienega Creek and Empire Gulch**  
**Las Cienegas Resource Management Plan**

Road Number	Route Designation (Alternative 1) -Current Management	Route Designation (Alternative 2) -Proposed Management )	Route Designation (Alternative 3)	Route Designation (Alternative 4)	Notes
EC-901 at Empire Gulch	Open to all motorized travel.	Open to all motorized travel.	Open to all motorized travel.	Open to all motorized travel.	Perennial water through culvert under concrete crossing. Flows over structure only during peak flood flows.
910D (Narrows)	Open to all motorized travel.	Closed to all travel. Obliterate and revegetate (as necessary).	Open to non-motorized travel	Closed to all travel. Obliterate and revegetate (as necessary).	Several crossings across perennial portion of Cienega Creek, but very marshy in stream. Under current management, proposed to be closed to motorized vehicles as part of restoration project.
910B (Fresno Gap)	Open to all motorized travel (up to creek).	Closed to all motorized travel. Open (across creek) for non - motorized travel*.	Closed to all motorized travel. Open (across creek) for non - motorized travel*.	Closed to all motorized travel. Obliterate and revegetate (as necessary).	Under current management, road crossing through Cienega Creek at Sanford Canyon has been closed to motorized vehicles for restoration and spur to Falls has been closed to motorized vehicles due to hazards
EC-901 at Cienega Creek	Open to all motorized travel.	Open to all motorized travel.	Open to all motorized travel.	Open to all motorized travel.	Concrete crossing. Water flows at crossing about ½ year
EC-901B at Cienega Creek (Ag. Fields)	Closed to all motorized travel. Open for non - motorized travel.	Closed to all motorized travel. Open for non - motorized travel (upstream).	Closed to all motorized travel. Open for non - motorized travel (upstream).	Closed to all motorized travel. Obliterate and revegetate (as necessary).	Under current management, road crossing has been closed due to restoration project. An alternative non-motorized crossing will be developed upstream under Alternatives 2 and 3.

**Table 2-19A, continued**  
**Road Crossings on Cienega Creek and Empire Gulch Under Alternative 2**  
**Las Cienegas Resource Management Plan**

<b>Road Number</b>	<b>Route Designation Current Management (Alternative 1)</b>	<b>Route Designation Proposed Management (Alternative 2)</b>	<b>Route Designation (Alternative 3)</b>	<b>Route Designation (Alternative 4)</b>	<b>Notes</b>
EC-901A at Cienega Creek (Oak Tree Canyon-Bahti's Bog)	Closed to all motorized travel for restoration.	Closed to all travel. Obliterate and revegetate (if necessary).	Closed to all travel. Obliterate and revegetate (if necessary).	Closed to all travel. Obliterate and revegetate (if necessary).	Perennial water in creek. Route across creek has already overgrown and revegetated.
EC-903 at Cienega Creek (Springwater Canyon)	Closed to all motorized travel for restoration.	Closed to all travel. Obliterate and revegetate (if necessary).	Closed to all travel. Obliterate and revegetate (if necessary).	Closed to all travel. Obliterate and revegetate (if necessary).	Perennial water in Creek. Route through sacaton and across creek is overgrown with vegetation.
EC-904 at Cienega Creek (Gardner Canyon)	Closed to all motorized travel for restoration.	Closed to all travel. Obliterate and revegetate (if necessary).	Closed to all motorized travel. Open (across creek) for non - motorized travel*.	Closed to all travel. Obliterate and revegetate (if necessary).	Perennial water in Creek. Route across creek is overgrown with vegetation.
EC-914A at Cienega Creek (Headwaters)	Open to all motorized travel.	Closed to all travel. Obliterate and revegetate (if necessary).	Closed to all travel. Obliterate and revegetate (if necessary).	Closed to all travel. Obliterate and revegetate (if necessary).	Dry sand crossing with flows only during storm events. Road approaches severely eroded
EC-914 at Cienega Creek (Above Headwaters)	Open to all motorized travel.	Open to all Motorized travel.	Open to all Motorized travel.	Open to all Motorized travel.	<b>Dry sand crossing with flows only during storm events.</b>
<b>EC-913 at Cienega Creek (Oil Well)</b>	<b>Open to all motorized travel.</b>	<b>Open to all motorized travel.</b>	<b>Open to all motorized travel.</b>	<b>Open to all motorized travel.</b>	<b>Dry sand crossing with flows only during storm events.</b>
<b>EC-900 at Cienega Creek (South Road)</b>	<b>Open to all motorized travel.</b>	<b>Open to all motorized travel.</b>	<b>Open to all motorized travel.</b>	<b>Open to all motorized travel.</b>	<b>Dry sand crossing with flows only during storm events.</b>

\* Non-motorized travel is hiking, equestrian, and mountain bike use.

*Fish and Wildlife Management Actions - Common to Alternatives 2, 3, and 4*

paniculate agaves and to ensure that no more than 20% of agaves that are burned during prescribed fire are killed by the fire.

- d. Develop a mitigation plan in coordination with the Fish and Wildlife Service for any vegetation treatment, including prescribed fire, within 0.5 mile of a bat roost or in areas that support paniculate agaves.
4. Implement the following measures to protect jaguar and jaguar habitat:
    - a. Maintain dense, low vegetation in the Cienega Creek riparian corridor for jaguar.
    - b. Do not subject jaguar to any predator control activities.
    - c. Investigate all reports or observations of jaguars in coordination with the Fish and Wildlife Service and the Arizona Game and Fish Department.
  5. Implement the following measures to protect Southwestern willow flycatcher and flycatcher habitat:
    - a. Manage suitable willow flycatcher habitat so that its suitable characteristics are not eliminated or degraded.
    - b. Manage potential willow flycatcher habitat to allow natural regeneration into suitable habitat, as rapidly as possible.
    - c. Control cowbirds within five miles of occupied habitat using suitable control methods, if cowbird concentrations indicate a strong likelihood that parasitism to flycatcher nests is occurring or if parasitism of a nest is documented.

Note: Other actions to protect Southwestern willow flycatcher and flycatcher habitat from

impacts of livestock grazing can be found in the livestock grazing management action sections of ~~the Activity Plans for Alternatives 2 and 3.~~

6. Implement the Gila topminnow recovery plan to increase security for the Cienega Creek Gila topminnow population by the following:
  - Protecting surface water quality and quantity.
  - Protecting the creek from contamination by non-native fish and frogs and their parasites.
  - Achieving and maintaining habitat integrity and function.
  - Accomplish this action through the following:
    - a. Securing enough instream flow rights for Cienega Creek to maintain the existing aquatic and riparian habitat in the creek for fish and wildlife (i.e., supports riparian and aquatic habitats and the Gila topminnow, longfin dace, Gila chub, native leopard frog, Sonoran mud turtle, Mexican garter snake, and other species dependent on flowing surface water).
    - b. In partnership with the Arizona Game and Fish Department (AGFD), controlling or removing exotic fishes and amphibians from stock tanks or streams in portions of the basin that drain into perennial parts of Cienega Creek. Coordinate with AGFD on the need to renovate (i.e., chemically treat) waters that contain exotic fishes and amphibians that threaten any native fishes or frogs.
    - c. Developing information and erecting signs on the need to protect Cienega Creek from exotic fish and other non-native aquatic organisms.

Chapter 2: Part B - Management Actions

- Minimizing road access and crossings in the creek to decrease the opportunity for live releases of game fish and bait. Proposals for minimizing road access and crossings vary by alternative and are shown on the designated road system maps for Alternatives 2, 3, and 4 (See Maps 2-6, 2-13, and 2-18).
- Working with the Pima County **and Santa Cruz County** Health Departments to ensure that mosquitofish are not used as a biological control for mosquitos in the basin.
- Evaluating and stocking three or more **range extensions reintroductions** within the basin with Gila topminnow in cooperation with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Sites currently selected for reintroduction include Nogales and Little Nogales Springs, Upper Empire Gulch, and Cinco Ponds. **Additional sites may be proposed in the future if determined to be suitable.**

Note: Other actions to protect Gila topminnow and topminnow habitat from impacts of livestock grazing can be found in the livestock grazing management action sections of **the activity plans** for Alternatives 2 and 3.

· Reestablish, extend the distribution within, historic ranges of, or supplement populations of the following wildlife species in the Sonoita Valley, where determined to have suitable habitat and be compatible with other management activities:

Aplomado falcon (*Falco femoralis*)  
Gould's turkey (*Meleagris gallopavo mexicana*)  
Gila topminnow (*Poeciliopsis occidentalis*)  
Desert pupfish (*Cyprinodon macularius*)  
Beaver (*Castor canadensis*)  
Gila chub (*Gila intermedia*)

Pronghorn antelope (*Antilocapra americana*)

**Lowland leopard frog (*Rana yavapaiensis*)**

**Chiricahua leopard frog (*Rana chiricahuensis*)**

~~Native leopard frogs (*Rana* spp.)~~

Black-tailed prairie dog (*Cynomys ludovicianus*)

(Other species may be considered as new information or management needs become known.)

Accomplish this action through the following steps:

- a. Determine the population status and resources available (e.g., habitat quality, water availability) to wildlife species proposed for reestablishing **range extension**, or supplementing.
- b. When habitat conditions have been determined to be suitable for the survival of any of the above species, coordinate the suitable action (reestablishing or **range extension**, supplementing) by established procedures with the suitable combination of agencies and land owners: Arizona Game and Fish Department, U.S. Fish and Wildlife Service, BLM, Arizona State Land Department, and affected private landowners.

· Coordinate with the Arizona Game and Fish Department to remove or control non-native species where monitoring finds that they threaten native species.

· Manage for a mosaic of priority habitats (e.g., riparian/wetland, grassland, oak woodland, mesquite bosques) by applying vegetation treatments (including prescribed fire) as outlined in the integrated vegetation treatment program; reestablish wildlife species where determined feasible through steps outlined above in **#2 #7**; and periodically rest areas from grazing.

*Fish and Wildlife Management Actions - Common to Alternatives 2, 3, and 4*

Take the following actions to meet Upland Vegetation Sub-Objective B for pronghorn antelope:

- a. Use prescribed fire and/or mechanical or chemical vegetation treatments as well as periodic rest from grazing to meet the habitat objective for pronghorn.
  - b. Provide usable water sources within one mile of each other in pronghorn fawning areas and do not exceed four miles between usable water sources in pronghorn habitat. Evaluate and monitor suitability of waters and distance to permanent and functioning waters.
  - c. Modify or remove fences that restrict pronghorn movement. Fences proposed for modification are shown on Map 2-24. Additional fences may be proposed for modification or removal in the future in response to monitoring data.
  - d. Maintain fences that protect pronghorn from hazards (e.g., highway fences) and erect other restrictive fencing where needed.
  - e. Investigate pronghorn use of highway underpasses and explore other partnership opportunities to help pronghorn cross highways. (Note: Include possibility of overpasses if highway is ever re-engineered. Using areas with cuts on each side would essentially form short tunnels for vehicles.)
- Recommend to the community through Sonoita Crossroads or another avenue that developments be encouraged to cluster homes to provide open movement areas that could double as community viewing locations for pronghorn.
- . Recommend to the community through Sonoita Crossroads or other avenue that antelope pronghorn-friendly fencing be installed in developments to ease antelope pronghorn movement in the community.
  - . Minimize human disturbances by allowing where possible only low-use primitive camping and low-use livestock holding and handling areas in pronghorn habitat.
  - i. Minimize road densities and redundant roads in pronghorn habitat by implementing the designated road network. Low-use dirt roads are preferable to high-use dirt, gravel, or paved roads.
  - j. Develop partnership educational materials on antelope pronghorn.
  - k. Do not authorize dog trials in pronghorn habitat on public lands during the fawning season (April-June).
- Require that dogs be leashed during the fawning season in key fawning areas on public lands (See Map 2-25).  
Note: Other actions for pronghorn relating to managing livestock grazing can be found in the livestock grazing management actions section of ~~the Activity plans for~~ Alternatives 2 and 3.
- To meet Upland Wildlife Habitat Sub-Objective A for grassland sparrow habitat, implement proposed vegetation treatments including prescribed fire and other upland restoration actions to reduce shrub canopy and enhance grass species diversity and cover, as described in the watershed restoration portion of this section.

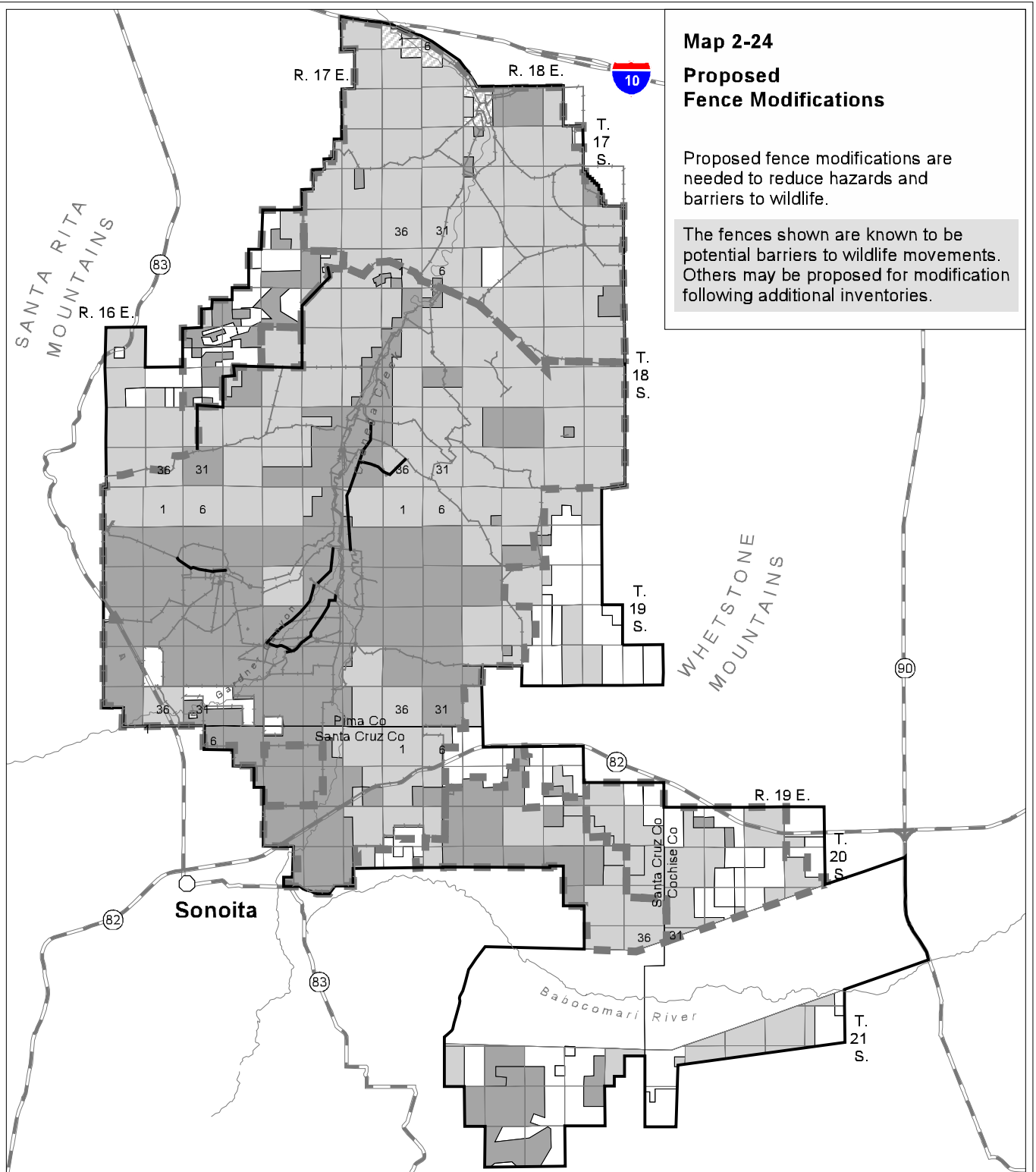


**Map 2-24**

**Proposed Fence Modifications**

Proposed fence modifications are needed to reduce hazards and barriers to wildlife.

The fences shown are known to be potential barriers to wildlife movements. Others may be proposed for modification following additional inventories.



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Grazing Allotment Boundary
- Pipeline, Existing
- Fence, Existing
- Proposed Fence Modification

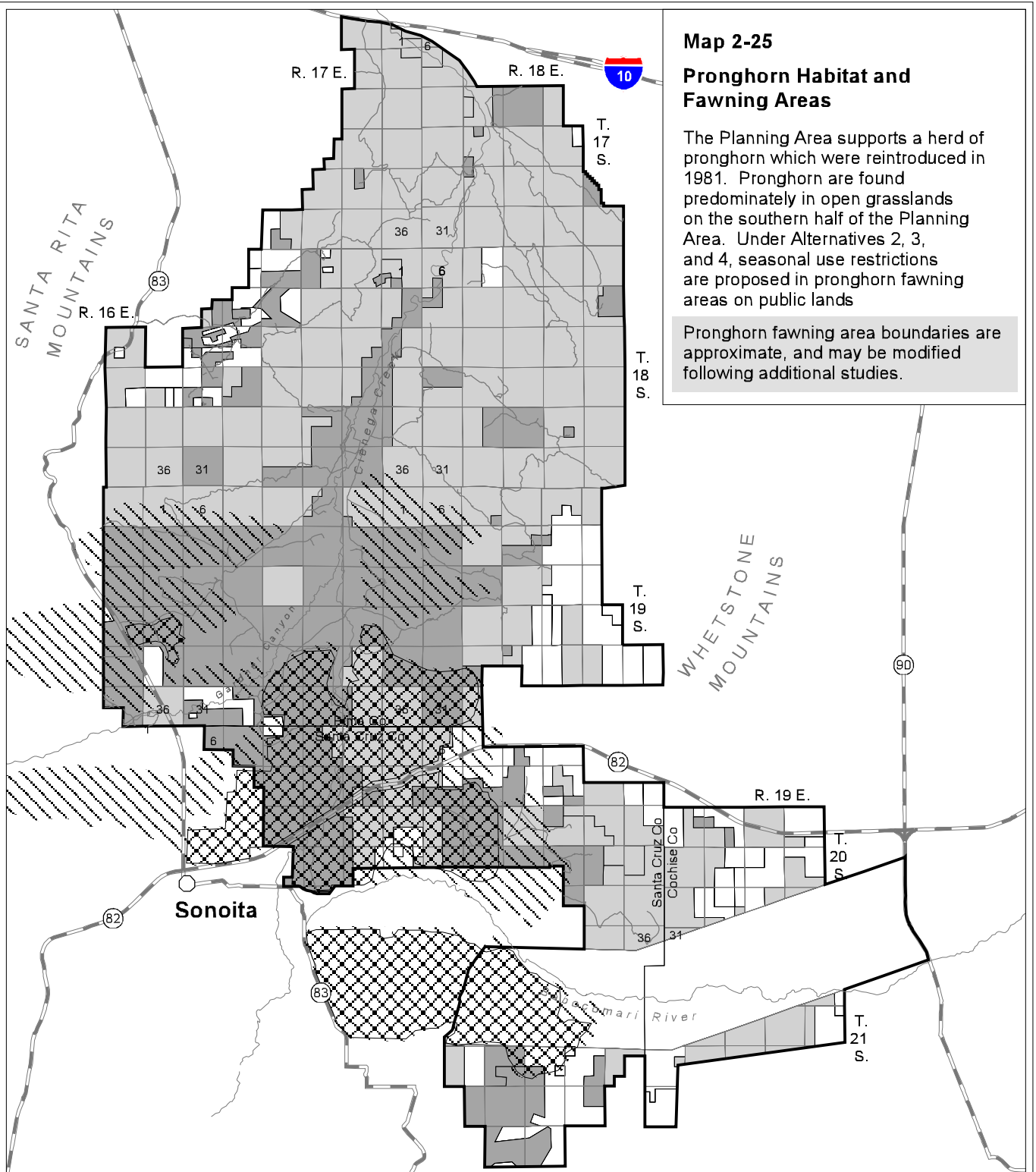
April 2002

**Map 2-25**


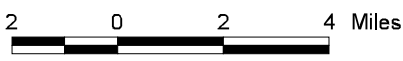
**Pronghorn Habitat and Fawning Areas**

The Planning Area supports a herd of pronghorn which were reintroduced in 1981. Pronghorn are found predominately in open grasslands on the southern half of the Planning Area. Under Alternatives 2, 3, and 4, seasonal use restrictions are proposed in pronghorn fawning areas on public lands

Pronghorn fawning area boundaries are approximate, and may be modified following additional studies.










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**LEGEND**

-  Planning Area Boundary
-  BLM Land
-  State Land
-  Private Land
-  Pronghorn Habitat
-  Pronghorn Fawning Area
-  Road Network

## Chapter 2: Part B - Management Actions

12. Improve wildlife populations by reducing habitat fragmentation, establishing adequate movement/dispersal areas, and ensuring water sources. Accomplish this by the following:
  - a. Modify or remove fences where feasible. Fences proposed for modification are shown on Map 2-24. Additional fences may be proposed for modification or removal in response to monitoring data.
  - b. Remove or modify roads and rights-of-way, as described in the road closures and restrictions portion for each alternative.
  - c. Reduce human disturbance on public land in critical areas or during critical times of the year.
  - d. Purchase conservation easements or land from willing sellers through the Land and Water Conservation Fund.
  - e. Maintain existing water sources and provide supplemental water sources as found to be needed through water sources inventory and evaluation.

### ***Cultural Resource Management Actions***

Management of cultural resources under Alternatives 2, 3, and 4 differs from that under Alternative 1 in several ways. The master plan for the Empire Ranch Headquarters provides for adaptive reuse of headquarters buildings and expanded interpretative, research, and education programs at the headquarters. A restoration program is proposed for selected buildings. And the headquarters is managed as a Zone 1 recreation area. Outside of the headquarters area, several sites are allocated to scientific use.

**Under Alternatives 2, 3, and 4, BLM would carry out the following actions in support of the cultural resources objective:**

### **Empire Ranch Headquarters**

1. Allocate the historically significant buildings at the Empire Ranch Headquarters to public use. (***Common to All Alternatives***)
2. Under Alternatives 2-4, the Cultural Resource Project Plan (CRPP) in the form of a “Master Plan” will provide for developing and implementing adaptive uses of the headquarters area and buildings for an array of compatible educational, research, interpretive, and administrative programs. Under Alternatives 2-4, the headquarters would be developed for public uses as a quality museum experience with a heritage discovery trail and expanded educational programs as described below: (***Common to Alternatives 2, 3, and 4***)
  - a. The Empire Ranch House would be stabilized, restored, and interpreted as a historic house or museum according to an adaptive reuse plan. Interpretive themes would include the ranch, local and regional history, events, and people.
  - b. The *Heritage Discovery Trail* would be developed and interpreted for visitors, school groups, and recreationists. The Empire Ranch Headquarters buildings, landscapes, structures, and features and provide wayside exhibits, signs, and observation points interpreting natural and cultural resources.
  - c. *Education on the Empire* would be adopted as an educational program built around historic and natural topics, which would feature the Discovery Corral and other programs for children and students, lifelong learning and professional training, and support for teachers.
3. Evaluate and submit materials nominating the complex of historic buildings (built or placed before 1950) at the Empire Ranch Headquarters to the National Register of

*Cultural Resource Management Actions - Common to Alternatives 2, 3, and 4*

Historic Places by 2003 (**dependent on adequate funding**). (The Empire Ranch House is listed on the National Register). *(Common to All Alternatives)*

- . At the Empire Ranch Headquarters, continue to stabilize and preserve historic buildings eligible for or listed on the National Register of Historic Places and complete a restoration program for selected buildings. Use grant, partnership, volunteer, and funding and labor sources.

*(Common to Alternatives 2, 3, and 4)*

- . Stabilize and maintain all eligible or listed historic structures in accord with the Secretary of the Interior's *Standards and Guidelines for the Treatment of Historic Properties* and *Standards and Guidelines for Rehabilitating Historic Buildings on the National Register*. *(Common to All Alternatives)*

- . Manage and maintain at BLM standards for safety, accessibility, and occupancy, buildings and structures within the complex that are not eligible for listing on the National Register of Historic Places, including recreational facilities, storage buildings, sheds, shops, and occupied structures.

*(Common to All Alternatives)*

- . Continue partnership with the Empire Ranch Foundation and other interested groups in the following:

*(Common to All Alternatives)*

- . Planning use of the headquarters complex.

- b. Stabilizing/preserving structures at the headquarters.

- . Collecting, preserving, and interpreting historic information and materials about the Empire Ranch and the surrounding area.

- . Volunteer projects.

- . Educational programs.

- . Actively maintain and provide opportunities for the public to volunteer for projects to preserve, conserve, and study the planning area's cultural resources.

*(Common to All Alternatives)*

- . Manage the ranch headquarters to include support of historic ranching operations, administration of BLM programs, and protection in the planning area, and public uses emphasizing education, research, interpretation, and visitation.

*(Common to All Alternatives)*

- . ~~Continue producing limited~~ **Produce a variety of** interpretive materials (e.g., brochures, web site information, news/features) about Empire Ranch history. *(Common to All Alternatives)* **(Common to Alternatives 2, 3, and 4)**

*Cultural Properties Outside the Headquarters Area*

- . Allocate the Mattie Canyon site complex, the Sandford Homestead site, and the Pump Canyon site to scientific use and open them to scientific and historical study by qualified researchers and scholars. (See Appendix 2 for detailed description of this action).

*(Common to Alternatives 2, 3, and 4)*

- . If determined feasible, ~~develop~~ selected sites could be developed for interpretation and public visitations. BLM would implement this action only if funds and staff are available to adequately develop an interpretive program that would not harm the resources.

## Chapter 2: Part B - Management Actions

3. Conduct Class III cultural resource surveys along ~~93.9~~ **91.9** miles of roads and trails by 2004 **(dependent on adequate funding)**.
4. Conduct Class III cultural resource surveys of about 40,000 acres by 2005 **(dependent on adequate funding)**. BLM would use data from these surveys to make future allocation and use decisions.
5. Conduct an ethnoecological study of the planning area, complete with report, by ~~2003~~ **2004** **(dependent on adequate funding)**. *(Common to All Alternatives)*
6. Work with Native Americans, including the Tohono O'odham Nation, the Hopi Tribe, and the San Carlos Apache Tribe, to select harvesting areas and allow noncommercial collection of bear grass, cottonwood, acorns and medicinal/ceremonial herbs by ~~2001~~ **2003**. *(Common to All Alternatives)*
7. Develop the headquarters as a Zone 1 recreational area, in general, but with specific plans for headquarters access, trail loops, interpretive facilities, information signs, visitor facilities, and designated day, overnight and weekly uses. *(Common to Alternatives 2, 3, and 4)*

### **Access and Transportation Management Actions**

The following actions are proposed **under Alternatives 2, 3, and 4** in support of the recreational opportunities objective:

1. BLM will pursue acquisition of perpetual rights-of-ways across State Trust Land parcels on the south entrance road (EC-900), Cienega Ranch Road (EC-901), Cieneguita Road (EC-904), and Oak Tree Canyon Road (EC-02) to ensure continued public access (Map 2-26).

BLM may seek additional legal access in the future, if warranted by changes in land

tenure due to BLM's acquisition of ~~more~~ State Trust or private land.

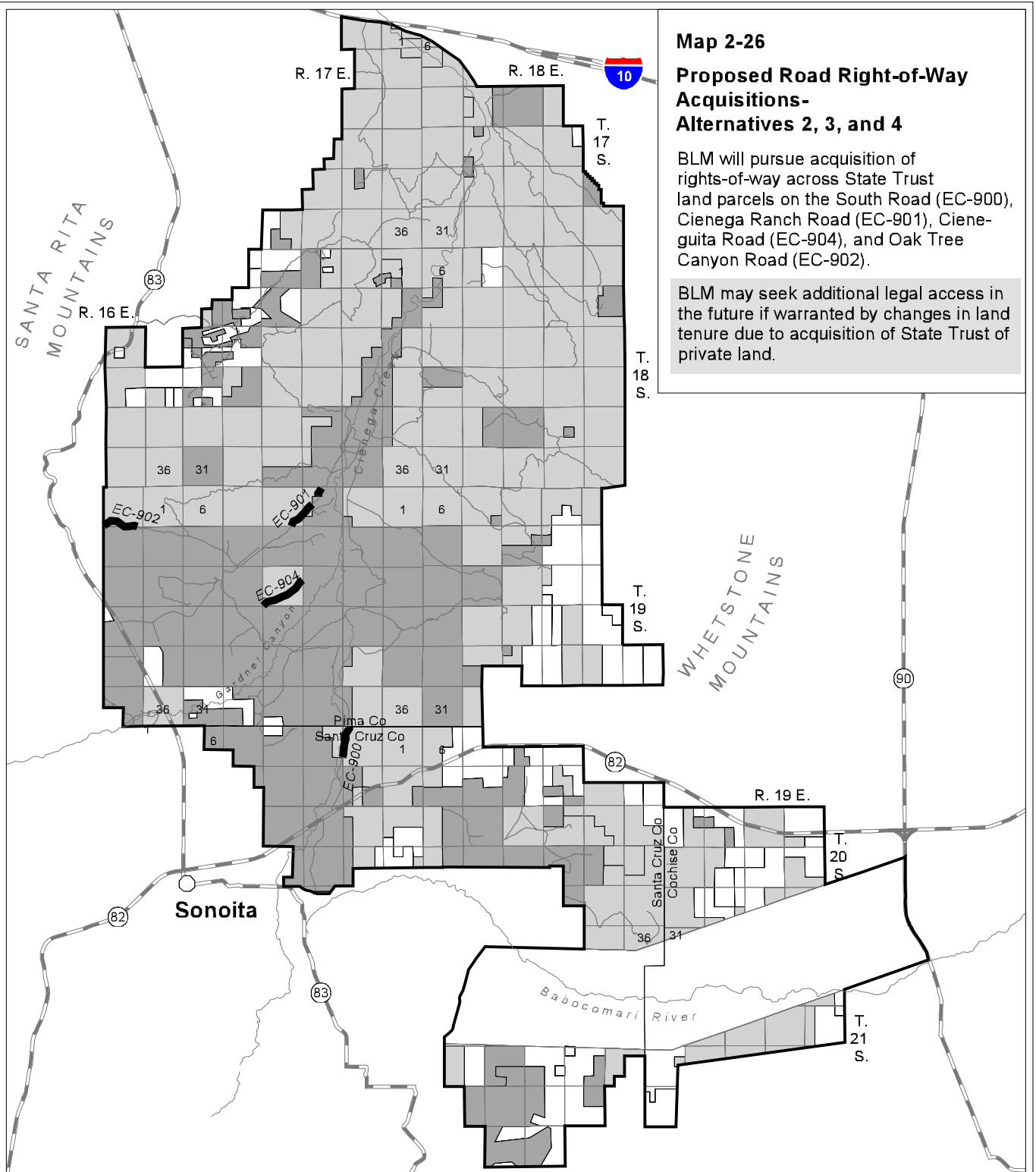
2. BLM-produced information and interpretive materials will continue to describe access to the Empire-Cienega Planning Area as the Highway 82 and 83 access points. In addition, BLM will call the Oak Tree Canyon entrance a limited access point for off-highway vehicles (OHVs) from the ~~established Forest Service OHV staging~~ **Forest Service trail head parking** area in Oak Tree Canyon. (The crossing under the highway fluctuates from non-motorized access to only small-wheel-base vehicles (ATVs) and motorcycles, depending on flood damage to the culvert.) If issues result from (1) public use of other access points, including resource damage on public lands, (2) user conflicts, or (3) conflicts with surrounding land owners, BLM will take steps to resolve these issues, including education, restrictions, and, as a last resort, closures.
3. All non-motorized trails will be open to hiking, equestrian, and mountain bike use **with the exception of routes on the Appleton-Whittell Research ACEC where horseback use of roads and trails is not allowed for the protection of research values.**
4. On a case-by-case basis, BLM will evaluate future **trail designation** proposals for designation of motorized or non-motorized trails, including the Great Western Trail, for conformity with planning area resource objectives and for conflicts with management prescriptions under the selected alternative. Generally, **new these** trail designations will be considered only for **existing routes on the designated transportation system**. Proposals for new trail construction would be considered only if the new construction is to replace a segment of trail or road that is being or will be reclaimed.

Map 2-26

**Proposed Road Right-of-Way Acquisitions- Alternatives 2, 3, and 4**

BLM will pursue acquisition of rights-of-way across State Trust land parcels on the South Road (EC-900), Cienega Ranch Road (EC-901), Cienegueta Road (EC-904), and Oak Tree Canyon Road (EC-902).

BLM may seek additional legal access in the future if warranted by changes in land tenure due to acquisition of State Trust of private land.



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Existing Road
- Proposed ROW Acquisition

*Chapter 2: Part B - Management Actions*

- . BLM will complete a transportation system project plan for the planning area **by 2004**. The plan will include road numbering, signing, implementing closures and restrictions, and a road maintenance schedule using the Facility Inventory Maintenance Management System (FIMMS) (See Appendix 2).

***Recreation Management Actions--***

The following actions are proposed **under Alternatives 2, 3, and 4** in support of the recreational opportunities objective:

- . **Special Land Use Permit**--The mixed land ownership pattern within the planning area, and particularly the intermixed BLM and State Trust Lands that are managed under differing mandates, creates recreation management challenges. To improve recreation management and provide for more seamless recreation opportunities, BLM will work with the Arizona State Land Department (ASLD) to pursue acquisition of a special land use permit (SLUP) for State Trust Lands within the planning area to provide public recreation opportunities on these lands. Currently, recreationists using State Trust Lands for purposes other than hunting must obtain a permit and pay a fee to the ASLD. Hunters must have a valid license issued by the Arizona Game and Fish Department and be engaged in hunting.



2. **Special Recreation Use Permit System**-- BLM will analyze the feasibility of implementing a permit system for individual recreational use on the public lands within the planning area. The purpose of the permit system will be to provide a visitor management tool for ensuring the conservation of resources and the continued quality of recreation opportunities, both of which are impacted by increasing levels of human use of the area. The permit system will be developed using a public collaborative process with both fee and non-fee systems examined as options. If a SLUP with the Arizona State Land Department is obtained, then an integrated permit system will be pursued to ensure that the public would need only one permit for the area.

If the option of a fee program is pursued, it will be under the Land and Water Conservation Fund (LWCF) Act. The LWCF Act of 1965 gives BLM the primary authority to charge fees for use of recreational facilities and public lands, and for Golden Age and Golden Eagle Passports. Until the late 1980s, fees collected under this authority were deposited into the LWCF account, and BLM could not use them for managing recreation sites or programs. In 1988 Congress established a Recreation Operations Subactivity and began to reappropriate funds to BLM on the basis of a previous year's deposit. The funds can now be used for resource protection and for managing recreation sites and programs in the area where the fees originated.

3. **Special Recreation Permits**--Many types of Special Recreation Permits may be applied for on Las Cienegas NCA for commercial, competitive and organized group events. These applications would continue to be considered on a case-by-case basis and issuance of permits is discretionary. Many applications for incompatible uses may be sought in areas that may not be suitable for

the use and may conflict with the maintenance of certain desired resource conditions and recreation settings established under Alternatives 2, 3, and 4. Indirect promotion of more primitive areas may also occur. Table 2- 19B is designed to provide guidance and flexibility in considering the types, number, group sizes and frequencies of Special Recreation Permits in each Recreation Zone.

4. **Management of Dispersed Recreation**

A variety of dispersed recreation activities are ongoing on public lands within the planning area and most would continue to be available under Alternatives 2, 3, and 4 where consistent with Las Cienegas NCA Act, management prescriptions in this plan, and federal regulations and policy. Table 2- 19C lists a variety of dispersed recreation activities which are generally suitable within each recreation zone. Other recreation activities which are generally suitable for public lands in the planning area are included in BLM's Recreation Management Information System (RMIS) (Appendix 2). The following is a summary of visitor use restrictions for public lands in the planning area that are common to Alternatives 2, 3, and 4. These prescriptions are found in various sections of this plan for resource or visitor management and protection. Other federal and state visitor use regulations also apply:

- Motorized vehicles are limited to designated routes in all alternatives. Bicycles and other mechanized vehicles are limited to designated routes in Alternatives 2 and 4. Driving "off road," which means driving a vehicle off a designated road and onto unroaded terrain, is not permitted. Motorized use on primary access roads 900, 901, 902 require all vehicles to be currently licensed, insured and registered.



**Table 2-19B**  
**Special Recreation Permit Guidance by Recreation Management Zone**  
**Las Cienegas Resource Management Plan**

<b>Types of Special Recreation Permits</b>	<b>Zone 1 Roaded Natural</b>	<b>Zone 2 Natural</b>	<b>Zone 3 Backcountry</b>
Commercial Guided Tours (Motorized)	Yes	Yes	Yes
Commercial Guided Tours (Non-Motorized)	Yes	Yes	Yes
Commercial Hunting Outfitters and Guides	SCO <sup>1</sup>	Yes	Yes
Competitive Events (Motorized)	SCO	SCO	SCO
Competitive Events (Non-Motorized)	SCO	Yes	Yes
Organized OHV Event	SCO	SCO	SCO
Organized Group Event	SCO	Yes	Yes
Interpretation, Education & Nature Study (Motorized)	Yes	Yes	Yes
Interpretation, Education & Nature Study (Non-Motorized)	Yes	Yes	Yes
Maximum Trips Per Day	3	2	2
Number of Overlapping <sup>2</sup> Permits Per Use Area	3	2	2
Site Fee Reservation	Optional	Optional	Optional
Group Size (Requires Special Recreation Permit When Meets or Exceeds This Number <sup>3</sup> )	30 or more people up to the maximum group size allowed in staging area	30 or more people up to the maximum group size allowed in staging area	30 or more people up to the maximum group size allowed in staging area

<sup>1</sup>SCO = Special Circumstances Only. This type of activity is not suitable for the Zone, however, under special circumstances exceptions may be made.

<sup>2</sup>Overlapping means more than one permit using the same area at the same time.

<sup>3</sup> Other conditions may warrant a special recreation permit, including commercial and competitive events.

- **In Zones 1 and 2, designated pullouts are to be used for parking. In Zone 3, you may park along roads but may not drive a vehicle off a road more than 25 feet to park.**

- **Speed limits on roads are 25 mph unless otherwise posted.**
- **The carrying capacity of roads or planned desired condition of roads will dictate type of use. Most back roads will be maintained, at a**

minimum, where high clearance vehicles to 4-wheel drive vehicles will be necessary, therefore, precluding low clearance vehicle use such as motor homes and sedans. Camping is not allowed in recreation Zone 1, is restricted to designated camping areas in Zone 2, but is allowed in Zone 3. However, camping is not allowed within 100 feet of streams in all recreation zones.

- Recreational mining is not allowed.
- Restrictions are placed on the amounts and types of plant materials which may be collected.
- Restrictions are placed on the amounts, types and methods by which rocks can be collected.
- Dogs must be leashed in pronghorn fawning areas from April to June.
- Cienega Creek has been closed to fishing by Arizona Game and Fish Commission order.
- Recreation activities which damage resources, endanger public health and safety, or litter are prohibited. Conducting simulated combat activities using paint ball guns and smoke bombs is inconsistent with the Leave No Trace land use practices encouraged by BLM and other land management agencies. Leaving empty cartridges, bullets, permanent stains, and other by-products in an area is considered littering or damaging resources and is subject to fines.

• **Interpretive Program.** BLM will develop an interpretive program for the planning area by 2002. Interpretation is a voice for all resource management objectives and programs in this plan. This program will support the overall vision, goals, and objectives of this plan by serving customers, promoting the health of the land, and enhancing the understanding of this area's natural and cultural resources and its

management. This program integrates all resource objectives with prescriptions such as placing signs and other information and education products directed to affect visitor behavior. BLM will provide services for people of all abilities by using diverse media and combining techniques to reach different learning styles, abilities, generations, ethnic groups, and cultures. This program will follow the National BLM Interpretive Strategy (BLM 1999) and do the following:

- Be thematic and use accepted professional interpretive principles.
- Be evaluated to measure effectiveness.
- Ensure that each resource message will be displayed effectively and harmonize with objectives for other resource management programs
- Collaborate with other groups such as BLM public affairs; neighboring public and state land managers; outfitters; guides; and cooperating associations, friend's groups, and foundations to provide information to diverse audiences.
- Determine the level and suitability of publicity, marketing, brochures, BLM website information, road signs, maps, and priority resource protection messages as they relate to the planning area's management objectives.
- Locate and compile basic information on safety and orientation and integrate this information with all resource management objectives and programs, such as recreation opportunities, grazing practices, and creek restoration projects. Methods and styles of communication such as brochures, web pages, signs, and other media selected can be informational, directional, interpretive, or authoritative messages that best minimize impacts to resources and enhance resource protection.

**Table 2-19C**  
**Primary Recreation Activities by Zone**  
**Las Cienegas Resource Management Plan**

Zone 1 Roaded Natural	Zone 2 Natural	Zone 3 Backcountry
Sightseeing	Sightseeing	Sightseeing
Visiting historic sites	Camping	Camping
Photography	Visiting historic sites	Visiting historic sites
Camping	Viewing wildlife	Viewing wildlife
Day use	Photography	Photography
	Driving for pleasure	Driving for pleasure
	Picnicking	Picnicking
	Hunting	Hunting
	Equestrian activities	Hiking
	Mountain biking	Backpacking
		Solitude
		Equestrian activities
		Mountain biking

Be led by an interpretive specialist or team. Trained interpretive specialists should develop the details of sign styles and exact text, with input from all resource specialists.

**Maintenance Program**--The recreation program will use BLM's Facility Inventory Maintenance Management System (FIMMS) and integrate with the maintenance needs of other resource objective's to develop a recreation maintenance plan by 2002. Also integrated into FIMMS should be the maintaining of all signs and other infrastructure for motorized and non-motorized travel for all resource programs in this plan amendment. The recreation maintenance plan covers how to manage garbage, camping areas, water sources, barricades, parking areas, fences, trails, roads, and administrative sites. This plan also determines the degree of scheduled and corrective maintenance. **A facility and inventory maintenance management program will be developed and modified using BLM's Facility Inventory Maintenance Management System (FIMMS) basic structure, however maintenance standards, levels and schedules will be locally defined. The overall**

**maintenance program will integrate the maintenance needs and prescriptions for all resource programs.**

**An inventory and maintenance management program integrating Las Cienegas prescribed conditions for recreation zones, roads and their maintenance needs will be developed by 2004. This will include maintaining informational and regulatory road signs and other infrastructure within the NCA. A recreation maintenance plan will also address trash removal, clean-up procedures and schedules. This plan also determines the degree of scheduled and corrective maintenance for water sources, restoration project components, barricades, parking areas, fences, trails, and administrative sites. Table 2-20 summarizes maintenance prescriptions for designated routes in the transportation system. Appendix 2 includes detailed descriptions of each maintenance level.**

### *Mineral Resources Management Actions*

**Administrative Use of Mineral Materials**--BLM will use mineral materials such as clay, sand, gravel, and boulders for projects within the planning area. BLM expects to use no

**Table 2-20 Route Maintenance Guidance by Zone, Las Cienegas Resource Management Plan**

Zone	Functional Class <sup>1</sup> and Access Vehicle Types	Maintenance Level <sup>2</sup>	Road Width (ft)	Speed (mph)	Route Designation Highlights (Review alternative Route Designations Maps for more details).				Comments	Hiking, Horseback and Bicycle Trail Types	
					Alt 1	Alt 2	Alt 3	Alt 4			
1 Roaded Natural	<b>Local<sup>3</sup></b> all vehicle types	3	up to 20	25-35	900	900	900	900	main access road off Hwy 83 to Ranch Headquarters	native tread surface to non-native tread for interpretive trails	
	<b>Resource</b> high clearance	2	10	10-15	see map				unimproved dirt side roads <sup>4</sup>		
	<b>Resource</b> high clearance or 4x4	2	-	-					administrative motorized use and open to non-motorized public use		
	<b>Non-System</b>	1	-	-	901B,907, 907B				routes to be closed and rehabilitated,		
2 Natural	<b>Local<sup>3</sup></b> passenger vehicle, RV	3	14	15-25	900	900, 901, 902	900	900, 902	South Road - segment off Hwy 82	native tread surface,widths to be determined	
	<b>Resource</b> hiking, biking, or horseback	2	To be determined	-					910B, 901B		non-motorized use year round
	<b>Resource</b> high clearance	2	10	5-15					unimproved dirt side roads <sup>4</sup>		
	<b>Non-System</b>	1	-	-					routes to be closed and rehabilitated,		

**Table 2-20 continued Route Maintenance Guidance by Zone, Las Cienegas Resource Management Plan**

Zone	Functional Class <sup>1</sup> and Access Vehicle Types	Maintenance Level <sup>2</sup>	Road Width (ft)	Speed (mph)	Route Designation Highlights (Review alternative Route Designations Maps for more details).				Comments	Hiking, Horseback and Bicycle Trail Types
					Alt 1	Alt 2	Alt 3	Alt 4		
3 Back Country	Resource high clearance, 4x4	2	10	5-15		916 segment, motorized seasonal use	916 loop motorized seasonal use		roads to group sites and other dirt side roads and roads which are seasonal use	native tread surface, widths to be determined
	Resource high clearance, 4x4	2	10, two track	-					administrative motorized use and open to non-motorized public use	
	Non-System	1	-	-		910B extension across creek	901B,907, 907B		routes to be closed and rehabilitated,	

<sup>1</sup>BLM Road terminology from BLM Manual Section 9113

**Collector:** These BLM roads normally provide primary access to large blocks of land and connect with a public road system. Highway 82, 82 are the collector roads within LCNCA.

**Local:** These BLM roads normally serve a smaller area than collectors. Local roads carry fewer traffic types. User cost, comfort, and travel time are secondary to construction and maintenance cost considerations.

**Resource:** These BLM roads normally are spur roads that provide point access and connect to local or collector roads. Use restrictions can be applied to prevent conflicts between users. Minimal consideration for user cost, comfort or travel time.

**Non-system::** Routes that will not be included in the LCNCA transportation system.

<sup>2</sup>Road Maintenance Levels :

**Level 1 - No Maintenance:** Roads no longer needed and closed to traffic. Closure devices maintained, drainage stabilized to protect adjacent lands and resource values.

**Level 2 - Minimal Maintenance:** Roads normally open seasonally or year-round and passable for high clearance or 4-wheel drive use. Drainage and grade inspected every 3 years and maintained to correct problems.

**Level 3 - Maintenance as Needed:** Roads open seasonally or year round. Typically natural or aggregate surfaced, but may include low-use bituminous surface, with defined cross-section and drainage. Generally passable by passenger car, but user comfort and convenience are not a high priority. Drainage inspected at least annually and maintained as needed. Grading conducted to provide a reasonable level of riding comfort.

**Level 4 - Annual maintenance.** Roads open all year, except may be closed or have limited access seasonally. Typically single or double lane, aggregate, or bituminous surface, with a higher volume of public traffic than administrative traffic. Roadway maintained at least annually, although a preventative maintenance program may be established. Problems repaired as discovered.

<sup>3</sup>Motorized use on primary access roads 900, 901, 902 require all vehicles to be currently licensed, insured and registered.

<sup>4</sup>Unimproved dirt side roads in Zones 1 and 2 transition to Zone 3 after 1/4 mile from intersection with roads 900, 901, 902.

more than 25,000 cubic yards of mineral materials for any one project. **Surface disturbance from removal of the mineral material would be limited to one-half acre or less for each project.** Mineral materials will be used for road repair/maintenance, watershed improvement, and cultural restoration. Mineral materials will be extracted so as to avoid sensitive areas and minimize impacts. BLM will analyze impacts from administrative use of mineral materials on a case-by-case basis.

**Casual Use of Mineral Materials**--Anyone who wishes to remove mineral materials for personal use must obtain a free use permit from the BLM Tucson Field Office. BLM will issue free use permits for up to 1 cubic yard of mineral materials. Permittees will be directed to washes in non-sensitive areas to collect their mineral material. Removal of mineral materials for personal or commercial use will not be permitted.

**Rockhounding**--Rock collectors will follow BLM Arizona guidelines for collecting reasonable amounts of mineral specimens, rocks, petrified wood, invertebrate fossils, and semiprecious gemstones. These guidelines allow collecting specimens for noncommercial personal use,--up to 25 pounds **and one piece** per day not to exceed 250 pounds per year. **Mechanical means may not be used to remove rocks or mineral specimens. Collection of petrified wood or fossils (invertebrate or vertebrate) will not be permitted except where intended for legitimate scientific uses as described below.**

**Scientific Collection**--Collection of paleontological resources and rocks will be allowed for legitimate scientific uses when covered by an approved research permit. Mechanical means may be used to remove rocks or mineral specimens for scientific collection subject to compliance with the National Environmental Policy Act.

## Alternative 2 Livestock Grazing and Recreation Management Actions

### *Livestock Grazing Management Actions*

Alternative 2 seeks to maximize livestock management responsiveness to changes in the annual vegetation production. Instead of fixed, established stocking rates on the public lands, stocking rates would be set annually in response to changes in total forage production, amount of forage available, and results of monitoring the health of the resource. This management is being practiced voluntarily on the Empire-Cienega allotment through the biological planning process and to some degree on the Empirita allotment.

As an example of how Alternative 2 would be implemented, Tables 2-21, 2-22, and 2-23 compare three different rates of possible annual production (favorable, normal, and unfavorable years) to the corresponding stocking rate that would be implemented as a result of that year's forage production on each of the allotments. The goal is to quickly respond to annual fluctuations in production by altering the stocking rate and livestock rotation. Actual stocking rates may be higher or lower than those shown in this example, depending on evaluation of resource conditions and monitoring data through the biological planning process. Also under Alternative 2, more livestock enclosures would be established to help monitor vegetation responses (See Tables 2-15 through 2-19).

Under Alternative 2, the stocking rate would vary with changes in vegetation production. Table 2-24 shows the total vegetation production in favorable, normal, and unfavorable years (based on rainfall) on all lands within each allotment. Also shown is the average amount of forage that livestock could consume on these lands with variable stocking rates. The **available useable** forage is assumed to be 50% of the total vegetation produced multiplied by the 35% utilization rate on lands allocated for livestock grazing. The percentage of **available useable** forage consumed remains fairly constant under this management strategy.

**Table 2-21**  
**Variable Grazing Use under Alternative 2, FAVORABLE YEAR<sup>1</sup> Example**  
**Las Cienegas Resource Management Plan**

Allotment	Total Acres Grazed	Total Production <sup>2</sup> Grazed Acres-- Favorable Year (Million-lbs.)	Total Cows	BLM Acres Grazed	BLM Cows on BLM (CYL <sup>3</sup> )	ASLD Acres	ASLD Cows on ASLD	Private Acres	Cows on Private Gows
Empire	71,827	129.29	1,496	34,365	716	37,462	780	0	0
Empirita	24,468	29.36	367	1,000	15	23,468	352	0	0
Rose Tree	8,469	15.24	176	3,550	74	3,719	77	1,200	25
Vera Earl	1,240	2.16	25	1,240	26	0	N/A	N/A	N/A
Empire Mountains	3,044	3.65	46	2,000	30	0	0	1,044	16
<b>TOTAL:</b>	<b>109,048</b>	<b>179.71</b>	<b>2,110</b>	<b>42,155</b>	<b>861</b>	<b>64,649</b>	<b>1,209</b>	<b>2,244</b>	<b>41</b>

<sup>1</sup> The "favorable, normal, and unfavorable" years mainly reflect rainfall. This variable is used to show that production varies greatly in response to the amount and timing of precipitation and how different livestock stocking rates affect the amount of vegetation cover remaining to achieve the watershed and wildlife objectives in the plan. In a Favorable Year, the assumed average production is 1800 lbs/ac and 0.25 AUM/ac on the Empire, Rose Tree, and Vera Earl ranches on the basis of NRCS Ecological Site Guides, and 1200 lbs/ac and 0.18 AUM/ac on the Empirita and Empire Mountain grazing units. In a Normal Year, the assumed average production is 1200 lbs/ac and 0.15 AUM/ac on the Empire, Rose Tree, and Vera Earl allotments based on NRCS Ecological Site Guides, and 800 lbs/ac and 0.12 AUM/ac on the Empirita and Empire Mountain grazing units. In an Unfavorable Year, the assumed average production is 800 lbs/ac and 0.10 AUM/ac on the Empire, Rose Tree, and Vera Earl ranches on the basis of NRCS Ecological Site Guides, and 500 lbs/ac and 0.09 AUM/ac on the Empirita and Empire Mountain grazing units.

<sup>2</sup> Total vegetation production comes from the NRCS Ecological Site guides for "favorable, normal, and unfavorable" years and is provided in the site guides only for reference areas considered to have an excellent similarity correlation to the "Historic Climax Plant Community" for each ecological site. Production encompasses all forms of vegetation production, including trees and shrubs so cattle never use a certain amount of production. But production still provides a relative index of cover produced. The available useable forage is assumed to be 50% of the total forage produced multiplied by a 35% utilization rate on lands allocated for livestock grazing.

<sup>3</sup> CYL = Cattle year-long.

**(Note that 50% is subtracted from the total production prior to applying the use limit. This provides for rangeland health by leaving the cover for watershed values).**

**Highlights of Alternative 2 Livestock Grazing Management**

1. Four livestock operators would continue to lease public lands in the planning area on four individual grazing allotments (i.e., Empire-Cienega, Empirita, Rose Tree, and Vera Earl). In addition, BLM would establish a livestock grazing allotment in the Empire Mountains.

2. On each allotment a variable stocking rate with a flexible livestock rotation-selective rest-rotation strategy would be implemented. Alternative 2 would establish a variable stocking rate determined annually by an assessment of range conditions, including forage availability and biological monitoring through the biological planning process.

On each allotment, forage utilization limits would be lowered from current limits as recommended by Holechek et al. (1999). Alternative 2 would implement a utilization limit of 30-40% of current

**Table 2-22**  
**Variable Grazing Use under Alternative 2, NORMAL YEAR Example**  
**Las Cienegas Resource Management Plan**

Allotment	Total Acres Grazed	Total Production Grazed Acres-Normal Year (Million-lbs.)	Total Cows	BLM Acres Grazed	BLM Cows on BLM (CYL)	ASLD Acres	ASLD Cows on ASLD (CYL)	Private Acres	Cows on Private Cows (CYL)
Empire	71,827	86.19	898	34,365	430	37,462	468	0	0
Empirita	24,468	19.57	245	1,000	10	23,468	235	0	0
Rose Tree	8,469	10.16	106	3,550	44	3,719	47	1,200	15
Vera Earl	1,240	1.49	16	1,240	16	0	N/A	N/A	N/A
Empire Mountains	3,044	2.44	30	2,000	20	0	0	1,044	10
<b>TOTAL:</b>	<b>109,048</b>	<b>119.85</b>	<b>1295</b>	<b>42,155</b>	<b>520</b>	<b>64,649</b>	<b>750</b>	<b>2,244</b>	<b>25</b>

**Table 2-23**  
**Variable Grazing Use under Alternative 2, UNFAVORABLE YEAR Example**  
**Las Cienegas Resource Management Plan**

Allotment	Total Acres Grazed	Total Production on Grazed Acres-Unfavorable Year (Million-lbs.)	Total Cows	BLM Acres Grazed	BLM Cows on BLM (CYL)	ASLD Acres	ASLD Cows on ASLD (CYL)	Private Acres	Private Cows
Empire	71,827	57.46	599	34,365	286	37,462	312	0	0
Empirita	24,468	12.23	184	1,000	8	23,468	176	0	0
Rose Tree	8,469	6.78	71	3,550	30	3,719	31	1,200	10
Vera Earl	1,240	0.99	10	1,240	10	0	0	N/A	N/A
Empire Mountains	3,044	1.52	23	2,000	15	0	0	1,044	8
<b>TOTAL:</b>	<b>109,048</b>	<b>78.98</b>	<b>887</b>	<b>42,155</b>	<b>349</b>	<b>64,649</b>	<b>519</b>	<b>2,244</b>	<b>18</b>



**Table 2-24  
Comparison of Vegetation Production Under Three Rainfall Regimes and  
Forage Consumption by Livestock Under Alternative 2 Livestock Management  
Las Cienegas Resource Management Plan**

	Total Acres Grazed	Total Cows	Total Production Grazed Acres (Million-lbs.)	Production Consumed By Total Cows (Million-lbs.)	% Total Production Consumed	Available Useable <sup>1</sup> Forage (Million-lbs.)	% Available Useable Forage Consumed <sup>2</sup>
Favorable Year	109,048	2,110	179.71	20.26	11	31.45	64
Normal Year	109,048	1,295	119.85	12.43	10	20.97	60
Unfavorable Year	109,048	887	78.98	8.52	10	13.82	62

<sup>1</sup> Useable Forage = (TOTAL PRODUCTION x 0.5) x 35% Use Limit.

<sup>2</sup> LBS of Forage Consumed = # CYL x 800lbs./month x 12. A 35% use limit with variable stocking maintains herd consuming about 2/3 of the useable forage (not total production) during different years of production to leave a reserve for unexpected changes.

year’s growth on key perennial grass species and assure that the physiological requirements of plant growth, rest, and reproduction are met for the following key species:

*Perennial Grasses:*

- Plains Lovegrass (ERIN)
- Sideoats Grama (BOCU)
- Cane Beardgrass (BOBA3)
- Vine Mesquite (PAOB)
- Blue Grama (BOGR)**
- Black Grama (BOER4)
- Hairy Grama (BOH12)
- Sprucetop Grama (BOCH)
- Plains Bristlegrass (SELE2MA)
- Wooly Bunchgrass (ELBA)
- Green Sprangletop (LEDU)
- Arizona Cottontop (DICA8)
- Crinkleawn (TRMO)
- Bush Muhly (MUPO2)
- Prairie Junegrass (KOCR)

The maximum number of cattle authorized would need to be within the utilization limit of 30 to 40 % in a favorable, normal, or unfavorable years. The use will be based on the weight of the current years production on the primary forage species identified in key study areas (at a minimum the permanent

study sites already established). BLM will attempt to identify the utilization patterns across the entire unit or area being used. Use would be measured about the time cattle are moved from the unit or when the current use level is felt to be near that desired limit. The guidelines for identifying the key monitoring areas would be based on the size and location of the unit being used (usually only a portion of a single pasture is used based on which primary waters are being used and the topography and season of use the unit is being grazed). There may be several units of usability within a pasture. Generally, these units average 250 to 500 acres and are used by the main herd for a period of a couple of weeks. Normally, use will be measured one-third to one-half mile from the primary water. The Grazed-Class photo guide method as identified by the University of Arizona will be used and a photograph taken to “show” the conditions measured. When the desired use levels are reached, cattle will be moved to the next unit.

4. The biological planning process would be expanded and formalized on the Empire-Cienega allotment and similar biological planning processes would begin for the other

allotments. The biological planning processes will have the following structure:

- Biological Planning Process Structure- The key to the variable stocking rate and flexible pasture rotation management approach is: (1) to have a variety of options for any planned grazing rotations, and (2) to be able to quickly change from the plan when range conditions or livestock needs differ from that expected.

**Under the Biological Planning Process, the Biological Planning Team helps the BLM review the monitoring data and provides input into proposed actions. The BLM Field Manager will make any necessary administrative decisions relating to the grazing program after review of existing data and after consultation and coordination with the Biological Planning Team and other interested agencies and public. The BLM will explore having the Tucson Field Manager request that the Biological Planning Team be established as a separate Rangeland Resource Team (RRT) operating under the auspices of the Arizona Resource Advisory Council (RAC) as provided for in 43 CFR 4100.**

**The Biological Planning Team would establish subcommittees as needed to address specific issues that might come up. Standing subcommittees would include a technical monitoring subcommittee to oversee the selection, collection, and analysis of monitoring data for input into the Biological Planning process and a recreation subcommittee to work on recreation related issues.**

- Components Participants--The Biological Planning team consists of a balance between resource managers, resource users, and those concerned with the resource's proper management.

Participants include representatives of the following:

- a. Land ownership (BLM, Arizona State Land Department, U.S. Forest Service, Audubon Society, private owners, and the Natural Resources Conservation Service).
  - b. Permitted uses (grazing lessees and recreation groups).
  - c. Research efforts (USDA Agricultural Research Service, University of Arizona, and Arizona State University).
  - d. Wildlife management needs and concerns (Arizona Game and Fish Department., and the U.S. Fish and Wildlife Service).
  - e. Environmental interests and public concerns.
- Actions--The team will meet at least twice a year (in March or April before the spring growing season and in September following the monsoon rains) to do the following:
    - a. Determine the current health and trend of the resource.
    - b. Evaluate monitoring data:
      - Precipitation
      - Rangeland ecological site (range) condition
      - Riparian and aquatic condition
      - Vegetation trends
      - Vegetation utilization
      - Soil cover
      - Wildlife populations and habitats
      - Livestock pasture use records
      - Livestock pasture recovery (new production)
      - Recreation post-use reports

## Chapter 2: Part B - Management Actions

- c. Evaluate proposed grazing and recreation actions in light of the objectives in this plan and current resource conditions or concerns.
- d. Recommend decisions to management on the following:
  - Annually authorize livestock grazing (conditions incorporated in grazing bill on numbers, pasture and water use, and rotation).
  - Change recreation authorizations or site uses.
5. The interim grazing plan for the Empire-Cienega allotment (BLM 1995) and the Coordinated Grazing Management Plan for the Empirita allotment would be modified to incorporate the goals, objectives, and actions in this plan. BLM would develop grazing management plans for the Rose Tree, Vera Earl, and Empire Mountains allotments.
6. BLM would develop more exclosures on allotments and monitor these non-grazed lands to determine the effects of grazing and rest on habitats and would authorize livestock grazing in these riparian pastures and exclosures **only at designated livestock crossing lanes and watering areas** or to meet a resource objective.

### **Empire-Cienega Allotment (#6090)-- Alternative 2 Proposed Management**

#### Summary of RMP-Level Proposal

Under Alternative 2, BLM would allocate **up to 8,448 AUMs of** livestock forage on **about 34,365 acres** of public land within the Empire-Cienega allotment (# 6090) and would continue to sublease livestock grazing on the 37,462 acres of State Trust Lands leased to BLM. **The actual number of AUMs of forage used annually would vary due to the flexible stocking in association with the Biological Planning Process described in the summary of Empire-Cienega Grazing**

**Management below.** About 2,319 acres (6%) of the BLM lands would be excluded from livestock grazing as vegetation study areas. **The exact number of excluded acres may vary depending on the number, size, and location of study exclosures which will be developed to help evaluate the effectiveness of grazing management.**

#### Activity Plan Proposal

##### **Livestock Management Actions**

Under Alternative 2, BLM would manage the Empire-Cienega Planning Area almost the same as it does now--a variable stocking rate with flexible livestock rotation-selective rest-rotation strategy. The main difference is that no livestock numbers would be established through a long-term lease agreement. Numbers would be established annually in response to rangeland health and through the Biological Planning Process. In addition, the proposed management would exclude more acreage from livestock grazing and would emphasize monitoring both grazed and non-grazed lands to determine the effects of grazing and rest on habitats. The biological planning process would still be the key. BLM would annually allocate livestock forage in response to the health of the resource, as determined by the assessment and evaluation of the monitoring data by the Biological Planning Team.

#### Summary of Empire-Cienega Grazing Management

1. Establish a formal process through the Biological Planning Team to determine the annual authorized use (which has averaged 1,037 cattle year-long (range of 662-1436) on the entire allotment at 49% public land use). Licensed use would be based on the number of cattle year-long on the entire allotment at 48% BLM public land use.
2. Modify the biological planning process as described above. Expand the process to include wildlife, grazing, and recreation issues. Modify the current interim grazing management plan to incorporate these changes.

3. Modify the current interim grazing management plan to incorporate flexible stocking rates determined annually by an assessment of range conditions and biological monitoring through the modified biological planning process. Alternative 2 would also develop the range improvement projects proposed for Alternative 1. **Additional range improvements may be proposed and constructed in the future based on results of ecological monitoring and/or livestock management needs.**
  - . Rotate use of crossing lanes and move cattle through them within 21 days.P
  - . Phase out water gaps in areas where adjacent upland waters are developed **(Map 2-26A).**
  - . Inspect and maintain riparian enclosure fences at least **twice once** annually **just prior to use of lands adjacent to the exclosures.**
  - . Locate all new repressos (i.e., earthen stock ponds) to minimize the likelihood of floods or humans moving exotic fish and bullfrogs into topminnow habitat.
  - . Use repressos only when required to water cattle and allow repressos to dry when no longer needed to water cattle. Drain repressos if they do not dry annually. **The BLM would be responsible for any required draining of repressos not related to the livestock operation.**
  - . Monitor the fish community and habitat, including crossing lanes, grazed riparian zones and repressos to document the level of incidental take and to check for introduction of exotic fish and bullfrog.
4. Modify the current interim grazing management plan to reduce utilization to 30-40% of current year's growth on key perennial grasses as described in the Alternative 2 summary.
5. Modify the current interim grazing plan to establish study exclosures on the 2,319 acres of public lands not allocated to livestock grazing. Monitor these non-grazed lands to determine the effects of grazing and rest on habitats.
6. Continue to implement the following measures to protect populations of Gila topminnow and topminnow habitat from grazing impacts:
  - . Limit livestock use in riparian areas of Cienega Creek, Mattie Canyon, and Empire Gulch with perennial water to the crossing lanes and watering areas listed in Table 2-25 and areas where BLM, through the biological planning process, determines a need to use livestock grazing as a management tool to meet a riparian or aquatic-related resource objective.
  - h. Develop mitigation plans in coordination with the Fish and Wildlife Service for range improvements and vegetation treatments which may harm the topminnow or its habitat.
7. Continue to implement the following measures to protect the Southwestern willow flycatcher and its habitat from grazing impacts:

- . Exclude livestock grazing from occupied or unsurveyed, suitable habitat during the Southwestern willow flycatcher breeding season (April 1-September 1) with the exception of crossing lanes.
  - . Do not authorize livestock management activities, including development of range improvements, in the riparian zone of unsurveyed, suitable or occupied willow flycatcher habitat during the willow flycatcher breeding season.
  - . Locate any new livestock management facilities likely to attract and support cowbirds more than five miles from occupied, suitable, or potential flycatcher habitat, unless such facilities are crucial to protecting riparian habitat, and cowbird trapping is implemented to counteract the effect of the facility.
8. Adjust livestock grazing rotation and utilization and develop more fencing, as needed, to meet watershed cover required in the upland vegetation objective.
9. Adjust livestock grazing rotation and utilization and develop more fencing, as needed, to leave enough cover after the summer livestock rotation to meet cover needs for pronghorn fawning as described in the pronghorn habitat objective (Upland Wildlife Habitat Sub-Objective B).
10. Adjust grazing rotation by developing a North-South Hilton pasture fence to ensure adequate cover for grassland sparrows as defined in the grassland sparrow sub-objective (Upland Wildlife Habitat Sub-Objective A).

**Empirita Allotment (#6210)--  
Alternative 2 Proposed Management**

Summary of RMP Proposal

Under Alternative 2, BLM would allocate **288 AUMs of** livestock grazing forage on 1,000 of the 1,520 acres of public lands and continue to

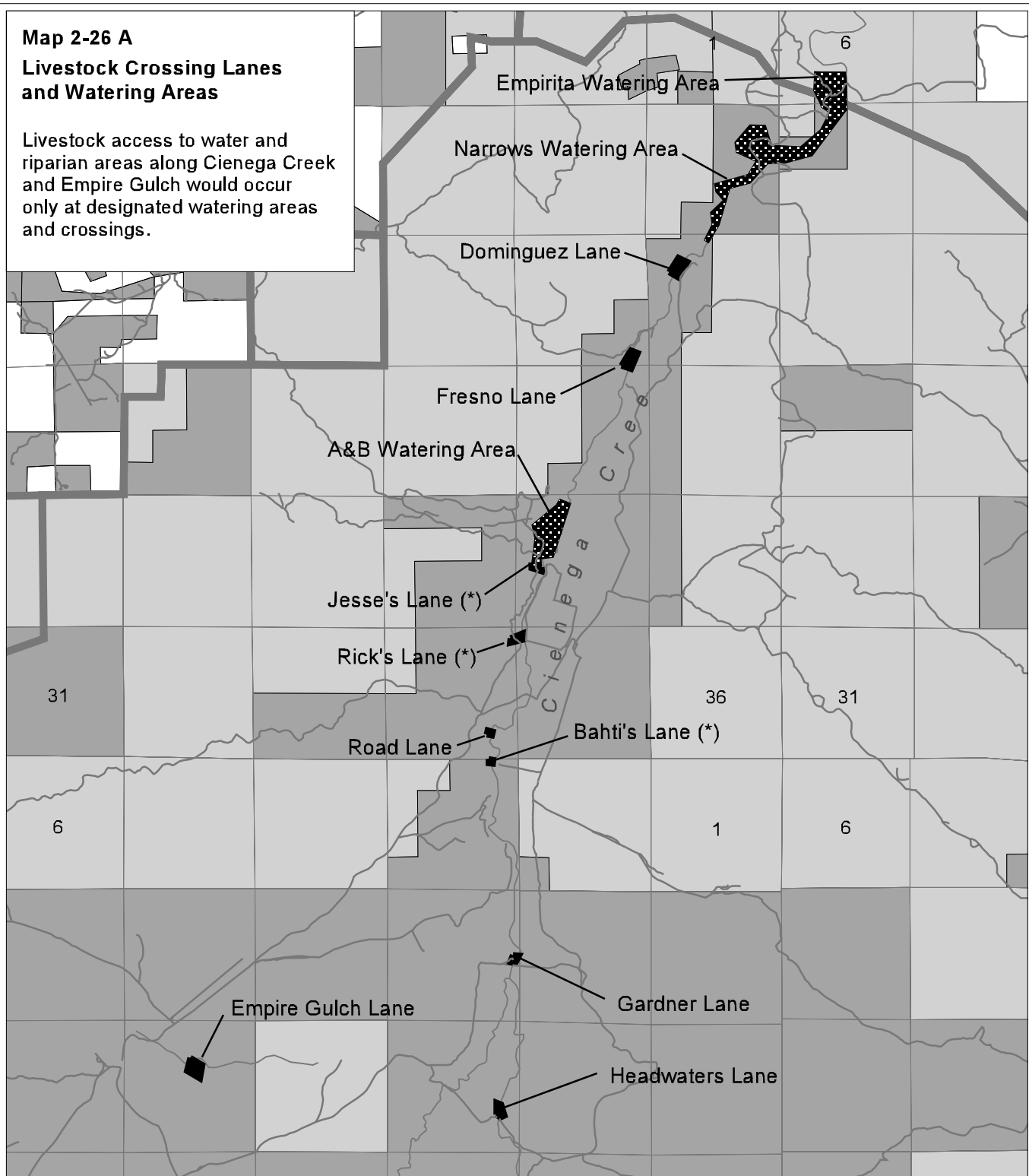
**Table 2-25  
Livestock Crossing Lanes and Watering Areas, Empire-Cienega Allotment**

<b>Crossing Lane</b>	<b>Legal Location<sup>1</sup></b>	<b>Type</b>	<b>Pasture</b>
<b>Upper Empire Gulch</b>	<b>T.18S, R.17E, Sec. 17</b>	<b>Crossing Lane</b>	<b>Empire/Orchard</b>
Headwaters	T.19S, R.17E, Sec. 15	<b>Crossing Lane</b>	5 Wire, Hilton Sacaton
Gardner	T. 19S, R. 17E, Sec. 10	<b>Crossing Lane</b>	500 Acre, 5 Wire
EC-900 <b>Old Road</b> Crossing (Hardened)	T. 18S, R. 17E, <b>Sec. 35</b>	<b>Crossing Lane</b>	Mac's Sacaton, North
<b>Sam's</b>	<b>T. 18S, R. 17E, Sec. 26</b>		North, Ag. Fields
<b>49 Lane (A &amp; B Gaps)</b>	T. 18S, R. 17E, <b>Sec. 2</b>	<b>Watering Area/Crossing Area</b>	Mac's Sacaton, Lower 49
Fresno	T. 18S, R. 17E, Sec. 23	<b>Crossing Lane</b>	Fresno, 49, Rockhouse
Dominguez	T. 18S, R. 17E, Sec. 13	<b>Crossing Lane</b>	Rockhouse, Fresno
<b>Dominguez -Narrows</b>	<b>T.18S, R.17E, Sec.12 &amp; 13</b> <b>T.18S, R.18E, Sec. 6 &amp; 7</b>	<b>Watering Area - Winter Use Only</b>	Rockhouse, A3, Apache

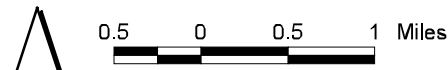
<sup>1</sup>Crossing lane locations may be adjusted in the future based on ecological monitoring or if needed to improve livestock management.

**Map 2-26 A**  
**Livestock Crossing Lanes**  
**and Watering Areas**

Livestock access to water and riparian areas along Cienega Creek and Empire Gulch would occur only at designated watering areas and crossings.



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Livestock Watering Area
- Livestock Crossing Lane
- Existing Road
- \* Crossing lane eliminated under Alternatives 2 and 3.
- Grazing Allotment Boundary

## Chapter 2: Part B - Management Actions

sublease the 23,468 acres of State Trust lands under grazing lease (05-437) to the Parsons Company. **The actual number of AUMs of forage used annually would vary due to the flexible stocking in association with the Biological Planning Process described in the** summary of Empire-Cienega Grazing Management above. A total of 520 acres (34%) of public lands within the Empirita allotment (#6210) would be excluded from grazing to study the effects of grazing. **The exact number of excluded acres may vary depending on the number, size, and location of study exclosures which will be developed to help evaluate the effectiveness of grazing management.**

### Summary of Empirita Grazing Management

1. Change the grazing strategy to a variable stocking rate with a flexible livestock rotation-selective rest-rotation strategy.
  2. Establish a formal process through the Biological Planning Team to determine the annual authorized use (that has averaged 80 to 337 cattle year-long on the entire allotment at 3% public land use).
  3. Implement the biological planning process on the Empirita allotment as described above. Allocate livestock forage yearly in response to the health and productivity of the resource, as determined by the Biological Planning Team's evaluation of the monitoring data. This stocking rate would be determined annually by assessing range conditions and biological monitoring through the biological planning process. Flexible rotation is based on current resource conditions and objectives and uses the biological planning process to provide input into seasonal decision making.
  4. Modify the grazing management plan to incorporate flexible stocking rates, the biological planning process, and the building of fencing and water developments to develop riparian pastures at the Narrows and around Nogales Spring. The other range improvements proposed for Alternative 1 would also be developed under Alternative 2. **Additional range improvements may be proposed and constructed in the future based on results of ecological monitoring and/or livestock management needs.**
5. Modify the grazing management plan to reduce utilization to 30-40% of current year's growth on key perennial grass species as described in the Alternative 2 summary above.
  6. Establish study exclosures on the 520 acres of public lands not allocated to livestock grazing. Monitor these non-grazed lands to determine the effects of grazing and rest on habitats.
  7. Implement the following measures to protect Gila topminnow and topminnow habitat from grazing impacts:
    - a. Limit livestock use in riparian areas of Cienega Creek and Nogales Springs with perennial water to the Narrows crossing lane and watering area (T. 18S, R. 18E, Sec. 3) and areas where BLM, through the biological planning process, determines a need to use livestock grazing as a management tool to meet a riparian or aquatic-related resource objective.
    - b. Rotate use of crossing lanes and move cattle through them within 21 days.
    - c. Phase out water gaps in areas where adjacent upland waters are developed.
    - d. Inspect and maintain riparian exclosure fences at least **twice once** annually **just prior to use of lands adjacent to the exclosures.**
    - e. Locate all new repressos (i.e., earthen stock ponds) to minimize the likelihood of floods or humans moving exotic fish and bullfrogs into topminnow habitat.

- f. Use repressos only when required to water cattle and allow repressos to dry when no longer needed to water cattle. Drain repressos if they do not dry annually. **The BLM would be responsible for any required draining of repressos not related to the livestock operation.**
  - g. Monitor the fish community and habitat including crossing lanes, grazed riparian zones, and repressos to document the level of incidental take and to check for introduction of exotic fish and bullfrogs.
  - h. Develop mitigation plans in coordination with the Fish and Wildlife Service for range improvements and vegetation treatments that may harm the topminnow or its habitat.
8. Continue to implement the following measures to protect the Southwestern willow flycatcher and its habitat from grazing impacts:
- a. Exclude livestock grazing from occupied or unsurveyed, suitable habitat during the Southwestern willow flycatcher breeding season (April 1-September 1), except for crossing lanes.
  - b. Do not authorize livestock management activities, including development of range improvements, in the riparian zone of unsurveyed, suitable or occupied willow flycatcher habitat during the willow flycatcher breeding season.
  - c. Locate any new livestock management facilities likely to attract and support cowbirds more than five miles from occupied, suitable, or potential flycatcher habitat unless such facilities are crucial to protecting riparian habitat and cowbird trapping is implemented to counteract the effect of the facility.

**Rose Tree Allotment (#6043)--  
Alternative 2 Proposed Management**

Summary of RMP-Level Proposal

Under Alternative 2, BLM would allocate **1104 AUMS** of livestock grazing forage on 3,550 acres of the 3,950 acres of public lands within the Rose Tree allotment (#6043) and exclude 400 acres (7%) from livestock grazing to study the effects of grazing. The allotment also includes 3,719 acres of State Trust lands and 1,200 acres of private lands, which the livestock operator would continue to use for grazing. **The actual number of AUMs of forage used annually would vary due to the flexible stocking in association with the Biological Planning Process described in the summary of Empire-Cienega Grazing Management above. The exact number of excluded acres may vary depending on the number, size, and location of study exclosures which will be developed to help evaluate the effectiveness of grazing management.**

Summary of Rose Tree Grazing Management

1. Change the grazing strategy to a variable stocking rate with a flexible livestock rotation-selective rest-rotation strategy.
2. Establish a formal process through the Biological Planning Team to determine the annual authorized use (that has varied from 100-200 animal units on a year-long basis). Licensed use would be based on the number of cattle year-long on the entire allotment at 42% BLM public land use.
3. Implement the biological planning process on the Rose Tree allotment as described above. Allocate livestock forage yearly in response to the health and productivity of the resource, as determined by the Biological Planning Team's evaluation of the monitoring data. The team would determine stocking rates annually by assessing range conditions and biological monitoring through the biological planning process. Flexible rotation is based on current resource conditions and objectives



## Chapter 2: Part B - Management Actions

and uses the biological planning process to provide input into seasonal decision making.

4. Conduct an ecological site inventory to evaluate current vegetation conditions to compare to the upland vegetation objective.
5. Develop a grazing management plan that incorporates flexible stocking rates, the biological planning process, and any other range improvements needed to meet resource objectives.
6. Reduce the utilization limit to 30-40% of current year's growth on key perennial grass species as described in the Alternative 2 summary above.
7. Adjust livestock grazing rotation and utilization and develop more fencing as needed to achieve watershed cover required in the upland vegetation objective.
8. Adjust livestock grazing rotation and utilization and develop more fencing, as needed, to leave enough cover after the summer livestock rotation to meet cover needs for pronghorn fawning as described in the pronghorn habitat objective (Upland Wildlife Habitat Sub-Objective B) and to ensure adequate cover for grassland sparrows as defined in the grassland sparrow sub-objective (Upland Wildlife Habitat Sub-Objective A).
9. Establish study exclosures on the 400 acres of public lands not allocated to livestock grazing. Monitor these non-grazed lands to determine the effects of grazing and rest on habitats.

### **Vera Earl Allotment (#6129)-- Alternative 2 Proposed Management**

#### Summary of RMP-Level Proposal

Under Alternative 2, BLM would allocate **324 AUMs of** livestock grazing forage on 1,240 acres of the 1,440 acres of public lands on the

Vera Earl allotment (#6129) and exclude 200 acres (14%) from livestock grazing. **The actual number of AUMs of forage used annually would vary due to the flexible stocking in association with the Biological Planning Process described in the summary of Empire-Cienega Grazing Management above. The exact number of excluded acres may vary depending on the number, size, and location of study exclosures which will be developed to help evaluate the effectiveness of grazing management.**

#### Summary of Vera Earl Grazing Management

1. Change the grazing strategy to a variable stocking rate with a flexible livestock rotation-selective rest-rotation strategy.
2. Establish a formal process through the Biological Planning Team to determine the annual authorized use (that has been 27 animal units on a year-long basis on the BLM portion of the allotment only-100% BLM). Licensed use would be based on the number of cattle year-long on the entire allotment at 5% BLM public land use.
3. If the operator chose, licensed use could also be based on the number of cattle year-long on the entire allotment at 10% BLM public land use. The current stocking rate is 27 CYL on the BLM portion of the allotment (100% public land use). On the entire allotment, the authorized use is about 282 CYL at 10% public land use = 338 AUMs. The other lands include USFS and about 6,000 acres of private lands owned by the estate of Bettie A. Beck.
4. Implement the biological planning process on the Vera Earl allotment as described above. Allocate livestock forage yearly in response to the health and productivity of the resource, as determined by the Biological Planning Team's evaluation of the monitoring data. The team would determine this stocking rate by assessing range conditions and biological monitoring through the biological planning process.

The flexible rotation is based on current resource conditions and objectives and uses the biological planning process to provide input into seasonal decision making.

5. Conduct an ecological site inventory to evaluate current vegetation conditions to compare to the upland vegetation objective.
6. Develop a grazing management plan that incorporates flexible stocking rates, the biological planning process, and any other range improvements needed to meet resource objectives.
7. Reduce the utilization limit to 30-40% of current year's growth on key perennial grass species as described in the Alternative 2 summary above.
8. Adjust livestock grazing rotation and utilization and develop more fencing, as needed, to achieve watershed cover required by the upland vegetation objective.
9. Adjust livestock grazing rotation and utilization and develop more fencing, as needed, to leave enough cover after the summer livestock rotation to meet cover needs for pronghorn fawning as described in the pronghorn habitat objective (Upland Wildlife Habitat Sub-Objective B) and to ensure adequate cover for grassland sparrows as defined in the grassland sparrow sub-objective (Upland Wildlife Habitat Sub-Objective A).
10. Establish study exclosures on the 200 acres of public lands not allocated to livestock grazing. Monitor these non-grazed lands to determine the effects of grazing and rest on habitats.

#### **Empire Mountains Allotment-- Alternative 2 Proposed Management**

##### Summary of RMP-Level Proposal

Under Alternative 2, BLM would allocate **360 AUMs** of livestock grazing forage on 2,000 acres of the 2,480 acres of public lands in the

Empire Mountains and include 480 acres in livestock exclosures. A new grazing allotment would be created. The grazing allotment could also include about 4,000 acres of private lands leased by the grazing operator for grazing.

**The actual number of AUMs of forage used annually would vary due to the flexible stocking in association with the Biological Planning Process described in the summary of Empire-Cienega Grazing Management above. The exact number of excluded acres may vary depending on the number, size, and location of study exclosures which will be developed to help evaluate the effectiveness of grazing management. The allotment would not be activated until the prerequisites described in the livestock management actions section below are completed. If the allotment is not activated within five years of the date of the Record of Decision on this plan, then the BLM would reassess the situation and consider reallocating the forage to watershed and other uses.**

##### Summary of Empire Mountains Grazing Management

**Prior to authorization of any active livestock use on the new Empire Mountains allotment, the grazing lessee would be required to submit a proposed Allotment Management Plan developed with full cooperation of the private land owners within the allotment boundary. The plan must include necessary water and pasture development to provide adequate yearly rest for rangeland health. The plan must also include executed leases for grazing use of private lands and easements for fences, waters, and livestock ingress and egress. An economic analysis would be required showing sources and time frames for funding of the necessary infrastructure. An environmental analysis and biological assessment on the plan would also be required including completion of an ecological site inventory. The completed plan would be reviewed by the biological planning team (or Rangeland Resource Team), other interested public, and approved by the BLM. The following steps must be completed before the allotment can be activated:**

## Chapter 2: Part B - Management Actions

1. Conduct an ecological site inventory to evaluate current vegetation conditions to compare to the upland vegetation objective and to help establish an initial stocking rate.
2. Develop a community-based grazing management plan that incorporates flexible stocking rates and rotation, the biological planning process, and any range improvements needed to meet resource objectives and manage livestock.

**Secure necessary executed leases for grazing use of private lands and easements for fences, waters, and livestock ingress and egress.**

**Complete necessary economic, environmental analysis and biological assessment.**

- . Build any needed range improvements, **including water and pasture development**, and complete the plan with community approval before stocking any livestock on allotment.
- . Establish a Biological Planning Team and a formal process through this team to determine annual authorized use.
- . Establish a utilization limit of 30-40% of current year's growth on key perennial grass species as described in the Alternative 2 summary above.
- . Establish study exclosures on the 400 acres of public land not allocated to livestock grazing. Monitor these non-grazed lands to determine the effects of grazing and rest on habitats.

### **Recreation Management Actions**

#### **Non-Motorized Trails**

Under Alternative 2, designation of an additional non-motorized loop trail is proposed in North and Oak Tree Canyons (Map 2-27). The trail begins and ends at the Air Strip day

use area. The proposed trail route crosses about three miles of public land and also crosses several miles of State Trust and Forest Service lands. The route for the return segment of the trail (about 1.5 miles) will be coordinated with the route for the Oak Tree Canyon portion of the Arizona Trail so as not to duplicate trails in this area. For the trail to be implemented, a right-of-way must be obtained from the Arizona State Land Department and approval for the trail location and development on Forest Service lands would also need to be obtained. ~~The Southern Arizona Mountain Bike Association (SAMBA) proposed the route, and has expressed interest in pursuing the right-of-way and necessary approvals for development.~~

#### **Management within Recreation Zones**

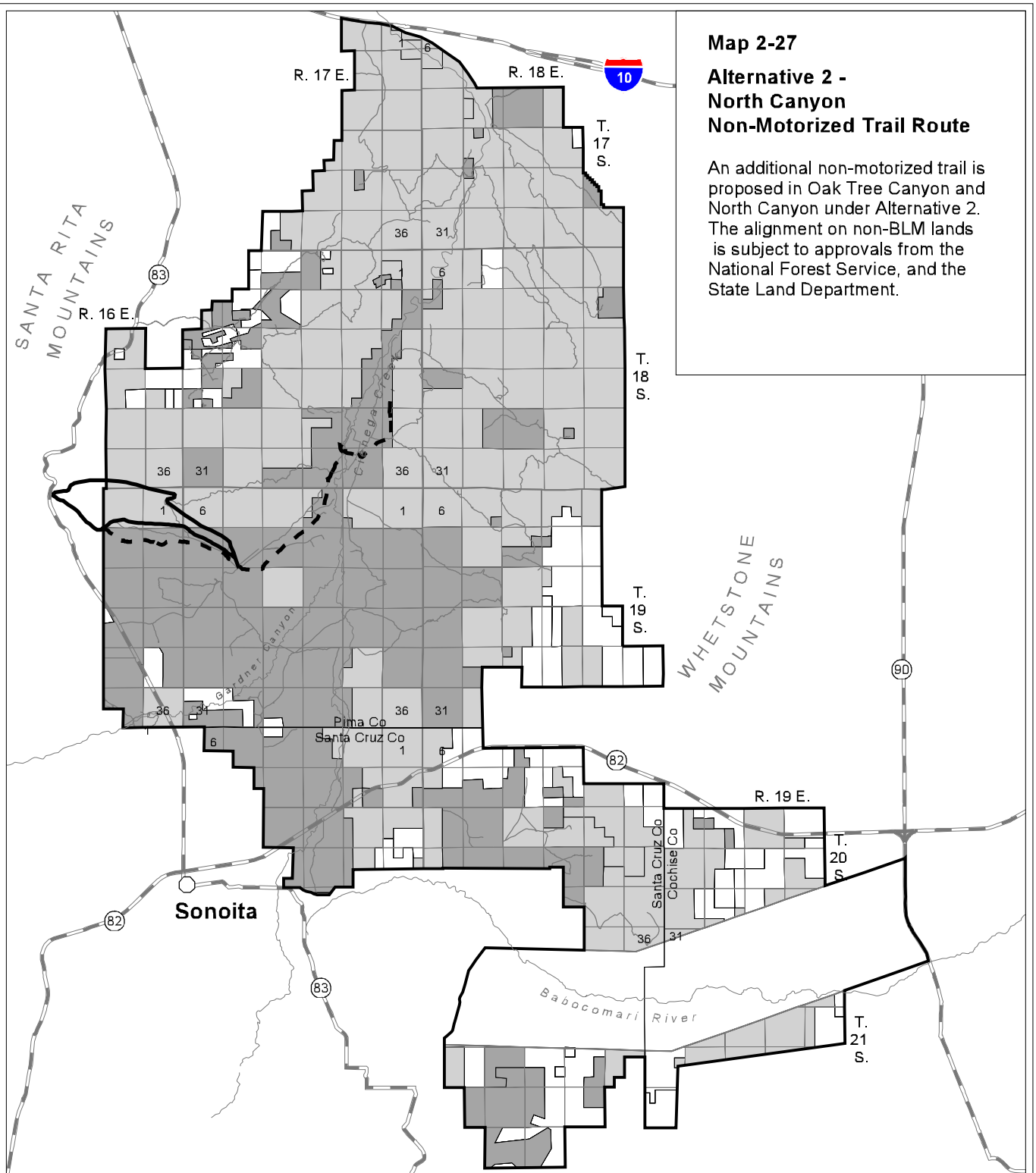
Managing visitor use impacts within recreation zones is an important part of maintaining the quality of the desired recreation opportunity settings included in the resource management plan (RMP) ~~level~~ proposals. Table 2-26 summarizes the management prescriptions for each recreation zone (See Maps 2-7, 2-14, and 2-19). BLM would apply these prescriptions, regardless of the different zone configurations under different alternatives. In addition to these prescriptions, BLM is proposing a step-down approach to managing visitor use impacts.

The first step would be to begin or increase visitor awareness or education. This more light-handed approach may in many instances be enough to reverse downward trends in resource conditions, including the decline in quality of recreational settings. Visitor education would incorporate existing national programs such as Leave No Trace and Tread Lightly. An important part of the education and awareness step would be to develop partnerships with user groups to help with education and visitor awareness. If education is unsuccessful, BLM might apply more heavy-handed approaches to reverse downward trends. Such approaches might include restrictions and regulations. BLM could also use partnerships to help with monitoring and rehabilitation.

**Map 2-27**

**Alternative 2 -  
North Canyon  
Non-Motorized Trail Route**

An additional non-motorized trail is proposed in Oak Tree Canyon and North Canyon under Alternative 2. The alignment on non-BLM lands is subject to approvals from the National Forest Service, and the State Land Department.



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Existing Road
- - - Arizona Trail Route
- North Canyon Trail Route

April 2002

**Table 2-26  
Recreation Management Zones, Empire-Cienega Planning Area**

<b>Factors Influencing Recreation Experience Opportunities</b>	<b>ZONE 0 Rural</b>	<b>ZONE 1 Roaded Natural</b>	<b>ZONE 2 Natural</b>	<b>ZONE 3 Backcountry Semi-Primitive</b>	<b>ZONE 4 Primitive Wilderness</b>
<b>Zone Descriptions</b>	<b>Zone 0</b> consists of the developed communities in the Sonoita Valley offering small-town amenities and activities.	<b>Zone 1</b> offers easy access with some interpretive and educational facilities. It generally consists of day use with no public camping. Motorized traffic is directed to use designated parking, pullouts, and loop drive.  <b>Zone Highlights:</b> * Sightseeing drive * High visitor concentration * No camping	<b>Zone 2</b> offers moderate access with infrequent road maintenance and designated camping, parking, and pullouts  <b>Zone Highlights:</b> * Sightseeing drive * Medium visitor concentration * Designated camping	<b>Zone 3</b> offers a low concentration of visitors and predominantly natural environment. Minimum on-site controls are present, but subtle. Zone has limited signage and dispersed recreation opportunities.  <b>Zone Highlights:</b> *Low visitor concentration *Dispersed camping	<b>Zone 4</b> offers a high solitude experience with low interaction among visitors. Restrictions and controls not evident after entry (Santa Ritas and Whetstone (not BLM)).  <b>Zone Highlights:</b> * Low visitor concentration * Non-motorized travel * Dispersed backpack camping
1. Difficulty Rating	Elementary	Elementary	Easy	Difficult	Advanced
2. Vehicle Recommendations	▶ All types	▶ RV ▶ Sedan ▶ Van ▶ No clearance requirements ▶ Touring motorcycle ▶ Mountain bike ▶ Horse trailers	▶ Sedan (on selected roads during good weather) ▶ Sport utility vehicle ▶ Moderate clearance needed ▶ Touring motorcycle ▶ Mountain bike ▶ Horse trailers	▶ 2WD in most areas ▶ High clearance needed ▶ 4WD/ATV in some areas ▶ Enduro/dirt motorcycle ▶ Mountain bike ▶ Horse trailers	▶ Generally non-motorized ▶ 4WD/ATV in some areas (limited access) ▶ Dirt motorcycle (limited access) ▶ Mountain bike/limited access)

**Table 2-26, continued**  
**Recreation Management Zones, Empire-Cienega Planning Area**

<b>Factors Influencing Recreation Experience Opportunities</b>	<b>ZONE 0 Rural</b>	<b>ZONE 1 Roaded Natural</b>	<b>ZONE 2 Natural</b>	<b>ZONE 3 Backcountry Semi-Primitive</b>	<b>ZONE 4 Primitive Wilderness</b>
3. Primary Recreational Activities	<ul style="list-style-type: none"> <li>▶ Small town amenities</li> <li>▶ Sightseeing</li> <li>▶ Wine tasting</li> <li>▶ Scenic tours</li> <li>▶ Town activities</li> </ul>	<ul style="list-style-type: none"> <li>▶ Sightseeing</li> <li>▶ Visiting historic sites</li> <li>▶ Photography</li> <li>▶ Camping</li> <li>▶ Day use</li> </ul>	<ul style="list-style-type: none"> <li>▶ Sightseeing</li> <li>▶ Camping</li> <li>▶ Visiting historic sites</li> <li>▶ Viewing wildlife</li> <li>▶ Photography</li> <li>▶ Driving for pleasure</li> <li>▶ Picnicking</li> <li>▶ Hunting</li> <li>▶ Equestrian activities</li> <li>▶ Mountain biking</li> </ul>	<ul style="list-style-type: none"> <li>▶ Sightseeing</li> <li>▶ Camping</li> <li>▶ Visiting historic sites</li> <li>▶ Viewing wildlife</li> <li>▶ Photography</li> <li>▶ Driving for pleasure</li> <li>▶ Picnicking</li> <li>▶ Hunting</li> <li>▶ Hiking</li> <li>▶ Backpacking</li> <li>▶ Solitude</li> <li>▶ Equestrian activities</li> <li>▶ Mountain biking</li> </ul>	<ul style="list-style-type: none"> <li>▶ Sightseeing</li> <li>▶ Camping</li> <li>▶ Viewing wildlife</li> <li>▶ Photography</li> <li>▶ Hunting</li> <li>▶ Hiking</li> <li>▶ Backpacking</li> <li>▶ Solitude</li> <li>▶ Equestrian activities</li> </ul>
4. Time Investment	▶ 1 hour to ¾ day	▶ 1 hour to ½ day	▶ ½ day to 1 day	▶ 1 or more days	▶ 1 or more days
5. Degree of Solitude	▶ Low	▶ Low	▶ Moderate	▶ Excellent	▶ Outstanding
6. Map Reading Skills Needed	▶ Low	▶ Low	▶ Moderate	▶ Moderate/High	▶ High
7. Survival Skills Needed	▶ Little	▶ Little	▶ Some	▶ Moderate	▶ High
8. Likelihood of Getting Lost if Unprepared	▶ Little	▶ Little	▶ Slight	▶ Moderate	▶ High
9. Likelihood of Getting Help if Stranded	▶ Very High	▶ High	▶ Moderate	▶ Low	▶ Very Low
10. Probable Waiting Time for First Contact with Another Party	▶ Less than 30 minutes	▶ 30 minutes	▶ 30 minutes to 1 hour	▶ Several hours to several days	▶ Several hours to several days

**Table 2-26, continued**  
**Recreation Management Zones, Empire-Cienega Planning Area**

<b>Factors Influencing Recreation Experience Opportunities</b>	<b>ZONE 0 Rural</b>	<b>ZONE 1 Roaded Natural</b>	<b>ZONE 2 Natural</b>	<b>ZONE 3 Backcountry Semi-Primitive</b>	<b>ZONE 4 Primitive Wilderness</b>
11. Probable Waiting Time for Summoned Help to Arrive	▶ Less than 30 minutes	▶ 1 hour	▶ 2 hours	▶ 4-6 hours	▶ 6+ hours
12. Availability of Drinking Water	▶ Yes	▶ Yes	▶ No	▶ No	▶ No
13. Availability of Gasoline	▶ Yes	▶ No	▶ No	▶ No	▶ No
14. Accommodations (i.e. Motel, Hookups)	▶ Yes	▶ No	▶ No	▶ No	▶ No
15. Groceries/Eating Places	▶ Yes	▶ No	▶ No	▶ No	▶ No
16. Typical Road Type	▶ County maintained roads, paved.	▶ Improved gravel or dirt, frequent, moderate to high maintenance	▶ Improved gravel or dirt, infrequent, low maintenance	▶ Unmaintained or not present	▶ Unmaintained or not present
17. Range of Typical Road Types	▶ Good	▶ Good to muddy/impassable	▶ Good to muddy/impassable	▶ Fair to impassable	▶ No roads to very poor
18. Level of Informational, Directional, or Interpretive Signage	▶ Abundant	▶ Abundant	▶ Frequent	▶ Occasional	▶ Rare
19. Available BLM Informational Flyers, Brochures, etc.	▶ Some	▶ Abundant	▶ Some	▶ Few	▶ Rare
20. Visitor Centers, Interpretive Sites	▶ Some	▶ Yes	▶ Some	▶ No	▶ No

**Table 2-26, continued**  
**Recreation Management Zones, Empire-Cienega Planning Area**

<b>Factors Influencing Recreation Experience Opportunities</b>		<b>ZONE 0 Rural</b>	<b>ZONE 1 Roaded Natural</b>	<b>ZONE 2 Natural</b>	<b>ZONE 3 Backcountry Semi-Primitive</b>	<b>ZONE 4 Primitive Wilderness</b>
21.	Designated Picnic Areas	▶ Yes	▶ Yes	▶ Yes	▶ Yes	▶ No
22.	Designated Camping Areas	▶ Yes	▶ No	▶ Yes	▶ Yes	▶ No
23.	Dispersed Camping	▶ No	▶ No	▶ Yes	▶ Yes	▶ Yes
24.	Group Sites	▶ Yes	▶ Yes ▶ Seasonal	▶ Yes ▶ Seasonal	▶ Yes ▶ Seasonal	▶ No
25.	Designated Pullouts	▶ Yes	▶ Yes	▶ Few	▶ Few	▶ No
26.	Designate Speed Limits not to exceed 25 mph unless otherwise posted	▶ N/A	▶ Yes	▶ Yes	▶ Yes	▶ N/A
27.	Distance Allowed to Drive Vehicle Off Road to Park	▶ N/A	▶ Use pull outs only	▶ Use pull outs only	▶ No more than 25 feet	▶ N/A



### Management of Designated Recreation Sites

The following are general management prescriptions for each type of designated recreation site:

*(Common to Alternatives 2, 3, and 4)*

#### Designated Group Sites

Group sites are open for group use only on a reservation basis and under a special recreation permit. Group sites will generally *not* be open to use by individuals if not reserved by a group. BLM will determine the capacity of a group site and length of a single event at such a site, depending on the type of activity and resource concerns. Special stipulations will be attached to group activities at these sites through the special recreation permit process. BLM may seasonally or temporarily close group sites in response to resource conditions or other concerns. Any improvements or developments at the sites must conform to the overall management prescription for the zone in which the site occurs. Permit holders may bring in portable improvements, but must remove these at the close of the event. BLM would monitor impacts from group sites to determine if it needs to adjust the site management.

#### Designated Camp Areas

The designated camping areas would all have similar management prescriptions. These areas would be open for individual, but not group use (groups are defined as more than 29 people). The capacity of each camping area is expected to be less than 30 people. The most vehicles allowed on each individual site within the camping area would vary, depending on the site. Some sites would be limited to one vehicle. Other sites would be suitable for four to five vehicles. BLM would restrict the type of activity to camping and limit proposed development in each camping area to posting site numbers, erecting barriers of natural materials, if needed, and placing signs, which would be kept to a minimum. BLM proposes no other development and may seasonally close any of these sites in

response to resource conditions. The Road Canyon site would be closed during pronghorn fawning season (April-June).

The Oak Tree designated camping area has a few special stipulations. Proposed development of this area would consist of creating designated camping sites and parking spots that would prevent people from parking under oak trees. To deter campers from building fires under the oaks, BLM would establish fire rings away from the trees and erect vehicle barriers. BLM would also post educational signs to inform visitors about oak tree ecology and how parked cars and campfires harm the oaks.

#### Pullouts

Pullouts will consist of widened areas along roadways. They will be marked, if necessary, with signing and barriers of natural materials. The pullouts will be designed for vehicles to turn around in or for three to five vehicles to park in. Camping will not be permitted at pullouts.

#### Designated Recreation Sites

Under Alternative 2, BLM would establish three designated group sites (Maternity Well, Air Strip, and Agricultural Fields), four designated camp areas (Oak Tree, Cieneguita, Oil Well, and Road Canyon), and at least 11 pullouts (Map 2-28).

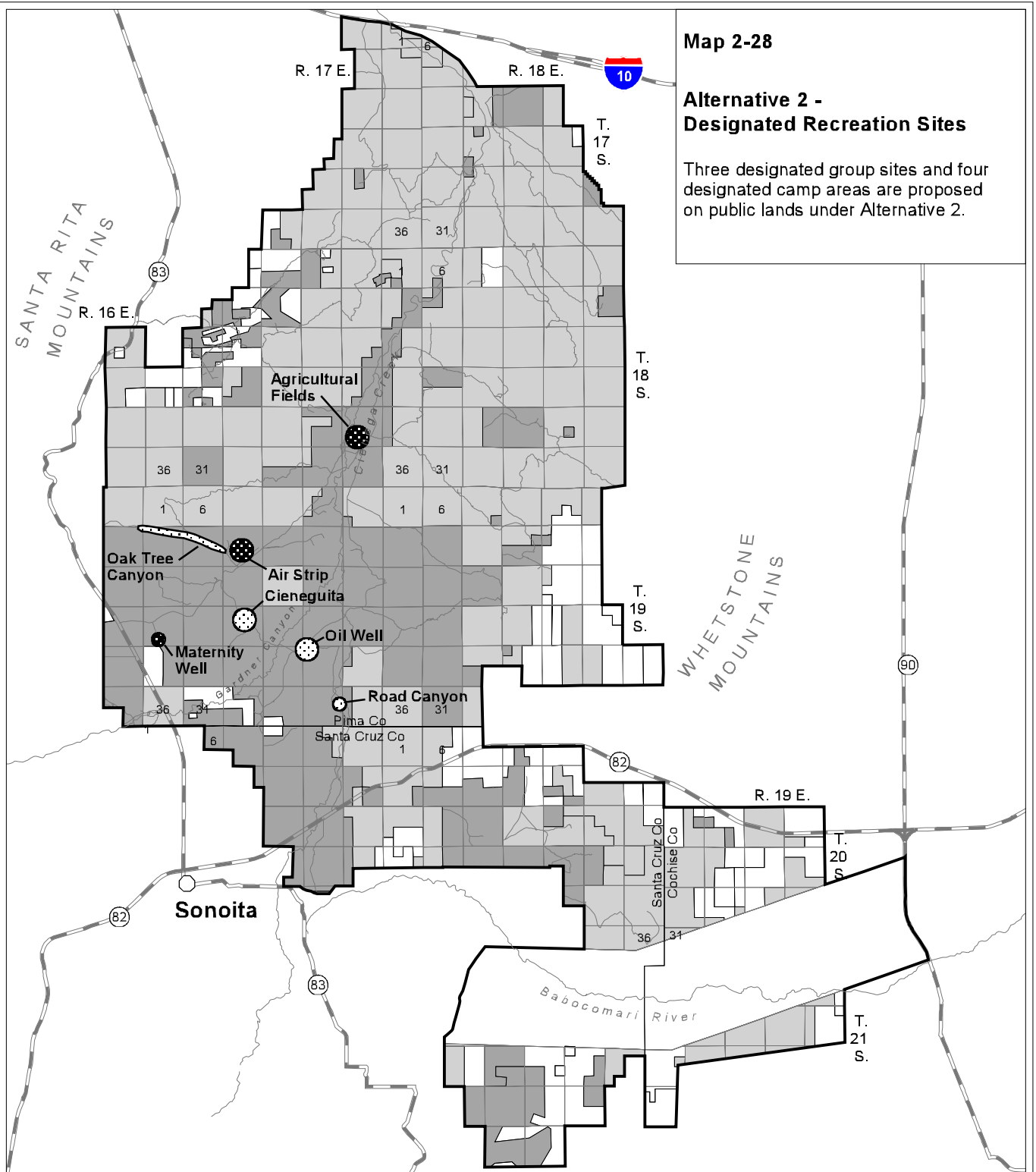
Table 2-27 compares the ~~activity plan proposals~~ **management actions** for recreation among the alternatives. Under Alternative 2, the capacity for the following group sites (general guidance only) are as follows:

- **Maternity Well:** 150 people or 30 vehicles with horse trailers or recreational vehicles.
- **Air Strip:** 500 people (combination of day use and group use areas). The vehicle capacity in the day use/trailhead area is 30 vehicles.

Map 2-28

**Alternative 2 - Designated Recreation Sites**

Three designated group sites and four designated camp areas are proposed on public lands under Alternative 2.



**FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN**



United States Department of the Interior  
 BUREAU OF LAND MANAGEMENT  
 TUCSON FIELD OFFICE

**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Designated Group Site
- ⊙ Designated Camp Area
- Road

**Table 2-27. Comparison of Recreation Alternative-- Activity Plan Level Management Actions  
Las Cienegas Resource Management Plan**

<b>Implementation Issue</b>	<b>Alternative 1 (No Action)</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
Designated Group Sites	None	3: Maternity Well, Air Strip, and Agricultural Fields	5: Maternity Well, Air Strip, Agricultural Fields, Road Canyon, and Hilton	1: Air Strip
<b>Group Site Capacity</b>	<b>Case-by-Case</b>	<b>Maternity Well = 150 people or 30 vehicles Air Strip = 500 people or 30 vehicles at trailhead Agricultural Fields = 500 people</b>	<b>Maternity Well = 150 people or 30 vehicles Air Strip = 500 people or 30 vehicles at trailhead Agricultural Fields = 1,000 people Road Canyon = 50 people Hilton = 50 people</b>	<b>Air Strip = 300 people</b>
Designated Camp Areas	None	4: Oak Tree, Cieneguita, Oil Well, and Road Canyon	5: Oak Tree, Agricultural Fields, Cieneguita, Oil Well, and Road Canyon	4: Oak Tree, Cieneguita, Oil Well, and Road Canyon
Day Use Areas	None	2: Empire Gulch, West 1/4 of Air Strip	2: Empire Gulch, West 1/4 of Air Strip	1: Empire Gulch
Designated Pullouts	None	2: (Kiosk and Ranch HQ) from Hwy. 83 East to Ranch HQ  4: From Ranch HQ South to Oil Well on South Road Loop Rd.  4: From Oil Well to Hwy. 82 Entrance on South Road Loop Rd.  1: On Curley Horse-Hummel Road	2: (Kiosk and Ranch HQ) from Hwy. 83 East to Ranch HQ  4: From Ranch HQ South to Oil Well on South Road Loop Rd.  4: From Oil Well to Hwy. 82 Entrance on South Road Loop Rd.  1: On Curley Horse-Hummel Road  3: From Ranch HQ to Agricultural Fields	2: (Kiosk and Ranch HQ) from Hwy. 83 East to Ranch HQ  4: From Ranch HQ South to Oil Well on South Road Loop Rd.  4: From Oil Well to Hwy. 82 Entrance on South Road Loop Rd.
Note: These are the minimum number of pullouts and approximate locations; others may be proposed and site locations may be adjusted after site reviews.				
Group Size (Requiring Special Recreation Permit <sup>1</sup> )	50 Vehicles	30 or More People	30 or More People	30 or More People

<sup>1</sup>Other conditions may warrant a special recreation permit, including commercial and competitive events.

- **Agricultural Fields:** 1,000 500 people.

Under Alternative 2, at the Maternity Well group site, BLM would move the parking area south of the existing corral to reduce visual impacts from the entrance road. BLM would also delineate a parking area with barriers of natural materials and, if needed, may harden the parking area with gravel or similar materials. If necessary, BLM might install a gate on this road to control access to the site. In addition, the water source might be moved so that camping in this area does not affect livestock or wildlife access to water. The Maternity Well group site would be open seasonally, generally, from October to April.

Under Alternative 2 the Air Strip site would consist of a combination group site and trailhead. About 75% of the site would be open for group use on a reservation basis but would not be open to individual use. About 33% of this group site would consist of an overflow area for larger group events. BLM would reclaim and re-vegetate the site as needed to minimize bare ground, reduce visual impacts, and create more desirable camping opportunities.

The remaining 25% at the site would serve as a day use area and as a trailhead and parking area for the Arizona Trail. Trail users could park overnight in this area, and other visitors could use the area in the day. BLM would delineate the day use and trailhead parking area with barriers made of natural materials. The parking area could be hardened with gravel or similar material if necessary. The Air Strip group site would be open year round with periodic closures to allow the area to recover from impacts as determined by monitoring.

Under Alternative 2, the northeast corner of the Agricultural Fields would be designated as a group site and would have no development except for water at the Field Well. This site is specified for group events lasting no longer than one week. The Agricultural Fields would be

open seasonally and could be closed, and numbers of users or length of events restricted due to environmental restoration.

#### **Designated Road Crossings**

Under Alternative 2, the route designations (Map 2-6) limit motorized vehicles to four crossings of Cienega Creek (only one across perennial section) and one crossing of Empire Gulch (only one across perennial section) (See Table 2-19A). There are two additional designated non-motorized crossings on Cienega Creek or Empire Gulch.

### **Alternative 3: Activity Plan Management Actions**

#### **Management Actions Common to Alternatives 2, 3, and 4**

See the first section of Alternative 2 above for Management Actions Common to Alternatives 2, 3, and 4 regarding: Upland Vegetation, Riparian, Fish and Wildlife, **Mineral Resources**, Cultural Resources, Access and Transportation, and Recreation Management Actions.

#### ***Cultural Resource Management Actions***

##### **Empire Ranch Headquarters**

Management under Alternative 3 would be the same as under Alternative 2.

##### **Cultural Properties Outside the Headquarters Area**

Management under Alternative 3 would be the same as under Alternative 2 except that under Alternative 3, Class III cultural resource surveys would be conducted on 94.2 89.0 miles of roads and trails by 2004 (**dependent on adequate funding**).

## Alternative 3 Livestock Grazing and Recreation Management Actions

### *Livestock Grazing Management Actions*

Alternative 3 takes the traditional land management agency approach to livestock grazing management. Each allotment has a fixed stocking rate based on a “conservative” number of cattle that the agencies believe could be run every year on the allotments on a sustained yield basis (Table 2-28). The livestock numbers would be established in the livestock leases by each agency. The initial stocking rate would be based on the cattle numbers recommended in the NRCS ecological site guides for ranges with a “fair” similarity to the historic climax plant communities on each allotment. BLM would have to recommend that the ASLD reduce the cattle numbers on the BLM held leases to achieve the numbers proposed under this alternative.

Under Alternative 3, the stocking rate would not vary with changes in vegetation production. Table 2-29 shows the total vegetation production in favorable, normal, and unfavorable years (based on rainfall) on all lands within each allotment. Also shown is the average amount of forage that livestock could consume on these lands under established maximum stocking rates. In unfavorable years a proportionally greater percentage of the available useable forage is consumed than in favorable years. The available useable forage is assumed to be 50% of the total vegetation produced multiplied by the 35% utilization rate on lands allocated for livestock grazing.

### *Highlights of Alternative 3 Livestock Grazing Management*

- Four livestock operators would continue to lease public lands in the planning area on four individual grazing allotments (Empire-Cienega, Empirita, Rose Tree, and Vera Earl). A livestock grazing allotment would be established in the Empire Mountains.

- Each allotment would implement a conservative set stocking rate with scheduled livestock rotations-next best pasture strategy.
- On each allotment the utilization limits would be adjusted downward from current levels as recommended by Holechek and others (1999). Like Alternative 2, Alternative 3 would implement utilization of 30-40% of current year’s growth on key perennial grasses and assure that the physiological requirements of plant growth, rest, and reproduction are met for the following key species:

#### *Perennial Grasses*

Plains Lovegrass (ERIN)  
Sideoats Grama (BOCU)  
Cane Beardgrass (BOBA3)  
Vine Mesquite (PAOB)  
**Blue Grama (BOGR)**  
Black Grama (BOER4)  
Hairy Grama (BOHI2)  
Sprucetop Grama (BOCH)  
Plains Bristlegrass (SELE2MA)  
Wooly Bunchgrass (ELBA)  
Green Sprangletop (LEDU)  
Arizona Cottontop (DICA8)  
Crinkleawn (TRMO)  
Bush Muhly (MUPO2)  
Prairie Junegrass (KOCR)

- BLM would eliminate the biological planning process on the Empire-Cienega allotment, and not apply similar biological planning processes to the other allotments. Proposed changes with which the livestock’s operator does not voluntarily comply would need to go through BLM’s grazing decision process, with the potential for hearings on and appeals of the proposed decisions. Change in livestock numbers on State Trust and privately owned or leased lands in the ranch operations would be outside BLM’s influence.

**Table 2-28**  
**Proposed Authorized Grazing Use Under Alternative 3**  
**Las Cienegas Resource Management Plan**

<b>Allotment</b>	<b>Total Acres Grazed</b>	<b>Total Cows</b>	<b>Total Production (Million-lbs.) (Normal Yr.)</b>	<b>BLM Acres Grazed</b>	<b>BLM Cows on BLM</b>	<b>BLM Acres Not Grazed</b>	<b>ASLD Acres</b>	<b>ASLD Cows on ASLD</b>	<b>Private Acres</b>	<b>Cows on Private Cows</b>
Empire	73,487	796	88.18	36,025	390	659	3,7462	406	0	0
Empirita	24,948	229	19.96	1,480	14	40	23,468	215	0	0
Rose Tree	8,869	96	10.64	3,950	43	0	3,719	40	1,200	13
Vera Earl	1,440	16	1.73	1,440	16	0	0	0	N/A	N/A
Empire Mountains	3,524	38	2.82	2,480	27	<del>2,480</del>	0	0	1,044	11
									Total Grazed 0	
<b>TOTAL:</b>	<b>107,704</b>	<b>1,175</b>	<b>123.33</b>	<b>43,895</b> <b>45,375</b>	<b>486</b> <b>490</b>	<b>699</b>	<b>64,649</b>	<b>661</b>	<b>2,244</b>	<b>24</b>

**Table 2-29**  
**Vegetation Production under Three Rainfall Regimes and Livestock Forage Consumption under**  
**Alternative 3 Livestock Management**  
**Las Cienegas Resource Management Plan**

	<b>Total Acres Grazed</b>	<b>Total Cows</b>	<b>Total Production Grazed Acres (Million-lbs.)</b>	<b>Production Consumed by Total Cows (Million-lbs.)</b>	<b>% Total Production Consumed</b>	<b>Available Useable<sup>1</sup> Forage (Million-lbs)</b>	<b>% Available Useable Forage Consumed<sup>2</sup></b>
Favorable Year	107,704	1,175	188.55	11.28	6	33.00	34
Normal Year	107,704	1,175	123.33	11.28	9	21.58	52
Unfavorable Year	107,704	1,175	82.75	11.28	14	14.48	78

<sup>1</sup> Useable Forage = (TOTAL PRODUCTION /2) x 35% Use Limit

<sup>2</sup> LBS of Forage Consumed = #CYL x 800lbs/month x 12. A 35% Use limit with variable stocking maintains herd consuming about 2/3 of the useable forage (not total production) during different years of production. Without variable stocking rate the vegetation reserve is consumed by the herd as production decreases.

**Empire-Cienega Allotment (#6090)--  
Alternative 3 Proposed Management**

Summary of RMP-Level Proposal

Under Alternative 3, BLM would allocate **4,680 AUMs** of livestock forage on 36,025 acres of the 36,684 acres of public land within the existing Empire-Cienega allotment (# 6090), and 659 acres would be excluded from livestock grazing.

Activity Plan Proposal

**Livestock Management Actions**

The proposed livestock grazing management for the Empire-Cienega allotment under Alternative 3 would change the grazing strategy to a fixed conservative stocking rate with scheduled livestock rotations-next best pasture strategy. This is the traditional agency approach.

Summary of Empire-Cienega Grazing Management

1. Establishes a conservative stocking rate (allowing for the dry years). The operator may run this number of cattle each year following a scheduled rotation that provides rest and deferments from livestock grazing. The stocking rate would be set at 796 cattle year-long (CYL) for the entire allotment (at 49% public land use) with scheduled rests and grazing deferments.
2. Eliminates the Biological Planning Team approach. BLM, the Arizona State Land Department, the grazing lessee, and other interested parties would monitor use levels and vegetation changes.
3. Modifies the grazing management plan to a fixed, conservative stocking rate. Range improvements proposed under Alternative 1 would be developed. **Additional range improvements may be proposed and constructed in the future based on results of ecological monitoring and/or livestock management needs.**

4. Reduces utilization to 30-40% of current year's growth on key perennial grass species as described in the Alternative 3 Livestock Grazing Management Actions above.
5. Continues to implement the following measures to protect populations of Gila topminnow and topminnow habitat from grazing impacts:
  - a. Limit livestock use in riparian areas of Cienega Creek, Mattie Canyon, and Empire Gulch with perennial water to the crossing lanes and watering areas listed in Table 2-25 **and shown on Map 2-26A** and areas where BLM determines a need to use livestock grazing as a management tool to meet a riparian or aquatic-related resource objective.
  - b. Rotate use of crossing lanes and move cattle through them within 21 days.
  - c. Phase out water gaps in areas where adjacent upland waters are developed.
  - d. Inspect and maintain riparian enclosure fences at least **twice once** annually **just prior to use of lands adjacent to the enclosures.**
  - e. Locate all new repressos (i.e., earthen stock ponds) to minimize the likelihood of floods or humans moving exotic fish and bullfrogs into topminnow habitat.
  - f. Use repressos only when required to water cattle and allow repressos to dry when no longer needed. Drain repressos if they do not dry annually. **The BLM would be responsible for any required draining of repressos not related to the livestock operation.**
  - g. Monitor the fish community and habitat, including crossing lanes, grazed riparian

zones, and repressos to document the level of incidental take and to check for introduction of exotic fish and bullfrogs.

- h. Develop mitigation plans in coordination with the Fish and Wildlife Service for range improvements and vegetation treatments which may harm the topminnow or its habitat.
6. Continues to implement the following measures to protect the Southwestern willow flycatcher and its habitat from grazing impacts:
- a. Exclude livestock grazing from occupied or unsurveyed, suitable habitat during the southwestern willow flycatcher breeding season (April 1-September 1) except for crossing lanes.
  - b. Authorize no livestock management activities, including development of range improvements, in the riparian zone of occupied or unsurveyed, suitable willow flycatcher habitat during the willow flycatcher breeding season.
  - c. Locate any new livestock management facilities that are likely to attract and support cowbirds more than five miles from occupied, suitable, or potential flycatcher habitat unless such facilities are crucial to protecting riparian habitat, and cowbird trapping is implemented to counteract the effect of the facility.
7. Adjusts livestock grazing rotation and utilization and installs more fencing, as needed, (1) to achieve the watershed cover required in the upland vegetation objective and (2) to leave enough cover after the summer livestock rotation to

meet cover needs for Pronghorn fawning as described in the pronghorn habitat objective (Upland Wildlife Habitat Sub-Objective B).

- 8. Adjusts grazing rotation by erecting a north-south Hilton pasture fence, and possibly an east-west Hilton pasture fence to ensure adequate cover for grassland sparrows as defined in the grassland sparrow subobjective (Upland Wildlife Habitat Sub-Objective A).

**Empirita Allotment (#6210)--  
Alternative 3 Proposed Management**

Summary of RMP-Level Proposal

Under Alternative 3, BLM would allocate **168 AUMs** of livestock grazing forage on 1,480 acres of the 1,520 acres of public lands within the Empirita allotment (#6210) and include the 40 acres at the Narrows in a livestock enclosure. BLM would continue to sublease the 23,468 acres of ASLD livestock grazing lease (05-437) to the Parsons Company.

Activity Plan Proposal

**Livestock Management Actions**

Alternative 3 would change the grazing management strategy for the Empirita allotment to a fixed conservative stocking rate with scheduled livestock rotations-next best pasture strategy, applying the traditional land management agency approach.

Summary of Empirita Grazing Management

- 1. Establish a conservative stocking rate (allowing for the dry years). The operator may run this number of cattle each year following a scheduled rotation that provides rest and deferments from livestock grazing. The stocking rate would be set at 229 CYL on the entire allotment (at 6% public land use) with scheduled rests and grazing deferments.
- 2. BLM, the Arizona State Land Department, the grazing lessee, and other interested parties would monitor use levels and vegetation changes.



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Alternative 3 would not apply the Biological Planning Team approach. Under Alternative 3, the range improvements proposed for Alternative 1 would still be developed and fencing and water developments would be installed for riparian pastures at the Narrows and around Nogales Spring. **Additional range improvements may be proposed and constructed in the future based on results of ecological monitoring and/or livestock management needs.**

3. Reduce utilization to 30-40% of current year's growth on key perennial grasses as described in the Alternative 3 Livestock Grazing Management Actions above.
4. Continue to implement the following measures to protect populations of Gila topminnow and topminnow habitat from grazing impacts:
  - a. Limit livestock use in riparian areas of Cienega Creek and Nogales Springs with perennial water to the Narrows crossing lane and watering area (See Table 2-25) and areas where BLM determines a need to use livestock grazing as a management tool to meet a riparian or aquatic-related resource objective.
  - b. Rotate use of crossing lanes and move cattle through them within 21 days.
  - c. Phase out water gaps in areas where adjacent upland waters are developed.
  - d. Inspect and maintain riparian exclosure fences at least **twice once** annually **just prior to use of lands adjacent to the exclosures.**
  - e. Locate all new repressos (i.e., earthen stock ponds) to minimize the likelihood of floods or humans moving exotic fish and bullfrogs into topminnow habitat.
  - f. Use repressos only when required to water cattle and allow repressos to dry when no longer needed to water cattle. Drain repressos if they do not dry annually. **The BLM would be responsible for any required draining of repressos not related to the livestock operation.**
  - g. Monitor the fish community and habitat including crossing lanes, grazed riparian zones, and repressos to document the level of incidental take and to check for introduction of exotic fish and bullfrogs.
  - h. Develop mitigation plans in coordination with the Fish and Wildlife Service for range improvements and vegetation treatments which may harm the topminnow or its habitat.
5. Continue to implement the following measures to protect the Southwestern willow flycatcher and its habitat from grazing impacts:
  - a. Exclude livestock grazing from occupied or unsurveyed, suitable habitat during the Southwestern willow flycatcher breeding season (April 1-September 1) except for crossing lanes.
  - b. Do not authorize livestock management activities including development of range improvements in the riparian zone of occupied or unsurveyed, suitable willow flycatcher habitat during the willow flycatcher breeding season.

- c. Locate any new livestock management facilities that are likely to attract and support cowbirds more than five miles from occupied, suitable, or potential flycatcher habitat unless such facilities are crucial to protecting riparian habitat, and cowbird trapping is implemented to counteract the effect of the facility.

**Rose Tree Allotment (#6043)--  
Alternative 3 Proposed Management**

Summary of RMP-Level Proposal

Under Alternative 3, the resource management plan proposal is to allocate **516 AUMs of** livestock grazing **forage** on 3,950 public land acres within the Rose Tree allotment with no exclosures. Grazing would also continue on the 3,719 acres of State Trust Land and 1,200 acres of private lands in the ranch operation for a total of 8,869 acres in the allotment.

Activity Plan Proposal

**Livestock Management Actions**

The activity plan proposal is to manage grazing with a conservative fixed stocking rate with scheduled livestock rotations-next best pasture strategy. Alternative 3 would apply the traditional land management agency approach.

Summary of Rose Tree Grazing Management

1. Establish a conservative stocking rate (allowing for the dry years) of 96 cattle year-long on the 3,950 acres of public lands at 46% public land use. The operator may run this number of cattle each year following a scheduled rotation that provides rest and deferments from livestock grazing.
2. BLM, the Arizona State Land Department, the grazing lessee, and other interested parties would monitor use levels and vegetation changes. Alternative 3 would not apply the Biological Planning Team approach. As under Alternative 1, BLM would need to complete an ecological site inventory for

this allotment to evaluate vegetation conditions. Also as under Alternative 1, BLM would need to evaluate current grazing management in light of the upland vegetation objective to determine if the allotment needs a new grazing management strategy (allotment management plan). The plan would include range improvements found to be needed to implement management changes.

3. Reduce utilization to 30-40% of current year's growth on key perennial grasses as described in the Alternative 3 Livestock Management Actions above.
4. Adjust livestock grazing rotation and utilization and erect more fencing as needed to leave enough cover after the summer livestock rotation to meet cover needs for Pronghorn fawning as described in the pronghorn habitat objective (Upland Wildlife Habitat Sub-Objective B) and the cover requirements in the upland vegetation objective.
5. Adjust grazing rotation as needed to ensure adequate cover for grassland sparrows as defined in the grassland sparrow subobjective (Upland Wildlife Habitat Sub-Objective A).

**Vera Earl Allotment (#6129)--  
Alternative 3 Proposed Management**

Summary of RMP-Level Proposal

Under Alternative 3, the resource management plan proposal is to allocate **192 AUMs of** livestock grazing **forage** on all 1,440 public land acres within the Vera Earl Allotment with no exclosures.

Activity Plan Proposal

**Livestock Management Actions**

The activity plan proposal is to manage grazing with a conservative fixed stocking rate, applying the traditional land management agency approach. BLM expects that the operator would

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continue the current rotational strategy with scheduled livestock rotations.

### Summary of Vera Earl Grazing Management

1. Because of the small acreage involved, the options for alternative management strategies would be limited if the rest of the Vera Earl allotment holdings are not included in the strategy for grazing of the 1,440 acres of public land.

#### **Option A:**

- Establish a conservative stocking rate (allowing for the dry years) of 16 CYL at 100% public land use.
- Allow seasonal livestock grazing by 48 cattle for a 4-month period during the year (48 CYL at 100% public land use = 144 AUMs). To prevent grazing during the same period each year, the operation would rotate the period of use. A conservative stocking rate would be established (allowing for the dry years) and the operator could run this number of cattle each year during the specified seasonal use period.

#### **Option B:**

- Base licensed on the total ranch holdings of about 23,240 acres, or 240 cattle for 12 months at 7% public land use (of which 1,440 acres is BLM administered). The other lands include national forest and about 6,000 acres of private land holdings of the ranch. The operator may run this number of cattle each year following a scheduled rotation that provides rest and deferments from livestock grazing.

The following actions would also be taken under either Option A or B for the Vera Earl allotment:

1. BLM would not use the Biological Planning Team approach under either Option A or B but, as under Alternative

1, would need to complete an ecological site inventory for this allotment to evaluate vegetation conditions. BLM would also need to evaluate current grazing management in light of the upland vegetation objective to determine if a new grazing management strategy (allotment management plan) is needed. The plan would include range improvements found to be needed to implement management changes.

2. Under either option, reduce utilization to 30-40% of current year's growth on key perennial grass species as described in the Alternative 3 Livestock Management Actions above.
3. Adjust livestock grazing rotation and utilization and erect more fencing as needed to leave enough cover after the summer livestock rotation to meet cover needs for Pronghorn fawning as described in pronghorn habitat objective (Upland Wildlife Habitat Sub-Objective B) and the cover requirements in the upland vegetation objective.
4. Adjust the grazing rotation as needed to ensure adequate cover for grassland sparrows as defined in the grassland sparrow subobjective (Upland Wildlife Habitat Sub-Objective A).

#### **Empire Mountains**

##### Summary of RMP-Level Proposal

Under Alternative 3, the resource management plan proposal for the Empire Mountains is to allocate **324 AUMs of** livestock grazing **forage** on 2,480 public acres of the 3,524 total acres within the proposed Empire Mountains Allotment with no exclosures. The allotment would also include 1,040 acres of private lands.

##### Activity Plan Proposal

##### **Livestock Management Actions**

The activity plan proposal is to manage grazing

with a conservative fixed stocking rate with scheduled livestock rotations-next best pasture strategy. This alternative would apply the traditional land management agency approach.

Summary of Empire Mountains Grazing Management

Prior to authorization of any active livestock use on the new Empire Mountains allotment, the grazing lessee would be required to submit a proposed Allotment Management Plan developed with full cooperation of the private land owners within the allotment boundary. The plan must include necessary water and pasture development to provide adequate yearly rest for rangeland health. The plan must also include executed leases for grazing use of private lands and easements for fences, waters, and livestock ingress and egress. An economic analysis would be required showing sources and timeframes for funding of the necessary infrastructure. An environmental analysis and biological assessment on the plan would also be required including completion of an ecological site inventory. The following steps must be completed before the allotment can be activated:

1. Before authorizing any use, BLM would complete a community-based grazing management plan with the affected lessee, agencies, and the private land owners.
2. Establish a conservative stocking rate (allowing for the dry years) of 38 cattle year-long on the 3,524 acres allotted for grazing in the allotment (38% public land use). The 2,480 public land acres would be grazed on the allotment, according to the scheduled rotation that provides rest and deferments from livestock grazing.
3. BLM, the lessee, the Natural Resources Conservation Service, and other interested parties would monitor use levels and vegetation changes. Alternative 3 would not apply the

Biological Planning Team approach. As under Alternative 2, BLM would need to complete an ecological site inventory for this allotment to evaluate vegetation conditions and develop an allotment management plan. The plan would include range improvements found to be needed to implement management changes.

4. Set the utilization limit to 30-40% of current year's growth on key perennial grasses as described in the Alternative 3 Livestock Management Actions section above.

**Recreation Management Actions**

Management within Recreation Zones

Table 2-26 summarizes the management prescriptions for each recreation zone. BLM would apply these prescriptions regardless of the different zone configurations under different alternatives.

Management of Designated Recreation Sites

Under Alternative 3, BLM would establish five group sites: Maternity Well, the Air Strip, Agricultural Fields, Antelope Release 1 Road Canyon, and Antelope Release 2 Hilton; five camp areas: Agricultural Fields, Antelope Release 1 Road Canyon, Cieneguita, Oak Tree, and Oil Well; and at least 14 pullouts (Map 2-29). BLM would manage these sites according to the general management prescriptions for group sites, camp areas, and pullouts as described for Alternative 2.

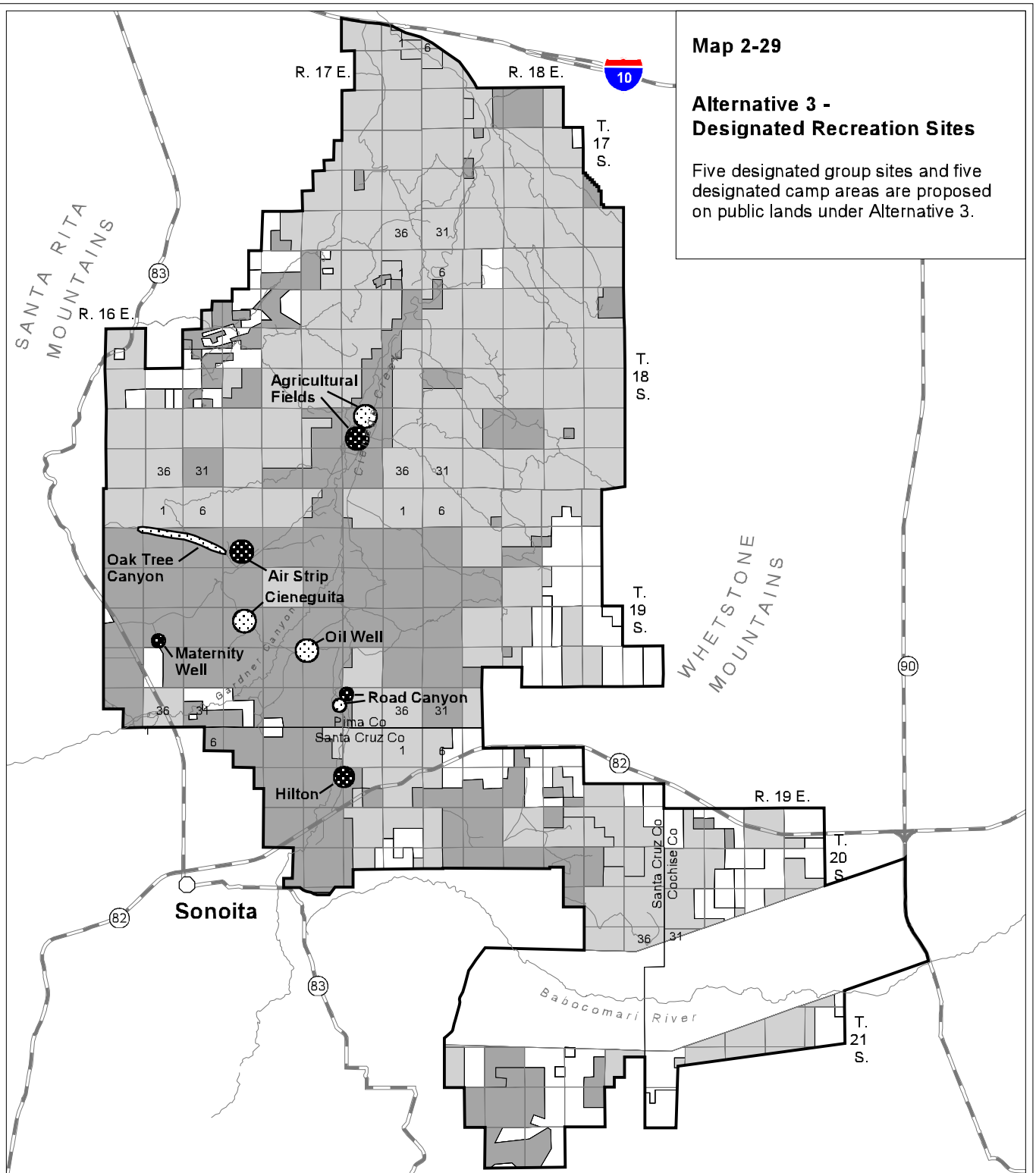
Under Alternative 3, the capacity for the following group sites (general guidance only) is as follows:

- **Maternity Well:** 150 people or 30 vehicles with horse trailers or recreational vehicles.

Map 2-29

**Alternative 3 -  
Designated Recreation Sites**

Five designated group sites and five designated camp areas are proposed on public lands under Alternative 3.



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Designated Group Site
- ⊙ Designated Camp Area
- Road

- **Air Strip:** 500 people (day use and group use areas). The vehicle capacity in the day use/trailhead area is 30 vehicles.
- **Agricultural Fields:** 2 1,000 people.
- **Antelope Release 1 Road Canyon:** 50 people.
- **Antelope Release 2 Hilton:** 50 people.

Under Alternative 3, the Air Strip site would have the same management prescription as under Alternative 2, but proposed developments would be expanded to include the building of permanent toilets and water supplies.

Under Alternative 3, the Agricultural Fields would be open for group use on a reservation basis and would also be open to individual use when not reserved by a group. Only low-impact activities would be allowed with a duration of one week or less. BLM would designate a camping area on the eastern edge near the canal. No development is proposed except for water at the Field Well. The Agricultural Fields will be open seasonally, but could be closed or visitor numbers restricted in response to environmental changes from restoring the area.

Under Alternative 3, the **Antelope Release 1 Road Canyon** and **Antelope Release 2 Hilton** group sites would be open for group use on a reservation basis and would also be open to individual use when not reserved by a group. Only low-impact activities would be allowed. The group sites would be closed during Pronghorn fawning (April-June) and may have other seasonal closures depending on resource conditions.

#### **Designated Road Crossings**

Under Alternative 3, the route designations (Map 2-13) limit motorized vehicles to four crossings of Cienega Creek (only one across perennial

section) and one crossing of Empire Gulch (only one across perennial section) (See Table 2-19A). There are six additional designated non-motorized crossings on Cienega Creek.

#### **Alternative 4: Activity Plan Management Actions**

##### ***Management Actions Common to Alternatives 2, 3, and 4***

See Alternative 2 for Management Actions Common to the Action Alternatives for Upland Vegetation, Riparian, Fish and Wildlife, **Mineral Resources**, Cultural Resources, Access and **Transportation**, and Recreation Management Actions.

##### ***Cultural Resource Management Actions***

##### **Empire Ranch Headquarters**

Management under Alternative 4 would be the same as under Alternative 2 with the following exception: Because livestock would no longer graze on public lands, adaptive reuse would also occur for buildings that were supporting the grazing permittee.

##### **Cultural Properties Outside the Headquarters Area**

Management under Alternative 4 would be the same as under Alternative 2, except for the following:

1. Selected sites outside the ranch headquarters would be allocated for scientific use. No properties or sites outside the ranch headquarters would be allocated for public use.
2. Any interpretive displays about prehistory or history of the ranch would be located at the headquarters area.
3. Class III cultural resource surveys would be conducted on 86.8 83.9 miles of roads and trails by 2004 (**dependent on adequate funding**). A Class II cultural resource survey would be conducted on the planning area as funded. Class III

cultural resource surveys would be conducted as needed on a project-by-project basis.

### **Alternative 4 Livestock Grazing and Recreation Management Actions**

Under Alternative 4, BLM would no longer allocate forage for livestock grazing on 43,594 acres of public lands within four existing allotments. BLM would **phase in the removal of livestock and would** cancel the grazing leases on the four grazing allotments (i.e., Empire-Cienega, Empirita, Rose Tree, and Vera Earl) **as the permits expire**. BLM would need to fence all the public lands to prevent unauthorized grazing from intermingled State Trust and private lands that are owned or leased by livestock operators for grazing use, if grazing use continues on these lands.

Table 2-30 shows the total acres in each allotment; public land acres to be closed to livestock grazing; **maximum** miles of fence that would be needed to exclude livestock grazing **from all BLM parcels**; and current authorized grazing use that would be canceled under Alternative 4 for each of the allotments. The last column shows the total number of livestock that potentially could continue to be stocked on State Trust and private lands within the four allotments on the basis of current stocking rates.

**As livestock removal is phased in on public lands, the following actions would occur:**

- **Initially, existing fencing would be used to exclude livestock from about 50% of public lands including almost all riparian areas.**
- **Additional fencing would be constructed as needed to exclude livestock from most or all of the public lands.** To prevent livestock trespass from adjacent State Trust and private lands **if they continue to be grazed**, BLM would need to build **at a maximum of 110 miles** of fencing

to enclose **all of** the 46,074 public lands as shown in Table 2-30. **At least 40 miles of fencing would probably need to be constructed to exclude livestock from the majority of public lands located in larger blocks.**

- **In the interim, while some public lands are still grazed, cattle use in riparian areas would be further restricted. Only upland watering areas would be used and only two crossing lanes would be available.**
- The interior pasture fencing for livestock watering and handling facilities would be removed where **no longer** needed from public lands.

Table 2-31 shows the total vegetation production in favorable, normal, and unfavorable years (based on rainfall) on the public lands that would be closed to grazing. With the removal of livestock grazing from public lands, the additional forage on public lands would be allocated as wildlife habitat and for watershed protection. Also shown is the total vegetation production on State Trust and private lands within each allotment and the average amount of forage that livestock could continue to consume (based on the current maximum stocking rates) on these lands, if grazing continues. The **available useable** forage is assumed to be 50% of the total forage produced multiplied by the current 50% utilization on lands allocated for livestock grazing.

**However, if conservation use was applied for and granted on State Trust Lands so that they were not grazed, then most of the boundary fencing would no longer be necessary and all of the forage could be allocated for watershed and wildlife values.**

### **Recreation Management Actions**

#### **Designated Recreation Sites**

Alternative 4 would establish one group site at

**Table 2-30**  
**Public Lands to be Closed to Livestock Grazing and Fencing Needed to Exclude Livestock from Public Lands Under Alternative 4**

Allotment	Total Acres of Open Space in Current Grazing Allotments	Acres of Public Lands to Be Closed to Grazing	Miles of Fencing Needed to Fence Public Lands	Cattle to Be Removed from Public Lands in the Planning Area	Cattle Potentially Remaining on State and Private Lands Within Existing Allotments in the Planning Area
Empire-Cienega	74,146	36,684	116	704	796
Empirita	24,988	1,520	12	9	328
Rose Tree	8,869	3,950	10	92	108
Vera Earl	1,440	1,440	2	27	N/A
<b>TOTAL:</b>	<b>109,443</b>	<b>43,594</b>	<b>140</b>	<b>832</b>	<b>1,232</b>

<sup>1</sup> Based on Alternative 1 (Current Management).

**Table 2-31**  
**Forage Produced under Three Rainfall Regimes and Livestock Forage Consumption Under Alternative 4 Livestock Management (No Livestock on Public Lands) Assuming Continued Stocking of State and/or Private Lands, Las Cienegas Resource Management Plan**

	Public Land Acres Closed to Grazing	Total Production Ungrazed Acres (Million-lbs.)	Total Acres Grazed (State and/or Private)	Total Cows	Total Production Of State and Private Grazed Acres (Million-lbs.)	Production Consumed By Total Cows (Million-lbs.)	% Total Production Consumed	Available Useable Forage (Million-lbs.)	% Available Useable Forage Consumed
Favorable Year	43,594	77.45	65,849	1,232	104.5	11.8	11.3	26.1	45.2
Normal Year	43,594	51.71	65,849	1,232	69.6	11.8	17.0	17.4	67.8
Unfavorable Year	43,594	34.42	65,849	1,232	45.6	11.8	25.9	11.4	100

the Air Strip, designate four camping areas at Antelope Release 1 Road Canyon, Oak Tree, Cieneguita, and Oil Well, and prescribe at least 10 pullouts (Map 2-30). BLM would manage these sites according to the general management prescriptions for group sites, camp areas, and pullouts as described for Alternative 2. Under Alternative 4, BLM would open the Air Strip site to group use on a reservation basis and to

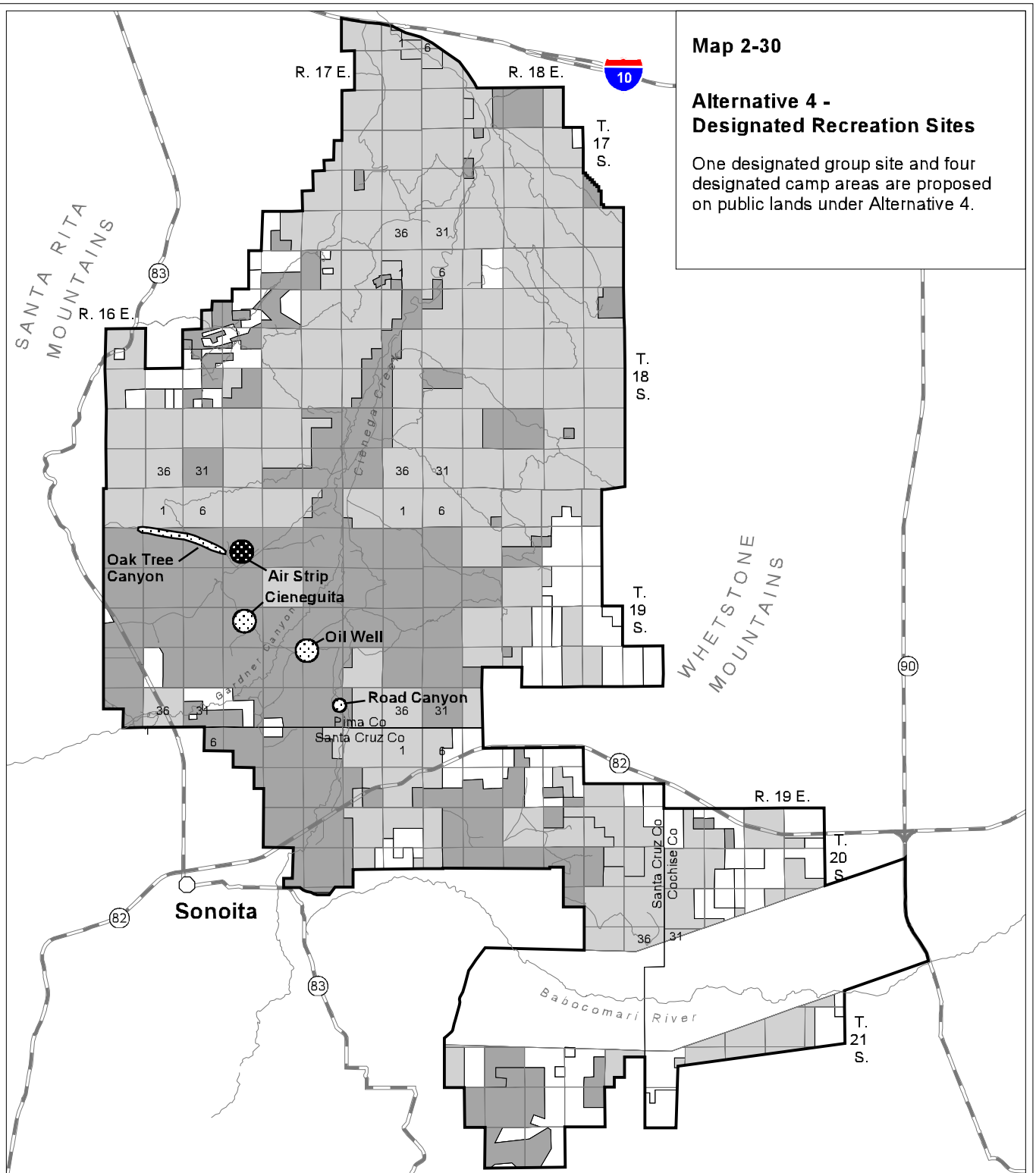
individual and day use when no groups have reserved the site with a permit. The site's capacity would be set at 300 people, but could be less depending on the type of activity. BLM would rehabilitate (rip and re-vegetate) about one-third of the air strip and partially re-vegetate the remaining two-thirds. The group site would have no other improvements. Parking would be limited to one end of the group site in an area



**Map 2-30**

**Alternative 4 -  
Designated Recreation Sites**

One designated group site and four designated camp areas are proposed on public lands under Alternative 4.



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Designated Group Site
- Designated Camp Area
- Road

marked by barriers using natural materials. BLM would allow group activities only under a special recreation permit and would monitor impacts to determine if the site's management needs to be adjusted. Under Alternative 4, the trailhead for the Arizona Trail would be placed at the ranch headquarters

#### **Designated Road Crossings**

Under Alternative 4, the route designations (Map 2-18) limit motorized vehicles to four crossings of Cienega Creek (only one across perennial section) and one crossing of Empire Gulch (only one across perennial section) (See Table 2-19A). There are no additional designated non-motorized crossings on Cienega Creek or Empire Gulch.

## **PLAN IMPLEMENTATION**

### **IMPLEMENTATION OF FINAL DECISIONS**

Any individual who has participated in this land use planning process may seek an administrative review by the Director of the BLM of any proposed land use plan decision. Following completion of the planning protest process, an Approved RMP/Record of Decision (ARMP/ROD) will be published. Land use plan decisions (Chapter 2, Section A) are essentially implemented upon approval of the RMP. Those management actions (Chapter 2, Section B) which require additional site specific project planning as funding becomes available will require further analysis. Decisions to implement site specific projects are subject to administrative review at the time such decisions are made.

### **REQUIREMENTS FOR FURTHER ENVIRONMENTAL ANALYSIS**

This Final EIS is a programmatic statement describing impacts of implementing both

proposed land use plan decisions (Chapter 2, Section A) and associated management actions (Chapter 2, Section B) in the planning area. Site specific environmental analyses and documentation (including the use of categorical exclusions and determinations of NEPA adequacy where appropriate) may be prepared for one or more individual projects, in accordance with management objectives and decisions established in the approved land use plan.

Interdisciplinary impact analysis will be based on this and other applicable EISs. If the analysis prepared for site specific projects finds potential for significant impacts not already described in an existing EIS, another EIS or a supplement to an existing EIS may be warranted.

## **CONTINUED PUBLIC INVOLVEMENT**

BLM will continue to involve and collaborate with the public during implementation of this plan. Opportunities to become involved in the plan implementation and monitoring will include participation in The Sonoita Valley Planning Partnership, Empire Ranch Foundation, Biological Planning Process, and other partnerships.

## **MONITORING AND PLAN EVALUATION**

### **MONITORING**

Monitoring is an essential component of an adaptive management strategy. Monitoring data is used to assess resource conditions, identify resource conflicts, determine if resource objectives are being met, and periodically refine and update desired conditions and management strategies.

Ongoing monitoring that would be continued under all alternatives (See Appendix 2 for monitoring protocols) includes the following:

## Chapter 2: Monitoring and Plan Evaluation

Native Fish Monitoring. At least five aquatic habitats will be monitored annually using one-pass sampling with seines to determine relative abundance and population trends of Gila topminnow and to screen for exotic fishes and bullfrogs.

Aquatic Habitat Monitoring. At least 4 - 0.25 mile reaches of Cienega Creek will be monitored every three years to determine habitat trends.

Riparian Monitoring. Riparian condition will be reassessed every five years at key riparian monitoring sites for segments currently in proper functioning condition. Segments which are not in proper functioning condition will be monitored every 2-5 years depending on the type of management change being implemented.

Upland Vegetation Monitoring. Upland vegetation will be monitored at permanent vegetation transects on the Empire-Cienega and Empirita allotments. A proportion of these transects will be monitored annually. In addition, habitat components for pronghorn fawns and grassland sparrows will be monitored annually along transects in key areas.

Water Quantity Monitoring. Stream discharge measurements will be obtained from a continuous recording stream gage on Cienega Creek.

### Wildlife Monitoring.

*Monitoring Avian Productivity and Survivorship (MAPS) Bird Banding Station:* A MAPS station is scheduled to be established in 2002. MAPS is a nationwide network of bird-banding stations, operated during spring and summer, to collect data on the productivity and survival rates of land bird populations. The operation of a MAPS banding station entails a total of only 6-10 days every year between May and August. The purpose of MAPS station is to provide long-term data on the productivity, survivorship and population sizes of land bird species through constant-effort mist-netting and banding during the breeding season. The major objective of the MAPS

program is to contribute to an integrated avian population monitoring system for North American land bird species by providing annual regional indices and estimates for four population and demographic parameters: adult population size, post-fledging productivity, adult survivorship, and recruitment into the adult population

Annual willow flycatcher surveys will be conducted in suitable habitat for a minimum of 3 years to determine if additional pairs are colonizing the area and if so whether successful nesting is occurring. If breeding pairs are found to be regularly using the area, then monitoring will be continued for the longer term.

In August 2001, BLM established 5 photo plots to monitor yearly fluctuations in agave abundance. These plots will be sampled annually. In addition, a plot based methodology to assess influences of herbivory on agave being tested by the University of Arizona Range Department will be evaluated for use on the planning area.

Habitat components for pronghorn fawns and grassland sparrows will be monitored annually along transects in key areas. A pronghorn habitat study initiated by the AGFD in the spring of 2002 should help refine future monitoring needs and appropriate methodologies.

Wetland ponds in the floodplain of Cienega Creek will be monitored annually for presence of native frogs and bull-frogs and control program for bull-frogs continued as necessary.

BLM is contracting in 2002 with the University of Arizona to assist in inventory of Cienega Creek for aquatic herptiles and development of a long-term monitoring program.

Visitor Use and Impacts Monitoring.  
In Fall 2001, BLM contracted with the University of Arizona to inventory for and establish a visitor use and impacts monitoring program for Las Cienegas NCA. This work will be carried out in phases during the next three

years (described below), and will be integrated with the implementation of this plan.

*Phase I – Assessing Visitor Impact Conditions.*

This assessment will consist of mapping all existing visitor impact areas (campsite locations, drainage areas, existing gates, fences, trailheads, etc.). In addition, all visitor impact areas will be inventoried using a modified version of the Cole Campsite inventory methodology. This methodology evaluates each of the impact areas, examining vegetation cover, firewood availability, vegetation density, composition, total area impacted, barren core area, litter and duff, social trails, mutilations etc. The data collected for each of the locations will be used to derive an impact condition ranking as well as to determine viable, quantitatively evaluated ecological indicators that can be used for establishing a long term monitoring program.

*Phase II – Visitor Use/Social Inventory & Monitoring .*

This inventory/monitoring phase will be undertaken to capture baseline information on both spatial and temporal patterns of dispersed visitation of the conservation area. In addition, monitoring will be established to capture current patterns of recreational vehicular use in the NCA. The inventory process will involve undertaking a stratified sample of known trail head/entrance locations to the conservation area. Both overnight and day use activities will be assessed. At all major trailhead/entrances, a self-administered automated card/diary system will be established to capture spatial/temporal patterns of use in those designated areas. Trail counters will be used to quantify volume of use, anticipating that not all those visiting the area will take the time to use the diary. Day use cards will also be used at these locations to capture similar information from those only intending on spending the day in the conservation area.

*Phase III – Using Simulation to test alternative Management plans and Derive Capacity Measures.* This phase of the project will construct a simulation system using data collected

during the first two phases to simulate and evaluate management alternatives considered in the conservation area's management plan. The simulation system will allow managers to identify issues such as points of overcrowding, bottlenecks in circulation, parking capacity at trailheads, conflicts between different user groups and associated environmental impacts, distribution of use with proposed road closures, impacts of proposed commercial or new visitor activities before committing resources to expensive construction projects. More importantly, the simulation environment will provide managers with the capability to explore visitor capacities and their associated impacts. This phase will assist in determining where increase use will be expected, how much and aid in establishing a monitoring plan for both visitor use and associated impacts.

Under Alternatives 1 and 2, the biological planning process would be continued as described in the livestock grazing management actions for the Alternatives 1 and 2-activity plans. Depending on the issues for that session, monitoring data collected for biological planning will include:

- Precipitation
- Rangeland ecological site (range) condition
- Riparian and aquatic condition
- Vegetation trends
- Vegetation utilization
- Soil cover
- Wildlife populations and habitats
- Livestock pasture use records
- Livestock pasture recovery (new production)
- Recreation post-use reports

Informal evaluations of monitoring data would occur twice a year when the Biological Planning Team meets to discuss livestock and recreation management activities.

In addition, under Alternatives 2, 3, and 4, a threat-based ecological monitoring program is proposed (See Appendix 2) to expand ongoing

monitoring efforts. The ecological monitoring program would be fully developed **as a separate document but would be** as an integral part of BLM's Final Las Cienegas Resource Management Plan. **The monitoring program** and would help ensure that the Empire-Cienega RCA's (now Las Cienega's NCA) resources are protected over both the short- and long-term under a flexible, multi-use management plan. Development of partnerships would be an important factor in implementing the monitoring program.

### PLAN EVALUATIONS

Plan evaluations determine whether the land use plan decisions and NEPA analysis are still valid and whether the plan is being implemented. At a minimum, BLM will conduct formal plan evaluations every five years. Results of plan evaluations will be included in a report to the BLM Field Manager. The following questions are generally addressed in plan evaluations:

1. Are actions outlined in the plan being implemented?
2. Is BLM achieving or likely to achieve resource goals, standards, and objectives?
3. Are the allocations, constraints, or mitigation measures effective in achieving objectives?
4. Do decisions continue to remain valid over time?
5. Has there been significant change in the related plans of Indian tribes, State or local governments, or other federal agencies?
6. Are new data or analyses significant to the planning decisions or the validity of the NEPA analysis?
7. Can unmet needs or new opportunities

best be met through a plan amendment or revision or will current management practices be sufficient?

8. Is new information needed to resolve a new or existing issue?

### INFORMATION NEEDS

The actions in this section are proposals to increase the knowledge base for the Empire-Cienega Planning Area. In some instances, BLM must have the information from these inventories or studies before changing management. In other instances such information is desirable for making more informed land management decisions. These studies and inventories will supplement the monitoring proposals in tracking the progress of proposed actions in meeting resource objectives.

### INVENTORIES AND ASSESSMENTS

1. Assess the road system to determine what design changes are needed to halt excessive erosion or other resource impacts.
2. Inventory all natural and developed water sources within the planning area to determine their use and reliability as wildlife water sources and to determine if more waters are needed.

### VEGETATION STUDIES

1. In partnership with other agencies and entities, continue to complete ecological site inventories of all lands in the planning area. In particular, inventories are needed of the current vegetation conditions in the Rose Tree and Vera Earl allotments and the Empire Mountains.

2. Continue to work on developing and refining riparian ecological site descriptions (including sites for interior marshland communities) for Empire-Cienega riparian areas.
3. Place surveyed cross sections in key riparian segments (geo-referenced).

### **FISH AND WILDLIFE STUDIES**

As funding and priorities allow, support research in priority species and habitats including the following:

1. Collect information on roost locations and the timing and level of use of flowering agave by lesser-long-nosed bats in the Sonoita Valley and the relationships of grazing and prescribed fire to survival and reproduction of agave populations.
2. Study pronghorn and mule deer including population viability, movements, and use patterns to determine population and habitat relationships to proposed land

uses and ongoing development patterns. Study the effect of prescribed fire on Baird's and Botteri's sparrows

3. Study the effect of prescribed fires in uplands on water quality and on the fish community in Cienega Creek.

### **CULTURAL RESOURCE STUDIES**

1. Conduct a Class II cultural resources inventory of the planning area as funding allows.
2. Conduct ethnographic and historic studies for the planning area, including ethnoecology and an oral history collection as funding allows.

### **COMPARATIVE SUMMARY OF IMPACTS BY ALTERNATIVE**

See Table 2-32, beginning on the following page.



**Table 2-32.  
Comparison of Impacts, Las Cienegas Resource Management Plan**

<b>Resource Affected</b>	<b>Impacts From Alternative 1 (Current Management)</b>	<b>Impacts From Alternative 2 (Agency Preferred)</b>
<b>PHYSICAL RESOURCES</b>		
<b>Air Quality</b>	No impacts.	Short-term lowering of air quality from prescribed fires.  Slight improvement in air quality from road restrictions or closures and recreation permit system.
<b>Watersheds</b>  <b><i>Scope of Analysis: Impacts to watershed resources and processes, including soils, groundwater, surface water, and vegetation cover.</i></b>	<p>Alternative 1 might fail to meet upland and riparian vegetation objectives over the long term due to watershed impacts such as increased erosion and runoff and decreased infiltration from lack of vegetation treatments. The result would be a shrub invasion combined with impacts of grazing, increasing unmanaged recreation, an extensive road network, proliferating utility lines, and potential for mineral development, which would disrupt hydrologic processes.</p> <p>Impacts from developments and concentrated activities, including roads, utility lines, recreation sites, administrative sites, and livestock developments total 2,680 acres (5.5%) of public land. Impacts include loss of vegetation cover, soil disturbance, increased erosion, and sedimentation.</p> <p>Dispersed recreation impacts would occur on all 49,000 acres of public land. Impacts could include localized loss of vegetation cover; soil disturbance; and increased erosion from roads, trails, and dispersed camp sites.</p> <p>Livestock grazing impacts would occur on 41,855 acres (85%) of public land and could include loss of vegetation cover, increase in shrub component, and soil disturbance.</p>	<p>Alternative 2 more emphasizes maintaining and improving overall watershed health than do Alternatives 1, 3, or 4 due to the emphasis on ecosystem (watershed) management and collaboration, combined with flexible grazing management; integrated vegetation treatment; elimination of potential for mineral development; and designation of utility corridors, recreation zones, and all public land in planning area as an ACEC.</p> <p>Impacts from developments and concentrated activities, including roads, utility lines, recreation sites, administrative sites, and livestock developments, total 2,400 acres (4.9%) of public land. Impacts include loss of vegetation cover, soil disturbance, and increased erosion and sedimentation.</p> <p>Dispersed recreation impacts would occur on 44,387 acres (91%) of public land. Impacts could include localized loss of vegetation cover; soil disturbance; and increased erosion from roads, trails, and dispersed camp sites.</p> <p>Livestock grazing impacts would occur on 42,155 acres (86%) of public land. Impacts could include loss of vegetation cover, increased shrub component, and soil disturbance. Livestock grazing management under Alternative 2 would improve watershed conditions and aid in attaining the upland and riparian objectives better than would Alternative 1. Adaptive management of livestock numbers and rotation systems adjusted for current grass production would likely improve vegetation and soil cover conditions and stability.</p>

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### Impacts From Alternative 3

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### Impacts From Alternative 4

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Same as under Alternative 2.

Same as under Alternative 2.

Of all alternatives, Alternative 3 least emphasizes maintaining and improving watershed health due to large area open to mineral development, less flexible grazing management, and 90% less area designated as ACECs.

Of all alternatives, Alternative 4 would most emphasize maintaining and improving watershed health on the public land portion of the watershed due to elimination of mineral development and public land livestock grazing, extensive road closures, and designation of only one utility corridor. But the cumulative impacts of the loss of open space and decline in watershed condition could be substantial if ranches are sold for development due to loss of public grazing lands.

Impacts from developments and concentrated activities including roads, utility lines, recreation sites, administrative sites, and livestock developments total **about** 2,440 acres (5%) of public land. Impacts would include loss of vegetation cover, soil disturbance, and increased erosion and sedimentation.

Impacts from developments and concentrated activities, including roads, utility lines, recreation sites, and administrative sites, total **about** 540 acres (1%) of public land. Impacts would include loss of vegetation cover, soil disturbance, and increased erosion and sedimentation.

Dispersed recreation impacts would occur on 31,040 acres (63%) of public land. Impacts could include localized loss of vegetation cover; soil disturbance; and increased erosion from roads, trails, and dispersed camp sites. Recreation management is likely to have a beneficial long-term impact, and of all alternatives would go further to facilitate meeting the upland vegetation objective due to the larger area in Zones 1 and 2, which restrict uses to designated sites.

Dispersed recreation impacts would occur on 45,730 acres (93%) of public land. Impacts could include localized loss of vegetation cover, soil disturbance, and increased erosion from roads, trails, and dispersed camp sites.

Livestock grazing impacts would occur on ~~43,895~~ **45,375** acres (90-92%) of public land. Impacts could include loss of vegetation cover, increased shrub component, and soil disturbance. Grazing management would be more likely to degrade watershed conditions over the long term than grazing management under Alternative 1 due to potentially slower adjustments in drought years.

Livestock grazing impacts would be eliminated on public land over the long term, but some impacts would temporarily remain.



Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>PHYSICAL RESOURCES</b>		
<p><b>Watersheds, continued</b></p> <p><i>Scope of Analysis: Impacts to watershed resources and processes, including soils, groundwater, surface water, and vegetation cover.</i></p>	<p>Potential for mining impacts on <del>6,373</del> <b>7,625</b> acres (<del>13</del> <b>14</b>%) of public land and federal mineral estate. Impacts could include reduced water quantity, loss of vegetation cover, soil removal, decreased water infiltration, increased runoff, increased erosion and sedimentation, and associated channel adjustments.</p>	<p>Potential for mining impacts would be eliminated except for developing existing claims on <del>6,373</del> <b>7,625</b> acres of public land and federal mineral estate.</p> <p>Vegetation treatments would improve watershed condition over the long term by reducing shrubs and promoting grass cover, which decreases runoff and improves infiltration. Fish and wildlife habitat improvements would enhance vegetation structure, and increased cover would promote healthy watershed conditions.</p>
<b>Water Quality</b>	<p>No direct, indirect, or cumulative impacts on water quality are expected from current watershed, upland, and riparian area management; VRM Class III designation; or lack of ACEC designation. Impacts would be generally positive from fish and wildlife management. Even limited actions to improve habitat for special status species would reduce runoff, erosion, sedimentation, and turbidity, contributing to improved water quality. Actions taken to meet cultural resource objectives would have an imperceptible impact, but restoring historic sites might increase visitation and traffic with associated harm to road condition, erosion, and water quality.</p> <p>Any mineral development under current management would become a potential source of water quality degradation. Without designating a utility corridor, rights-of-way could proliferate, increasing disturbed or exposed surface area and runoff, erosion, and sedimentation in Cienega Creek.</p>	<p>Increasing vegetation cover resulting from watershed and upland vegetation management, particularly vegetation treatments, would reduce runoff, erosion, and sedimentation of drainages. Riparian area management would also reduce the load of sediment entering the channels of the management area. Fish and wildlife management actions to improve habitat through overall watershed condition improvement would reduce runoff, erosion, sedimentation, and turbidity, improving water quality. No impacts are expected from VRM Class II designation. Cultural resource management impacts would be the same as under Alternative 1.</p> <p>Continuing current closure to mineral development and petitioning to withdraw more lands from mineral entry would significantly lower the risk of future water quality degradation from mining contaminants that could reach Cienega Creek in runoff. Designating right-of-way corridors would limit impacts on water quality to those occurring in existing rights-of-way.</p>

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### Impacts From Alternative 3

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Potential for mining impacts on ~~46,915~~ **48,167** acres ( ~~96.86~~%) of public land and federal mineral estate. Impacts could include reduced water quantity; loss of vegetation cover; soil removal; decreased water infiltration; increased runoff, erosion, and sedimentation; and associated channel adjustments.

Vegetation treatments would improve watershed condition over the long term by reducing shrubs and promoting grass cover, which decreases runoff and improves infiltration. Fish and wildlife habitat improvements would enhance vegetation structure, and increased cover would promote healthy watershed conditions.

Impacts from watershed, upland, riparian, fish and wildlife, cultural and visual resource management would be the same as described for Alternative 2.

Mineral development would degrade water quality as described for Alternative 1 but over a potentially much larger area because public land outside ACECs would be opened to mining.

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### Impacts From Alternative 4

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Potential for mining impacts would be eliminated except for developing existing claims on ~~6,373~~ **7,265** acres of public land and federal mineral estate.

Vegetation treatments would improve watershed condition over the long term by reducing shrubs and promoting grass cover, which decreases runoff and increases infiltration. Fish and wildlife habitat improvements would enhance vegetation structure, and increased cover would promote healthy watershed conditions.

Impacts from watershed, upland, riparian, fish and wildlife, cultural and visual resources management would be the same as described for Alternative 2.

Impacts from mineral development, utility rights-of-way, land use authorizations, and off-highway vehicle and recreation management would essentially be the same as described for Alternative 2.

Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>PHYSICAL RESOURCES</b>		
<b>Water Quality, continued</b>	<p>Unpaved roads are a significant source of turbidity and sedimentation in drainages such as Cienega Creek, which receives runoff from the entire planning area. Lack of road closures or restrictions and increased use of the existing road network would continue to degrade water quality in Cienega Creek.</p> <p>Slightly negative impacts, including runoff, sedimentation, and even bacterial contamination of surface water, would result from dispersed, unrestricted recreation. As use increases, the impacts on water quality would likely increase at a higher rate than under the other alternatives.</p> <p>Impacts from current grazing management on water quality would be similar to impacts of grazing on watershed, riparian, and aquatic resources. Maintaining or improving the condition of riparian and upland pasture vegetation is highly important in improving water quality.</p>	<p>Designating roads for OHV use would reduce the number of roads on which vehicles would travel. The result would be a reduced risk of increased sedimentation, turbidity, and accidental spills of petroleum products in Cienega Creek and its tributaries. There is a long-term risk of negative impacts if OHV use increases to a level at which benefits of designated roads would be offset by the damage done by increased traffic. Designating recreation zones and associated management would only slightly affect water quality. Loss of vegetation cover at concentrated recreation use sites would slightly increase sedimentation in drainages. Establishing concentrated use areas and increasing use of dispersed hiking and camping areas, particularly near streams, would increase the risk of human waste degrading water quality. New construction for the Arizona Trail would cause a transitory increase in sedimentation in Cienega Creek, especially where the trail is runs close to the creek. Livestock grazing impacts would be similar to those under Alternative 1 and would slightly reduce turbidity and fecal coliform in Cienega Creek over time.</p> <p>ACEC designation should help promote improved water quality through management prescriptions to improve vegetation cover and manage livestock and recreation to minimize direct impacts to streams.</p>
<b>BIOLOGICAL RESOURCES</b>		
<p><b>Upland vegetation</b></p> <p><i>Scope of Analysis: Changes in upland vegetation condition and ability to meet the upland vegetation objective.</i></p>	<p>Lack of an integrated vegetation treatment strategy would result in long-term invasion of mesquite and burroweed into grassland sites. This invasion would cause a decline of herbaceous vegetation cover on the soil surface and an increase in deeper rooted woody perennials. If the trend continues, ecological condition would fail to meet the Arizona Standards for Rangeland Health.</p>	<p>Implementing an integrated vegetation treatment would reverse the long-term invasion of woody species. These treatments would convert nearly 20,000 acres of shrub-invaded grassland to a visual aspect of open grassland. Improved upland condition would result. Objectives for fish and wildlife would guide upland vegetation management and might constrain vegetation treatments and range improvements.</p>

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**Impacts From Alternative 3**

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**Impacts From Alternative 4**

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Impacts from utility rights-of-way and land use authorizations, off-highway vehicle management, and the Arizona Trail would be the same as described for Alternative 2.

Recreation management would be likely to similarly affect water quality as under Alternative 2. Many more acres in Zone 2 could slightly increase concentrated use, and result in an associated increase in runoff and risk of degrading water quality.

Livestock grazing management would have greater water quality impacts than under Alternatives 1 and 2 due to the fixed stocking rate. Under unfavorable conditions such as drought, the less flexible management could result in overgrazing and insufficient cover to protect the surface. Sedimentation, increased turbidity, and exceeding standards for fecal coliform could result.

ACEC designation would also benefit water quality but less than under Alternative 2, which would have four times more area in ACECs.

The Arizona Trail would follow existing roads and would not require construction.

Eliminating livestock grazing would likely increase upland cover and end cattle disturbance of riparian areas and stream banks. The resulting infiltration of more precipitation and increased density of vegetation in the riparian areas would improve water quality. Sediment, turbidity, and fecal coliform in perennial water would decline. Improvement in water quality is likely to be modest because upland condition is already good and water quality is now meeting state standards.

Benefits of ACEC designation would be the same as under Alternative 2.

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Impacts from watershed, upland, riparian, fish and wildlife, cultural, and visual resource management would be the same as described for Alternative 2.

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Impacts from watershed, upland, riparian, fish and wildlife, cultural, and visual resources management would be the same as described for Alternative 2.

Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>BIOLOGICAL RESOURCES</b>		
<b>Upland vegetation, continued</b>	Current fish and wildlife and cultural resource management would not affect upland vegetation.	Implementing VRM Class II could more constrain vegetation treatments and range improvements than the less restrictive VRM Class III. Cultural resource management would also constrain vegetation treatments and range improvements and increase the cost of achieving desired upland vegetation conditions.
<b>Scope of Analysis: Changes in upland vegetation condition and ability to meet the upland vegetation objective.</b>	Implementing VRM Class III could constrain vegetation treatments and range improvements, increasing costs.	Continued closure of acquired lands to mineral development and withdrawal of <del>6,373</del> <b>7,265</b> more acres from mineral entry would prevent impacts to upland vegetation described for Alternative 1. Utility development within the two designated corridors would potentially disturb more upland vegetation but probably to a lesser extent than under Alternative 1.
	Mining could remove or disturb upland vegetation on <del>6,373</del> <b>7,265</b> acres of public and split- estate lands, and mining infrastructure could indirectly affect more vegetation. Proliferation of utility lines and service roads without corridor designation could remove or harm upland vegetation.	Fully implementing the designated road system should minimize unauthorized roads and protect more upland vegetation than under current management. Road closures would restore <del>23.3</del> <b>20</b> acres of upland vegetation. Establishing recreation zones would limit camping-related vegetation disturbance on 4,613 acres in Zones 1 and 2. Dispersed recreation would still slightly disturb upland vegetation on 44,387 acres of public land in Zone 3. Building the Arizona Trail would disturb 4 acres of upland vegetation. Establishing a permit system would allow BLM to adjust recreation levels to ensure that upland objectives continue to be met.
	Expanding unauthorized roads due to lack of full implementation of a designated road system would remove or harm upland vegetation. Increased recreation use has increased disbursed recreation impacts, including vegetation trampling, and unplanned fire starts from vehicles, campfires, cigarettes, and arson.	Livestock would graze 42,155 acres of upland vegetation. Livestock grazing management would benefit watershed condition and function more than under Alternative 1 as described in the impacts to watershed section.
	Livestock would graze 41,855 acres of upland vegetation. Current upland vegetation condition is meeting Arizona Standards for Rangeland Health. Although overall vegetation conditions are improving under current livestock management, mesquite and brush, which are invading in response to past livestock use and fire suppression, might need to be removed through vegetation treatment.	ACEC designation would emphasize increased protection of sensitive areas, including upland vegetation, and direct more resources to achieving desired upland vegetation condition.
	Lack of ACEC designation would not provide special management for upland areas.	

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### Impacts From Alternative 3

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Mineral development would disturb upland vegetation as described under Alternative 1, but impacts could occur over a much larger area. Utility rights-of-way and land use authorizations would disturb upland vegetation as described for Alternative 2, but impacts could be greater because of the added right-of-way and associated service roads.

Impacts of OHV management would be the same as for Alternative 2. About ~~46.5~~ **14.2** acres of upland vegetation would be restored on closed roads, less than under Alternative 2. Recreation impacts on upland vegetation would be less than under Alternatives 1 or 2 because more area (17,960 acres) would be restricted to designated sites. The Arizona Trail would affect upland vegetation the same as under Alternative 2.

Livestock grazing management under Alternative 3 would allow the five allotments to meet the upland vegetation objective for most years. Livestock would graze ~~43,895~~ **45,375** acres of upland vegetation. During extended drought the risk of overstocking and overgrazing would increase because livestock management could not change as fast as field conditions might require with a fixed stocking rate. This grazing strategy might degrade vegetation and watershed if plants lose vigor because of persistent low soil moisture and continued grazing at fixed levels.

ACEC designation would affect upland vegetation much as under Alternative 1 but Alternative 3 would reduce the scope of protection by about 90% for 4,859 instead of 45,859 acres.

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### Impacts From Alternative 4

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Mineral development would affect upland vegetation the same as under Alternative 2. Utility rights-of-way and land use authorizations would affect upland vegetation as described for Alternative 2, but impacts of rights-of-way would be confined to one corridor.

Impacts of OHV management would be the same as under Alternative 2. ~~Forty~~ **About 37** acres of upland vegetation would be restored on closed roads, more than under any of the other alternatives. Recreation zones would limit camping-related vegetation disturbance on 3,270 acres in Zones 1 and 2, less than under either Alternative 2 or 3. Dispersed recreation would still slightly disturb upland vegetation on 45,730 acres of public land in Zone 3. Routing the Arizona Trail along existing roads would preclude more disturbance of upland vegetation from construction.

Livestock would no longer graze 41,855 acres, but residual effects of grazing such as changes in species composition, increases in invasive species, or increases in certain exotics would remain at least in the short term.

Impacts of ACEC designation on upland vegetation would be as described for Alternative 2.

Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>BIOLOGICAL RESOURCES</b>		
<p><b>Riparian/ Wetland Vegetation</b></p> <p><i>Scope of Analysis: Changes in riparian condition and function and ability to meet the riparian objective.</i></p>	<p>Lack of vegetation management might prevent the riparian objective from being met. Shrub invasion and decreased soil stability in the watershed could cause rapid stream adjustments from changes in peak flows. Sediment inputs would temporarily degrade riparian resources.</p> <p>No impacts from current fish and wildlife, cultural, or visual resource management.</p> <p>Large-scale mineral development on lands open to mining might prevent the riparian objective from being met. Water quality could be lowered by excess sedimentation or release of toxic materials. Water quantity could be reduced by water extraction for mining or associated development.</p> <p>The riparian objective could be met with the addition of new utilities unless they proliferate to an extent that they degrade the watershed. Increases in sedimentation and runoff from utility corridor development could be substantial, and lines crossing riparian areas could lead to bank instability and sedimentation.</p> <p>Current off-highway vehicle management generally protects riparian vegetation and stream banks and supports meeting the riparian objective. But the 11 road crossings are a source of sedimentation and harm to stream banks and riparian vegetation.</p>	<p>Implementing integrated vegetation management would improve watershed condition and benefit wetland and aquatic areas through reduced sedimentation and frequency of peak flood flows and increased groundwater recharge, which feeds springs that support riparian plant communities. Prescribed fire would pose a risk of localized short-term harm from loss of mature riparian trees if fire escaped into a riparian area.</p> <p>Fish and wildlife management would benefit riparian/ wetland areas. Securing an instream flow right would help assure the sustainability of perennial water in Cienega Creek over the long term. Restrictions on livestock and recreation use of riparian areas to protect threatened and endangered species would also protect riparian vegetation and banks. Reintroducing beaver would change stream channel geometry and vegetation, leading to expansion of marsh habitats and increased structural diversity of riparian vegetation. No impacts from cultural or visual resource management.</p> <p>Eliminating the potential for mining on public land would greatly reduce the risk of impacts, including riparian habitat degradation from sedimentation, excessive water use, and contamination described for Alternative 1. Utility corridor designation would eliminate most of the risk of direct impacts on riparian areas from new utilities that might occur under Alternative 1.</p> <p>Impacts of OHV designation would be the same as under Alternative 1, but eliminating all but one <b>concrete road stream crossing across the perennial portion of Cienega Creek and one concrete road crossing across the perennial portion of Empire Gulch</b> would alleviate the <b>associated</b> impacts of bank erosion and sedimentation.</p>

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**Impacts From Alternative 3**

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Impacts from watershed, upland, riparian, fish and wildlife, cultural, and visual resources management would be the same as under Alternative 2.

Mineral development would have more potential to degrade riparian areas than under other alternatives because more area would be open to mineral development. Utility rights-of-way and land use authorizations would affect riparian areas the same as under Alternative 2.

Off-highway vehicle management would affect riparian areas as under Alternative 1. Road closures and restrictions would affect riparian areas as described for Alternative 2 but a smaller acreage of roads would be closed and rehabilitated.

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**Impacts From Alternative 4**

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Impacts from watershed, upland, riparian, fish and wildlife, cultural, and visual resource management would be the same as described for Alternative 2.

Impacts from mineral development, utility rights-of-way, and road designations would be the same as described for Alternative 2.



Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>BIOLOGICAL RESOURCES</b>		
<p><b>Riparian/Wetland Vegetation, continued</b></p> <p><i>Scope of Analysis: Changes in riparian condition and function and ability to meet the riparian objective.</i></p>	<p>Current recreation management could disturb sensitive riparian areas if use levels increase substantially. Lack of restrictions on camping and other activities in riparian areas exposes riparian areas to impacts of dispersed recreation use. The lack of an Arizona Trail designation would not affect riparian/wetland vegetation.</p> <p>Livestock grazing management excludes livestock from most riparian areas. Increased vegetation cover, structure, and composition are leading to more stable riparian areas and potential natural communities. But livestock in crossing lanes and watering areas trample stream banks and disturb riparian vegetation.</p> <p>Lack of ACEC designation means that no specific management actions to protect sensitive wetland and aquatic areas would be prescribed.</p>	<p>Increasing recreation use in riparian areas could trample vegetation and damage stream banks. Some of these impacts would be offset by camping and vehicle restrictions in riparian areas. A recreation permit system would help ensure that use levels are compatible with maintaining riparian function and condition. The Arizona Trail would have no direct impacts.</p> <p>Livestock grazing management would likely benefit riparian areas more than under Alternative 1 due to improved watershed conditions and increased flexibility in management, allowing a more rapid response to changes in resource condition. Continued enclosure of riparian areas to livestock would allow riparian vegetation to rapidly reach its potential.</p> <p>ACEC designation would emphasize a collaborative approach to watershed management and increased protection of riparian areas, and would potentially direct more resources to the area, benefitting riparian areas.</p>
<p><b>Fish and Aquatic Wildlife (includes aquatic threatened and endangered species)</b></p> <p><i>Scope of Analysis: Changes in habitat features and populations of fish and aquatic wildlife.</i></p>	<p>Lack of integrated vegetation treatment and subsequent impacts on watershed condition might change habitats, including loss of pools from sedimentation and loss of cover from channel adjustments that would degrade aquatic habitat important to federally listed and other aquatic wildlife, including Gila topminnow, Gila chub, longfin dace, leopard frogs, and Mexican garter snake.</p> <p>Current fish and wildlife management includes consultations to reduce harm to endangered or threatened species and aquatic habitats. The Gila topminnow's range would expand to improve the status of the Cienega Creek lineage. Current cultural or visual resource management would not affect fish and aquatic wildlife.</p>	<p>Implementing integrated vegetation treatment would improve watershed condition. The result would be improved aquatic habitats due to lower sedimentation and higher channel stability, which promote high levels of instream cover, a large range of water depths and velocities, and riparian canopy cover development that tempers seasonal extremes in water temperatures. Gila topminnow, Gila chub, longfin dace, leopard frogs, Mexican garter snake, and Huachuca water umbel would all benefit. Prescribed fires could lower water quality and disturb aquatic species, but fire planning should minimize risks.</p>

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**Impacts From Alternative 3**

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Recreation management would affect riparian areas the same as under Alternative 2. The Arizona Trail would cross the riparian area through the Narrows and degrade fragile floodplain soils and damage riparian vegetation.

Livestock grazing management would have similar direct impacts to riparian areas as under Alternatives 1 and 2 because cattle would continue to be excluded. During drought, fixed stocking rates might degrade watershed condition, increasing runoff, flood peaks, and sedimentation and decreasing aquifer recharge and base flows.

90% less acreage would be designated as ACECs, but most riparian areas would be included and protected by special management.

Impacts from watershed, upland, riparian, fish and wildlife, cultural and visual resources management would be the same as described for Alternative 2.

Mineral development would have greater potential to disturb fish and aquatic wildlife and plants than under the other alternatives because more area would be open to mineral development. Utility rights-of-way and land use authorizations would affect fish and aquatic wildlife and plants the same as under Alternative 2.

Management of off-highway vehicles would affect fish and aquatic wildlife and plants as described for Alternative 1. Road closures and restrictions would affect fish and aquatic wildlife and plants as described for Alternative 2, but a smaller acreage of roads would be closed and rehabilitated.

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**Impacts From Alternative 4**

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Impacts recreation management and the Arizona Trail would be the same as described for Alternative 2.

Eliminating livestock grazing on public land under Alternative 4 would affect riparian areas in much the same way as under the other alternatives. Livestock management under the other alternatives would virtually eliminate direct cattle impacts to riparian areas through exclosure. Alternative 4 would further eliminate impacts from crossing lanes and watering areas and from trampling around livestock developments. Possible improvements in watershed health could slightly lower peak flows and sedimentation and increase infiltration, aquifer recharge, and duration and length of perennial flow.

ACEC designation would affect riparian areas the same as under Alternative 2.

Impacts from watershed, upland, riparian, fish and wildlife, cultural, and visual resource management would be the same as described for Alternative 2.

Impacts from mineral development, utility rights of ways, and road designations would be the same as described for Alternative 2.

Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>BIOLOGICAL RESOURCES</b>		
<p><b>Fish and Aquatic Wildlife, continued (includes aquatic threatened and endangered species)</b></p>	<p>The aquatic habitat portion of the riparian objective might not be met if a large-scale mineral development occurs. Extraction of water for large-scale mining would reduce aquatic habitat for native fishes and aquatic wildlife and plants, including Gila topminnow, Gila chub, longfin dace, leopard frogs, Mexican garter snake, and Huachuca water umbel through sedimentation, excessive water use, and contamination.</p>	<p>Fish and wildlife management proposals would place added emphasis on protecting and restoring aquatic fish and wildlife habitats and populations. Aquatic wildlife, including the desert pupfish, Gila topminnow, Gila chub, lowland leopard frog, and Chiricahua leopard frog, would be conserved by reintroductions and other management. Securing an instream flow right would help assure the sustainability of perennial water in Cienega Creek needed by aquatic species over the long term. Added restrictions on livestock and recreation use of riparian areas would protect aquatic species, including the special status species mentioned above. Reintroducing beaver would expand marsh habitats and increase aquatic habitat diversity. Cultural or visual resource management would not affect fish and aquatic wildlife.</p>
<p><b>Scope of Analysis: Changes in habitat features and populations of fish and aquatic wildlife.</b></p>	<p>Construction for utilities might slightly to moderately disturb habitats of federally listed and other fish and aquatic wildlife and plants as mentioned above for mineral development.</p>	<p>Eliminating the potential for mining on public land would greatly reduce the risk of harm to aquatic habitats described for Alternative 1. Utility corridor designation would eliminate most of the risk of direct impacts on fish and aquatic wildlife and plants from new utilities described for Alternative 1.</p>
	<p>OHV designation should allow the aquatic habitat objective to be met and protect habitats of federally listed and other aquatic wildlife and plants mentioned above. But vehicles using 11 stream crossings could crush and therefore kill or injure animals, disturb habitats by sedimentation, lower water quality by leaking oil or other fluids, provide access for introduction of exotic species, destroy vegetation cover, and reduce bank stability.</p>	<p>Impacts of OHV designation would be the same as under Alternative 1, but eliminating all but one road stream crossing would alleviate the impacts on aquatic species described for Alternative 1. Recreation use in riparian areas including horseback riding and hiking, could increase injury or mortality to Gila topminnow, and harass or injure leopard frogs and garter snakes. Impacts to water quality, stream banks, and vegetation cover from recreational use could also disturb aquatic species. The Arizona Trail could contribute to these impacts by attracting more visitors. A recreation permit system would help ensure that use levels are compatible with maintaining aquatic habitats and populations of aquatic species.</p>
	<p>Current recreation management might disturb aquatic habitats and animals and plants. Increasing recreation use could reduce bank stability and vegetation cover along streams, promoting erosion and filling pool habitats. Extensive bank damage could adjust stream channels. Equestrian or hiking use could kill topminnows. Lack of an Arizona Trail designation would not affect fish and aquatic wildlife.</p>	

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**Impacts From Alternative 3**

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Recreation management would affect fish and aquatic wildlife and plants much as under Alternative 2. But the Arizona Trail would cross the riparian area through the Narrows and allow direct impacts to fish and aquatic wildlife, including injury or death to Gila topminnow, harassment of leopard frogs, Gila chub, and Mexican garter snake, damage to vegetation cover, and trampling of stream banks.

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**Impacts From Alternative 4**

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Impacts from recreation management and the Arizona Trail would be the same as described for Alternative 2.

Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>BIOLOGICAL RESOURCES</b>		
<p><b>Fish and Aquatic Wildlife, continued (includes aquatic threatened and endangered species)</b></p>	<p>Aquatic habitat components, including woody cover, undercut banks, average pool depth, and overhanging cover, are increasing under current livestock management with limited access to streams. Localized areas might experience trampling of vegetation and banks, lowering of water quality from fecal material, and for Gila topminnow the risk of ingestion by watering cattle.</p>	<p>Livestock grazing management would have impacts similar to those under Alternative 1. The expanded biological planning process should further help protect aquatic fish and wildlife through increased monitoring and improved watershed condition. ACEC designation would provide for important protective management to fish and aquatic wildlife and enhance resources for management and protection.</p>
<p><i>Scope of Analysis: Changes in habitat features and populations of fish and aquatic wildlife.</i></p>	<p>Lack of ACEC designation could deny important protective management to fish and aquatic wildlife.</p>	<p>ACEC Designation would provide protective management on a watershed scale which would benefit habitats for fish and aquatic wildlife.</p>
<p><b>Terrestrial Wildlife (Includes terrestrial threatened and endangered species)</b></p>	<p>Lack of integrated vegetation treatment over the long term would increase shrub-invaded grasslands and decrease open grassland habitats. Terrestrial wildlife preferring shrub grasslands, such as white-tail deer, would benefit. Habitat for species preferring open grassland, like pronghorn, Baird's and grasshopper sparrows, would decline.</p>	<p>Vegetation treatments would tend to favor species that prefer open habitats and result in reduced occupation by species that favor dense cover usually found in mesquite or desert shrub habitat. Prescribed fires might destroy habitat in the short term and kill slow-moving species. Pronghorn would benefit from new growth after fires. Fires would also destroy some agaves, which are forage for endangered lesser long-nosed bats. Species such as Baird's sparrow and grasshopper sparrow would benefit unless nonnative species (such as Lehmann's lovegrass) increase. Actions to protect riparian areas would benefit riparian-dependent wildlife, including the endangered southwestern willow flycatcher and many sensitive species such as the yellow-billed cuckoo.</p>
<p><i>Scope of Analysis: Changes in habitat features and populations of terrestrial wildlife.</i></p>	<p>Current wildlife management, including threatened and endangered species consultations, studies, habitat improvement projects, and reestablishing species on a case-by-case basis, benefits terrestrial wildlife. Implementing conditions of biological opinions benefits jaguar, willow flycatcher, and lesser long-nosed bat.</p>	<p>Proposals for reestablishing or supplementing wildlife populations would benefit extirpated wildlife species such as the endangered aplomado falcon if actions are found feasible and are successful. Other wildlife management proposals would create a mosaic of habitats, protect sensitive areas, and facilitate wildlife movement.</p>
	<p>Cultural resource data recovery might disturb a small amount of terrestrial habitat. Management for VRM Class III might require stipulations that slightly increase wildlife project costs.</p>	<p>Cultural resource management would attract a higher level of human use to Empire Ranch</p>

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### Impacts From Alternative 3

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Livestock grazing management would have similar direct impacts on fish and aquatic wildlife and plants as described for Alternatives 1 and 2. Cattle would continue to be excluded from streams, but would cause damage at crossing lanes and watering areas. Fixed stocking rates might degrade watershed condition during drought; increase runoff, flood peaks, and sedimentation; and decrease aquifer recharge and base flows affecting habitats of fish and aquatic wildlife and plants.

Although Alternative 3 would designate 90% less acreage in ACECs, most riparian areas that provide aquatic habitats would be included and protected by special management.

Watershed, upland, riparian, wildlife, and cultural resource management would affect terrestrial wildlife the same as under Alternative 2.

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### Impacts From Alternative 4

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Eliminating livestock grazing on public land would affect fish and aquatic wildlife and plants in much the same way as the other alternatives. Livestock management under the other alternatives would virtually eliminate direct cattle impacts through riparian area exclosure of most areas. Alternative 4 would further eliminate impacts from crossing lanes and watering areas. Added improvements in watershed health might benefit aquatic habitats by slightly decreasing peak flows and sedimentation and increasing infiltration, aquifer recharge, and duration and length of perennial flow.

ACEC designation would affect fish and aquatic wildlife and plants the same as under Alternative 2.

Impacts of watershed, upland, riparian, wildlife, and cultural resource management, and mineral development would be as described for Alternative 2.

Impacts on terrestrial species would be similar to those described for Alternative 2 except the potential to maintain habitat quality, reduce habitat loss, and maintain viable wildlife populations on public land in the planning area would be enhanced by removing livestock, designating only one utility corridor, and closing or restricting a larger proportion of roads (20%).

Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>BIOLOGICAL RESOURCES</b>		
<p><b>Terrestrial Wildlife, continued</b></p> <p><b>(Includes terrestrial threatened and endangered species)</b></p> <p><b>Scope of Analysis: Changes in habitat features and populations of terrestrial wildlife.</b></p>	<p>Potential mineral development on <del>6,373</del> <b>7,265</b> acres would destroy or degrade oak woodland habitat, harming species such as Mearn's quail, white-tailed deer, and lesser long-nosed bat. Associated vehicles and human presence might disrupt or kill terrestrial wildlife</p> <p>In the long term proliferating rights-of-way might significantly disturb wildlife. Utility lines and access roads could block wildlife movement. Increased human use could result in mortality from vehicles, poaching, and habitat destruction.</p> <p>Off-highway vehicle use would disturb or destroy habitat, kill animals, promote poaching, and disturb wildlife use patterns. ORV might destroy some agaves essential to lesser long-nosed bats. Vehicles at the 11 stream crossings would destroy or disturb vegetation cover in riparian areas for about 1/4 mile up and down stream, harming willow flycatchers.</p> <p>Livestock would forage on 41,855 acres of oak woodland and grassland habitat, reducing cover and forage for grassland species. Trampling would further reduce cover, particularly around livestock developments. Habitat conditions would improve for species that benefit from increased bare ground. Livestock would consume some growing agave stalks, disturbing lesser long-nosed bat foraging habitat. Grazing of small areas of riparian habitat in crossing lanes and watering areas would harm willow flycatchers, as would livestock developments that attract cowbirds.</p>	<p>Continued closure of acquired lands to mining and proposed withdrawal of open areas would virtually eliminate the harm of mineral development to wildlife as described for Alternative 1. Designating two utility corridors would limit impacts described for Alternative 1 to a potentially much smaller area.</p> <p>Road designations and closing <del>14</del> <b>12</b>% of the road network would reduce motorized recreation impacts described for Alternative 1. Seasonal road closures would benefit pronghorn. Designating recreation zones would increase levels of human disturbance at designated sites in Zones 1 and 2. Camping-related disturbance would end in Zone 1. Dispersed recreation impacts would decline but would still occur on 90% of public land. A permit system would help ensure that recreation use is compatible with sustaining wildlife habitats and populations.</p> <p>Livestock would forage on 42,155 acres of oak woodland and grassland habitats and would affect wildlife as under Alternative 1. But flexible stocking rates and a more structured biological planning process should enhance wildlife management and better protect habitats. Grazing would still disturb the endangered southwestern willow flycatcher and lesser long-nosed bat as described for Alternative 1.</p>

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### Impacts From Alternative 3

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### Impacts From Alternative 4

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Mineral development would affect wildlife as under Alternative 1, but harm could occur over a much larger area since 74% more acres would be open to mining for locatable minerals and 84% more acres would be open to mineral leasing. Designating utility corridors would have similar impacts as under Alternative 2, but impacts would occur in one added corridor.

Designating and closing roads would have impacts similar to those described for Alternative 2, but 8.6% instead of 14.12% of the road network would be closed. Added group sites and camp areas would increase impacts of human disturbance at these designated sites. But less acreage would be designated for dispersed use, so those impacts would occur on 63% of public land.

Livestock would forage on 43,895 **45,375** acres of oak woodland and grassland habitat and have similar impacts as described for Alternative 1. But in favorable or normal rainfall years, the impacts of reduced cover should be less due to conservative fixed stocking rates. In unfavorable drought years, loss of cover for wildlife and decline in vegetation condition could be greater than under Alternatives 1 and 2, where livestock numbers would be adjusted. Livestock grazing would still harm the endangered southwestern willow flycatcher and the lesser long-nosed bat as described for Alternative 1.

Dispersed recreation impacts would be most similar to Alternative 1 because Alternative 4 would include the most area in Zone 3.

The endangered southwestern willow flycatcher and lesser long-nosed bat would still be affected, mainly by the impacts of recreation use.



Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>BIOLOGICAL RESOURCES</b>		
<p><b>Noxious Weeds and Invasive Plants</b></p> <p><i>Scope of Analysis: Risk of invasion or spread of noxious weeds or invasive species.</i></p>	<p>Noxious weeds could be introduced and invasive species could be introduced or spread from both concentrated and dispersed recreation and from livestock operations.</p> <p>Motor vehicles on roads could spread some noxious weeds or promote spread of invasive species such as Lehmann's lovegrass.</p>	<p>Noxious weeds could be introduced and invasive species could be introduced or spread from both concentrated and dispersed recreation and from livestock operations.</p> <p>Establishing a noxious weed and invasive species control area would increase opportunities to acquire funding for control or eradication.</p> <p>Reduced miles of road for motor vehicle use would slightly reduce the risk of introducing or spreading certain noxious weeds and invasive species.</p> <p>Integrated vegetation treatment, including prescribed fire, could help control some noxious weeds but spread others and could promote certain invasive species such as Lehmann's lovegrass. BLM would consider these factors in project design and mitigation.</p>
<b>VISUAL RESOURCES</b>		
<p><b>Visual Resources</b></p> <p><i>Scope of Analysis: Changes in the quality of visual resource conditions in the viewshed.</i></p>	<p>Future mineral or right-of-way development could degrade the planning area's current high scenic quality. Unauthorized off-road vehicle travel (wildcat roads), spread of concentrated and dispersed recreation impacts (bare ground, hardened areas) and some livestock developments could also lower scenic quality.</p> <p>Current watershed restoration projects could lower scenic quality in the short term but would improve scenic quality over the long term.</p> <p>Applying VRM Class III standards to all developments and projects would help protect scenic quality.</p>	<p>Current high scenic quality would be retained by closure to mineral development, designating corridors along existing utility lines, implementing a designated road system, and restricting camping in Zones 1 and 2.</p> <p>Proposed watershed restoration projects, including vegetation treatments, could lower scenic quality in the short term but improve scenic quality over the long term.</p> <p>Applying VRM Class II standards to all developments and projects would increase protection of scenic quality from that under Alternative 1.</p>

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**Impacts From Alternative 3**

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**Impacts From Alternative 4**

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Impacts would be the same as under Alternative 2.

Impacts would be the same as under Alternative 2, but the removal of livestock would reduce one risk factor in introducing or spreading noxious weeds **and invasive species**. Further reduction in miles of roads for motor vehicle use would slightly reduce the risk of spreading certain noxious weeds compared to Alternative 2.

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Current high scenic quality could be lowered by mineral development outside ACECs.

Current high scenic quality would be retained by designating corridors along existing utility lines and implementing a designated road system and restrictions on camping in Zones 1 and 2.

Applying VRM Class II standards to all developments and projects would increase protection of scenic quality from that under Alternative 1.

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Current high scenic quality would be retained by closures to mineral development, designating corridors along existing utility lines, removing livestock grazing and developments from public land, and restricting camping in Zones 1 and 2. Increased fencing would slightly degrade visual resources.

Applying VRM Class II standards to all developments and projects would increase protection of scenic quality from that under Alternative 1.

Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>CULTURAL AND PALEONTOLOGICAL RESOURCES</b>		
<p><b>Cultural and Paleontological Resources</b></p> <p><i>Scope of Analysis: Potential for disturbance to or for increased protection of cultural and paleontological resources resulting from proposed actions.</i></p>	<p>Current watershed, vegetation, and wildlife management provides limited and localized benefits to cultural resources from restoration and/or management activities.</p> <p>Current management of visual resources (VRM Class III) allows some undesirable visual intrusions at historic ranch headquarters.</p> <p>Current cultural resource management provides basic stabilization and limited protection of cultural resources. Class III surveys and ethnoecology study would enhance knowledge base. Providing Native American plant collecting sites meets a need.</p> <p>Continued closure of most public land to mining would protect cultural resources. Mining impacts from small acreages open to mining could be mitigated.</p> <p>Lack of designated utility corridors could disturb cultural resources over a wide area, but data recovery could mitigate impacts.</p> <p>Unauthorized off-road travel by vehicles seriously threatens cultural resource sites. The threat of illegal collecting of cultural and paleontological resources is enhanced by the existing road network, which provides access to sites. Class III surveys along roads would help assess threats.</p> <p>Lack of recreation zones would disturb cultural resources through unregulated, dispersed recreation.</p>	<p>Proposed watershed, vegetation, and wildlife management would improve plant cover, better protecting cultural sites. Restrictions on uses in riparian areas would benefit cultural resources, which are concentrated in these areas.</p> <p>Management of visual resources under Class II would protect and enhance scenic quality of historic ranch headquarters.</p> <p>Cultural resource management that provides basic stabilization and adaptive reuse would give the public and scientific community a wide array of educational, interpretive, and research opportunities at the Empire Ranch Headquarters and sites outside the headquarters area. Class III surveys and ethnoecology studies would enhance the knowledge base. Providing Native American plant collecting sites meets a need.</p> <p>Designated utility corridors would restrict cultural resource impacts from ground disturbance to limited areas. Disturbance could be mitigated by data recovery.</p> <p>Unauthorized off-road travel by vehicles could be better enforced by fully implementing a designated road system. Proposed road restrictions and closures would protect some cultural sites and slightly reduce the threat of illegal collecting of cultural and paleontological resources</p> <p>The Arizona Trail designation could disturb cultural resources by providing non-motorized access into new areas. Data recovery could mitigate Impacts.</p> <p>Designating recreation zones would protect cultural resources in Zones 1 and 2 from most concentrated use because activities would be restricted to designated sites where impacts could be mitigated.</p>

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**Impacts From Alternative 3**

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Impacts would be the same as under Alternative 2 with the following exceptions:

Opening the planning area to mining outside ACECs could inflict major harm to cultural resources. These impacts would have to be mitigated through mining plans of operations.

Smaller ACECs would still protect cultural resources, which are concentrated along riparian areas within the ACECs.

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**Impacts From Alternative 4**

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Impacts would be the same as under Alternative 2 with the following exceptions:

The impacts from livestock grazing and developing range projects would be eliminated.

Additional roads would be closed and restricted, further reducing the impacts of motorized recreation.

Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>CULTURAL AND PALEONTOLOGICAL RESOURCES</b>		
<p><b>Cultural and Paleontological Resources continued</b></p> <p><i>Scope of Analysis: Potential for disturbance to or for increased protection of cultural and paleontological resources resulting from proposed actions.</i></p>	<p>Livestock grazing would inflict only limited damage to cultural resources because livestock would be fenced from riparian areas where cultural resources are concentrated.</p> <p>Lack of ACEC designations would preclude management prescriptions that might benefit cultural and paleontological resources.</p>	<p>Livestock grazing impacts would be same as under Alternative 1.</p> <p>ACEC designation would protect cultural resources through associated actions to protect vegetation and wildlife.</p>
<b>LAND USES</b>		
<p><b>Lands and Realty</b></p> <p><i>Scope of Analysis: Impacts on the ability to permit land use authorizations and provide services.</i></p>	<p>No utility corridors would be designated for new applications. BLM would consider locations and applications on case-by-case basis.</p> <p>Protecting sensitive resources, including threatened and endangered species and cultural sites, might preclude project approvals or locations or require stipulations that increase project costs.</p>	<p>Two designated utility corridors could be used for new applications. Such use might reduce some of the conflicts relating to cultural properties and sensitive or listed plants or animals.</p> <p>Protecting sensitive resources, including threatened and endangered species and cultural sites, might preclude project approvals or locations or require stipulations that increase project costs. Reintroducing species could require more stipulations.</p> <p>Vegetation treatments, including prescribed fire, could harm right-of-way facilities and preclude land use authorizations. Protective measures would need to be applied.</p> <p>Motorized recreation use along utility easements could result in conflicts with permit holders.</p> <p>The construction and use of the Arizona Trail and use of other non-motorized routes could result in conflicts where the trail crosses existing access routes for utilities and other land use permit sites.</p>

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**Impacts From Alternative 3**

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**Impacts From Alternative 4**

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see page 2-157

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see page 2-157

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Impacts would be the same as under Alternative 2 except three designated utility corridors could be used for new applications.

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Impacts would be the same as under Alternative 2 except only one designated utility corridor could be used for new applications.

Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>LAND USES</b>		
<p><b>Mineral Development</b></p> <p><i>Scope of Analysis: Acreage open to potential mineral exploration and development.</i></p>	<p>48,542 acres of public land would remain closed to mineral location and mineral leasing. 458 acres of public land and 5,914.6 7,167 acres of split-estate lands would remain open to mineral location and mineral leasing. 49,000 acres of public land and 5,914.6 7,167 acres of split-estate lands would be closed to mineral material sales.</p> <p>About 88% of the federal mineral estate in the planning area would be closed to mineral location and leasing. Overall, about 40% of planning area prospectively valuable for oil and gas would be open, and 60% would be closed. Planning area includes about 0.5% of area in southeast Arizona that is prospectively valuable for oil and gas.)</p> <p>Overall, 65% of the planning area would be open to mining either on federal mining claims or state leases, and 35% would be closed.</p>	<p>Same as under Alternative 1 but 458 more public domain acres and 5,914.6 7,167 more split-estate acres would be proposed to be withdrawn from mineral location and leasing.</p> <p>A 12% reduction in public land open to mineral leasing and location.</p> <p>Overall, about 30% of planning area (federal and state) prospectively valuable for oil and gas would be open and 70% would be closed.</p> <p>Only State Trust Lands in the planning area would potentially be open to mining of locatable minerals.</p>

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**Impacts From Alternative 3**

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**Impacts From Alternative 4**

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41,000 acres of public land and 5,914.6 **7,167** acres of split-estate lands would be open to mineral location and mineral material sales outside ACECs. 45,859 acres of public land and 5,914.6 **7,167** acres of split-estate lands would be open to mineral leasing with the stipulation of no surface occupancy within ACECs.

An 84% increase in federal lands open to mineral leasing and a 74% increase in federal lands open to mineral location in the planning area.

Overall, about 96% of planning area (federal and state) prospectively valuable for oil and gas would be open and 4% would be closed.

Overall, about 95% of planning area (federal and state) would be open to mining.

Acreage open to potential mineral exploration and development would be the same as under Alternative 2.



**Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan**

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>LAND USES</b>		
<b>Livestock Grazing</b>	BLM would continue to authorize livestock grazing on 41,855 public land acres.	BLM would authorize livestock grazing on 41,155 public land acres.
<b>Scope of Analysis: Acreage open to livestock grazing, allowable use levels, and other constraints.</b>	<p>Four grazing allotments would continue to operate. The Empire-Cienega allotment would have variable net cash returns, resulting in part from the variable stocking rate and resulting in variable grazing receipts to BLM.</p> <p>Protection of sensitive resources, including riparian areas, special status wildlife and plants, and cultural resources, might constrain grazing management and increase operating costs.</p> <p>Improvements in upland vegetation condition from vegetation treatments would be localized and unlikely to measurably increase forage base.</p> <p>Unmanaged increases in recreation use would threaten viability of livestock operations and require increased labor and capital outlay from ranchers. Direct human-livestock conflicts eventually could end the viability of grazing operations.</p> <p>Over the long term, less grazing land (State Trust and private) might be open to livestock operations due to shifts from a rural agriculture-based economy to residential and service-related ecotourism economy.</p>	<p>Four grazing allotments would continue to operate, and one new allotment would be established in the Empire Mountains.</p> <p>All allotments would have variable net cash returns resulting in part from variable stocking rates and resulting in variable grazing receipts to BLM. A new grazing allotment in the Empire Mountains could generate personal income of more than \$1,700 and \$300 in grazing receipts to BLM.</p> <p>Protection of sensitive resources, including riparian areas, special status wildlife and plants, and cultural resources, might constrain grazing management and increase operating costs. Reintroduced species might additionally constrain grazing management.</p> <p>Improvements in upland vegetation condition from integrated vegetation treatments are likely to increase the forage base over the long term.</p> <p>Increased recreation use would threaten the viability of livestock operations, and livestock and visitors would directly conflict. But proposed recreation management and use of the biological planning process should reduce and resolve these conflicts and improve prospects for maintaining viable grazing operations. Some road closures or restrictions might slightly lower the efficiency of grazing operations. Conflicts might temporarily increase in areas of designated recreation sites or the Arizona Trail.</p> <p>Acquisitions of more public land or conservation easements might help ensure that more grazing land is open to grazing operations for a longer period</p>

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**Impacts From Alternative 3**

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**Impacts From Alternative 4**

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Same as Alternative 2 except for the following:

BLM would authorize Livestock grazing on ~~45,095~~  
**45,375** public land acres.

Allotments would have lower but set stocking rates. Therefore net cash returns would be more stable. Over the long term, income from operations might be lower on average. A new grazing allotment in the Empire Mountains could generate \$300 in grazing receipts to BLM and personal income exceeding \$1,700.

To resolve conflicts between users BLM would apply more traditional methods instead of the biological planning process.

BLM would not allocate public land for livestock grazing.

Four federal grazing leases would be cancelled, affecting operations on four ranches.

More than \$129,000 in personal income could be lost. No federal grazing receipts would be received on the four allotments.

BLM might have to compensate ranchers for the value of improvements that they would no longer use.

Increasing recreational use would continue, but livestock operations would no longer conflict with visitors on public land.

Over long term, less grazing land (State Trust and private) might be open to other livestock operations surrounding these public lands because of shifts from a rural agriculture-based economy to a residential and service-related ecotourism economy.

**Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan**

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>LAND USES</b>		
<p><b>Recreation</b></p> <p><i>Scope of Analysis: Changes in recreation opportunity settings ; corresponding changes in recreation experiences and changes in access.</i></p>	<p>Existing recreation settings would be adversely affected by the following:</p> <ul style="list-style-type: none"> <li>• Lack of planned and integrated vegetation management.</li> <li>• Management as VRM Class II, which allows some changes to existing landscape character.</li> <li>• Deterioration of historic buildings, which leads to loss of site character.</li> <li>• Lack of a comprehensive cultural resource interpretation program.</li> </ul> <p>Current wildlife management enhances recreation opportunities and settings.</p> <p>Mineral development on public land now open to mining could result in loss of more primitive recreation experiences and scenic qualities and changes in visitor access. Utility rights-of-way and land use authorizations on public land could change current recreation opportunities and visitor access. Both uses could result in subsequent increases in motorized traffic, increases in the use of unauthorized public land access points, changes in some road conditions, and increases in road maintenance requirements.</p> <p>Current off-highway vehicle management has disturbed the natural and more primitive recreation settings and opportunities because of the harm of unauthorized off-road travel.</p> <p>Lack of designated recreation zones and associated management allows for continual random campsite creation and dispersed recreational use on the entire planning area, harming both recreation settings and opportunities for some users in some areas. Management is complicated by lack of established desired recreation settings and opportunities. Over the long term, all visitor opportunities and experiences might change with increased, relatively unplanned recreation use.</p>	<p>Proposed actions for watershed, upland, riparian, fish and wildlife, and cultural resource management would enhance overall recreation settings and opportunities. Specific proposals would both harm and benefit recreation opportunities and settings. Designation as VRM Class II would help maintain the desired recreation opportunities and settings, including a more natural appearing and primitive recreation setting. Complying with VRM Class II prescriptions would restrict or modify some recreation developments.</p> <p>Potential impacts from mineral development would be eliminated and impacts from utility rights-of-way would be confined to two corridors.</p> <p>Implementing OHV designation and transportation system would create a wider variety of both motorized and no-motorized recreation opportunities and reduce user conflicts. Establishing an individual recreation permit system would help preserve existing recreation settings and opportunities by addressing the area's recreation capacities. The proposed recreation zone prescriptions would help maintain recreation settings and enhance recreation opportunities.</p>

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**Impacts From Alternative 3**

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Same impacts as Alternative 2 from watershed, riparian and upland vegetation, fish and wildlife, and cultural resource management and from VRM Class II designation.

Impacts from mineral development would be the same as described for Alternative 1 but could occur on a much larger scale. Impacts of utility rights-of-way would be similar to those under Alternative 2 but would be expanded into another corridor.

Impacts of off-highway vehicle management would be the same as under Alternative 2.

Recreation impacts would be similar to those described for Alternative 2 except that the Zone 2 and 3 configuration would maintain a more natural or primitive corridor on the main touring road heading northeast through the planning area. Since camping along the road corridors in an expanded Zone 2 would not be allowed unless at a designated spot, negative impacts along the roadside would decline. An overall high visual quality and sense of being in a more primitive area would be maintained.

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**Impacts From Alternative 4**

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Impacts would be the same as under Alternative 2 except for the following:

Impacts of utility rights-of-way would be confined to one corridor.

No exclusively non-motorized routes would be created. That all routes would be shared motorized and non-motorized use would likely increase user conflicts.

Desired recreation settings might be harder to maintain if visitor use increases dramatically because most of the area is prescribed for dispersed recreation use and the least amount of area is in the more restrictive Zones 1 and 2 (designated camp areas, group areas, and pullouts for example).

**Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan**

<b>Resource Affected</b>	<b>Impacts From Alternative 1 (Current Management)</b>	<b>Impacts From Alternative 2 (Agency Preferred)</b>
<p><b>Recreation, continued</b></p> <p><i>Scope of Analysis: Changes in recreation opportunity settings ; corresponding changes in recreation experiences and changes in access</i></p>	<p>Lack of an Arizona Trail designation means that a highly desired non-motorized trail would not be routed on public land in the planning area and another route would have to be found. The trail would also not attract an increasing number of visitors to the planning area.</p> <p>Livestock grazing has relatively little impact on recreation. Safety and health issues could arise when cattle and visitors use the same areas. Depending on visitor perspectives, cattle could either detract from or add to recreational experiences. Visitors often use livestock developments, including cattle trails, water sources, and corrals.</p> <p>Lack of more ACEC designations might slightly lower the quality of the recreation opportunity settings because sensitive resources might be at greater risk of degradation.</p>	<p>Designating a corridor for the Arizona Trail would provide a highly desired non-motorized trail and help reduce user conflicts on shared motorized and non-motorized routes. The trail would attract increasing numbers of visitors to the area.</p> <p>Grazing impacts would be similar to those under Alternative 1 except that users would be brought into the biological planning process, which should help reduce conflicts.</p> <p>ACEC designation would help maintain primitive and semiprimitive recreation opportunities and settings by maintaining and protecting sensitive resources in these areas.</p>
<b>SPECIAL DESIGNATION AREAS</b>		
<p><b>Wild and Scenic Rivers</b></p> <p><i>Scope of Analysis: Impacts to the resources and character of the wild and scenic river study area.</i></p>	<p>Existing watershed, vegetation, fish and wildlife, and cultural resource management would continue to protect the wild and scenic river study area and values. A Class III VRM designation could allow for some intrusions on the current scenic values of Cienega Creek.</p> <p>Disturbance from any large-scale mining in the Empire Mountains could degrade wild and scenic river values and would be mitigated through the required mining plans of operations. Rights-of-way in the wild and scenic river corridor could degrade outstandingly remarkable values.</p> <p>Continuing use of all existing roads might degrade portions of Cienega Creek where vehicle traffic is now being allowed in the wild and scenic river corridor.</p>	<p>The overall prescriptions for watershed, upland, and riparian areas would help retain Cienega Creek in wild and scenic river suitability status. Overall the cultural resource program would enhance wild and scenic river values. The more stringent VRM Class II designation would better maintain values of the river study area.</p> <p>Proposed mineral withdrawals and continued closure of most of the planning area to mineral development would protect wild and scenic river values. Designating utility corridors away from the wild and scenic river corridor would help maintain wild and scenic river values. But the proposed utility corridor in the northeast corner of the planning area would cross the Cienega Creek wild and scenic river corridor, and other lines within this corridor could degrade the scenic values of the wild and scenic river study area.</p> <p>Implementing the designated road system would reduce the potential for expanding illegally created roads and help maintain wild and scenic river values. Proposed road closures would reduce unneeded roads in the wild and scenic river corridor and eliminate almost all wet stream crossings.</p>

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**Impacts From Alternative 3**

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**Impacts From Alternative 4**

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Impacts of the Arizona Trail would be the same as under Alternative 2.

Livestock grazing impacts would generally be similar to those described for Alternatives 1 and 2. But negative impacts to recreation settings could increase in drought years if stocking rates are not reduced. Impacts to the recreational settings could include bare soil in camping areas.

Designating ACECs would have the same impacts as under Alternative 2.

Because the Arizona Trail would be shared use, motorized and non-motorized user conflicts would increase

Removal of livestock grazing might increase recreation use. Although conflicts from cattle grazing would decline, conflicts between equestrians and other users would remain. Corrals, water sources, and trails created by cattle might remain and be used by visitors, but BLM would assume maintenance costs.

Equestrian impacts could replace livestock grazing impacts on a smaller scale with higher impacts concentrated in popular areas. Increased opportunities for livestock-related and general special recreation permits would result.

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Impacts would be the same as under Alternative 2 with the following exceptions:

Mineral development impacts would be of the same type as under Alternative 1 but could occur over a much greater area.

Recreation impacts would be similar to those under Alternative 2, but some of the wild and scenic river corridor would fall in recreation Zone 2, which might better protect wild and scenic river values by restricting camping to designated areas. But because Alternatives 2, 3, and 4 would all restrict camping to areas more than 100 feet from the stream, the increased protection would be minor.

The Arizona Trail corridor would pass through the wild and scenic river corridor and might conflict with maintaining wild and scenic river values in the segment crossing through the Narrows.

Impacts would be the same as under Alternative 2 except for the following:

Eliminating livestock grazing in the river corridor would benefit wild and scenic river values, but recreational livestock use might increase and have impacts similar to livestock grazing.

Table 2-32, continued. Comparison of Impacts, Las Cienegas Resource Management Plan

Resource Affected	Impacts From Alternative 1 (Current Management)	Impacts From Alternative 2 (Agency Preferred)
<b>SPECIAL DESIGNATION AREAS</b>		
<p><b>Wild and Scenic Rivers, continued</b></p> <p><i>Scope of Analysis: Impacts to the resources and character of the wild and scenic river study area.</i></p>	<p>Lack of recreation management zones would not affect the character of the wild and scenic river corridor or its outstandingly remarkable values. Lack of designation of a route for the Arizona Trail would prevent attracting a cumulatively large number of hikers to the river corridor.</p> <p>Restricting cattle from most of the wild and scenic river corridor would help protect wild and scenic river values. Use of livestock crossing lanes and watering areas would cause some harm to wild and scenic river values.</p> <p>Lack of an ACEC designation should not affect a stream's suitability because wild and scenic river interim management guidelines already protect the study corridor's values and character.</p>	<p>The recreation Zone 3 designation recommended for the wild and scenic river study corridor would allow dispersed camping, but Alternatives 2, 3, and 4 would ban camping within the riparian zone. Despite this restriction, wild and scenic river segments within Zone 3 might be degraded by dispersed recreation use, including human waste accumulation, lowered water quality, and extensive tree damage. The lack of alternate potable water sources could have cumulative impacts to the creek where hikers and horseback riders trample vegetation to retrieve water. Designating the Arizona Trail could increase visitor use and adverse impacts.</p> <p>Livestock Grazing impacts would be the same as under Alternative 1.</p> <p>The ACEC designation would add a layer of importance, perhaps pulling in more management dollars to the area and helping retain wild and scenic river values.</p>
<p><b>ACECs</b></p> <p><i>Scope of Analysis: Impacts to the resources of the ACECs.</i></p>	<p>For all alternatives, see the impacts to watershed, upland and riparian vegetation, and fish and wildlife for the impacts to the resources of the Appleton-Whittell ACEC.</p> <p>The resources and research use of Appleton-Whittell ACEC are being protected through implementation of the proposed management for this ACEC prescribed in the Phoenix RMP and through the existing cooperative management agreement.</p>	<p>Changing the name of Appleton-Whittell ACEC to Appleton-Whittell Research Natural Area ACEC would better communicate the main purpose of the ACEC. Restricting all roads on public land in the ACEC to administrative use would ensure that unauthorized motor vehicle use does not interfere with ongoing research.</p>

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**Impacts From Alternative 3**

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**Impacts From Alternative 4**

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See page 2-167.

See page 2-167.

Impacts would be the same as under Alternative 2.

Impacts would be the same as under Alternative 2.



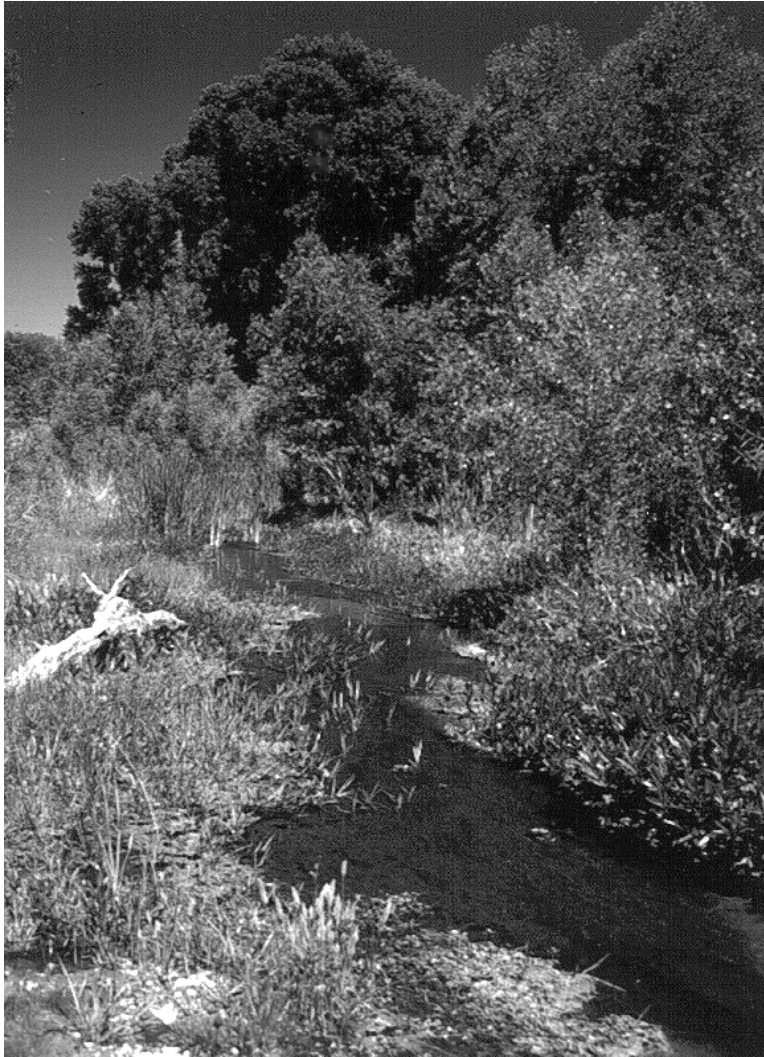
**Table 2-32, concluded. Comparison of Impacts, Las Cienegas Resource Management Plan**

<b>Resource Affected</b>	<b>Impacts From Alternative 1 (Current Management)</b>	<b>Impacts From Alternative 2 (Agency Preferred)</b>
<b>SOCIAL AND ECONOMIC CONCERNS</b>		
<b>Population and Demographics</b>	Population or demographics would not change.	Increased recreation resulting from changes in recreation management would increase the number of visitors to the planning area but not the population and demographics of Pima, Cochise, and Santa Cruz counties.
<b>Local and Regional Economy</b>	The local or regional economy would not change.	Increased recreation resulting from changes in recreation management might benefit the local and regional economy.
<b>Employment</b>	Employment would not change.	Increased recreation might result in more local jobs.

Impacts From Alternative 3	Impacts From Alternative 4
Impacts would be the same as under Alternative 2.	Impacts would be the same as under Alternative 2.
Impacts would be the same as under Alternative 2.	Increased recreation resulting from changes in recreation management might benefit the local and regional economy but would result in a loss of \$129,000 in personal income.
Impacts would be the same as under Alternative 1.	Impacts would be the same as under Alternative 1.

## CHAPTER 3

# AFFECTED ENVIRONMENT



Mattie Canyon near the confluence of Cienega Creek.

# CHAPTER 3

## AFFECTED ENVIRONMENT

### INTRODUCTION

Chapter 3 describes the Empire-Cienega Planning Area's physical, biological, social, and economic characteristics that would be affected by implementing any of the alternatives described in Chapter 2. This description is a baseline for analyzing and determining impacts of the alternatives.

The planning area encompasses 266 mi<sup>2</sup> (170,558 acres) in southeast Arizona roughly bounded by Interstate 10 on the north, Arizona State Highway 83 on the west, the Whetstone Mountains on the east, and the Canelo Hills on the south (See Map ~~1-4~~ 1-2). Table 3-1 summarizes the acres by ownership within the planning area.

### SETTING

The Empire-Cienega Planning Area is a unique, scenic area of rolling desert grasslands and woodlands in a high-desert basin between the Santa Rita and Whetstone Mountains. Located along a scenic highway within an hour of the rapidly growing Tucson metropolitan area, the planning area offers outstanding dispersed recreation opportunities but is also highly vulnerable to the impacts of growth. In addition to Tucson, the planning area is readily accessible from the nearby towns of Sonoita, Patagonia, Benson, and Sierra Vista. Access into the area is provided by dirt roads connecting with State Highways 82 and 83.

The planning area encompasses most of a critical watershed that is important to Tucson for flood control and aquifer recharge. The area also includes five of the rarest habitat types in the American Southwest: cienegas, cottonwood-willow riparian areas, sacaton grasslands, mesquite bosques, and semidesert grasslands. In addition, the planning area contains habitat for several endangered species, a site on the National Register of Historic Places, two proposed wild and scenic river segments, and scenic open space.

**Table 3-1**  
**Land Ownership: Empire-Cienega Planning Area**

Land Ownership	Acres	Percentage
BLM	48,956	28.7
State of Arizona	80,706	47.3
Private	40,896	24.0
<b>TOTAL:</b>	<b>170,558</b>	<b>100.0</b>

### PHYSICAL RESOURCES AND PROCESSES

#### AIR RESOURCES

Under the National Ambient Air Quality Standards (NAAQS), the air quality rating for the BLM-administered lands within the Empire-Cienega Planning Area is Class II. No Class I areas fall within or are contiguous with the planning area. In cooperation with the National Park Service and the National Forest Service, Arizona has established the Interagency Monitoring of Protected Visual Environments Program (IMPROVE), which is monitoring all but two of the 12 Class I airsheds in the state for changes in visibility. Two airsheds relatively

### *Chapter 3: Physical Resources and Processes*

near Sonoita are among the 12: Saguaro National Park and Chiricahua National Monument. But the Saguaro National Park monitoring is on the west side of Tucson, and the Chiricahua National Monument monitoring has not been in place long enough to detect any trends in visibility.

Even without this trend data one can reasonably extrapolate the general air quality of the planning area. None of the county and city monitoring sites in Pima and Santa Cruz counties exceeded standards in 1996 or 1997 (the latest published data). Pollutants measured and within standards included the following:

- Carbon monoxide (1- and 8-hour averages at four sites in Tucson only); lead (quarterly averages at two Tucson sites and one Nogales site).
- Ozone (1-hour average at Saguaro National Park East and five Tucson sites, including Houghton Road near Interstate 10, the nearest site to the planning area).
- Nitrogen dioxide (annual average at only one site in Tucson).
- PM<sup>10</sup> (inhalable particulate matter) (24-hour average at 17 Tucson sites, including two on South Houghton Road and one in Nogales).

Neither the nine Pima County sites (including the site at South Houghton Road and Interstate 10) nor the one Santa Cruz County site exceeded the 98th percentile standard for PM<sup>2.5</sup> (fine particulate matter). Although none of the readings can be assumed to apply beyond their sites' immediate vicinities, one can reasonably assume that no sources in the Sonoita Valley are likely to produce higher readings under similar conditions. Air quality in the Sonoita Valley is good and in full attainment with the Clean Air Act and existing air quality standards. No

restrictions have been placed on or are foreseen for discharges due to existing air quality.

## **GEOLOGY**

The Empire-Cienega Planning Area lies within the Basin and Range physiographic province, a region of north-trending mountain ranges separated by wide basins. The area is mainly within the Cienega Basin, which is bordered on four sides by fault-block mountain ranges: the Santa Rita Mountains to the west, Empire Mountains to the north, Whetstone Mountains to the east, and Canelo Hills to the south. These mountains consist of Paleozoic marine sediments and Mesozoic sedimentary and volcanic rocks intruded by Laramide-age granitic intrusive rock. The Cienega Basin is filled with alluvial material eroded and transported from these surrounding mountains. The alluvium overlies sedimentary rocks of the Cretaceous Bisbee Group. Its maximum thickness is around 1,000 feet as extrapolated from drill hole data.

## **SOIL RESOURCES**

The properties of the soils vary widely because of the following:

- Environmental conditions under which soils were formed.
- Parent material from which they were formed.
- Current environmental conditions.

The dominant soils are Orthents, Argids, and Fluvents, which have a thermic temperature regime and mostly an aridic moisture regime. Shallow Torriorthents (Cellar, House Mountain, Lampshire, Mabray, and Tidwell series) and

Haplustolls (Faraway and Tortugas series) are found in areas of rock outcrop in the planning area's hills and mountains. In the valleys, Haplargids (White House, Bernardino, Sonoita, and Caralampi series) and Torrifluvents (Gila, Glendale, Anthony, Pima, Grabe, and Comoro series) are dominant.

Soils are described in detail in the two soil surveys covering the planning area:

AZ 667 - Santa Cruz County, and parts of Cochise and Pima Counties (Richardson et al. 1979)

AZ 669 - Eastern Pima County - Unpublished (NRCS 1993)

The deep clay and loamy soils immediately next to portions of Cienega Creek and some of the major tributaries are highly susceptible to gully erosion and soil piping. One such area, Lower Wood Canyon, has severe gully erosion and piping on more than 200 acres. Several areas have large active gullies and deep holes resulting from continuing soil movement. In 1993, a large flood (>100-year flood) scoured Cienega Creek creating a five-foot-deep headcut south of Spring Water Canyon. This headcut was stabilized in 1994. Monitoring results show that this erosion has ceased and the site is healing.

## WATER RESOURCES

### Precipitation and Climate

The variability of rainfall in the planning area is extreme. Precipitation varies from a high of more than 25 inches per year in the Santa Rita Mountains to a low of 15 inches in the lower valley locations. About 65% of the moisture occurs as summer thunderstorms (Sellers and Hill 1974). These monsoon rains usually begin

in July and continue into September. The spring months (April, May, and June) and fall months (October and November) are normally dry. Summer temperatures may reach as high as 100°F but are generally lower. Minimum winter temperatures occur in January and can be expected to fall below 29°F.

**Table 3-1a shows annual rainfall totals (for each calendar year) for the Agricultural Research Service (ARS) gage and the Remote Automated Weather Station (RAWS) gage located within the Empire Ranch. The annual rainfall is highly variable at both gages and a "normal" year is seldom encountered. Both gages are about 3 miles apart and the mean and standard deviation for both gages are similar. The mean rainfall is slightly higher at the ARS gage, as expected, since the location is slightly higher in elevation than the RAWS gage. Also notable is that the annual rainfall received by each gage can be considerably different in a given year. For example, the ARS gage recorded less than 9 inches in 1989 while the RAWS gage recorded over 15 inches during the same period. This is due to the fact that most summer moisture occurs in the form of sudden thunderstorms. These storms are highly localized and may drench one area but miss another entirely.**

**In addition, seasonal rainfall is also highly variable in the region. Above average rainfall may occur during the winter period (November through March) with below average rainfall in the summer period (June through September) or vice versa. During the period 1900 through 1998, seasonal precipitation (either winter or summer, but not both) was above average in 51 out of 99 years (Wilson, et al. 2001).**

**Table 3-1a**  
**Summary of Precipitation Data**  
**Las Cienegas NCA**

<b>Calendar Year</b>	<b>Precipitation (inches) Empire ARS Gage Elev. = 4860 ft.</b>	<b>Precipitation (inches) Empire RAWS Elev. = 4600 ft.</b>
1988	16.16	No data
1989	8.51	15.24
1990	12.93	18.80
1991	13.35	14.26
1992	20.15	20.59
1993	19.98	17.01
1994	17.15	8.59
1995	13.87	10.43
1996	11.20	9.23
1997	14.10	9.98
1998	24.50	16.08
1999	13.45	12.52
2000	22.80	21.47
2001	14.40	16.35
<b>Average</b>	<b>15.90</b>	<b>14.65</b>
<b>Std. Dev.</b>	<b>4.52</b>	<b>4.28</b>
<b>Maximum</b>	<b>20.15</b>	<b>21.47</b>
<b>Minimum</b>	<b>8.51</b>	<b>8.59</b>

**Watersheds**

The public lands in the planning area are located in two basins: the Cienega Creek basin and the

Babocomari River basin (Map 3-1). Cienega Creek begins in the Canelo Hills at Papago Spring and runs northward to Pantano Wash, a tributary to the Rillito River in Tucson. The basin area is 228.2 mi<sup>2</sup> (146,038 acres). Table 3-2 summarizes the acres by ownership within the Upper CienegaCreek watershed. Table 3-3 shows major Cienega Creek tributaries that drain from the Santa Rita, Whetstone, and Empire Mountains. The upper basin ends at a geologic constriction known as the Narrows.

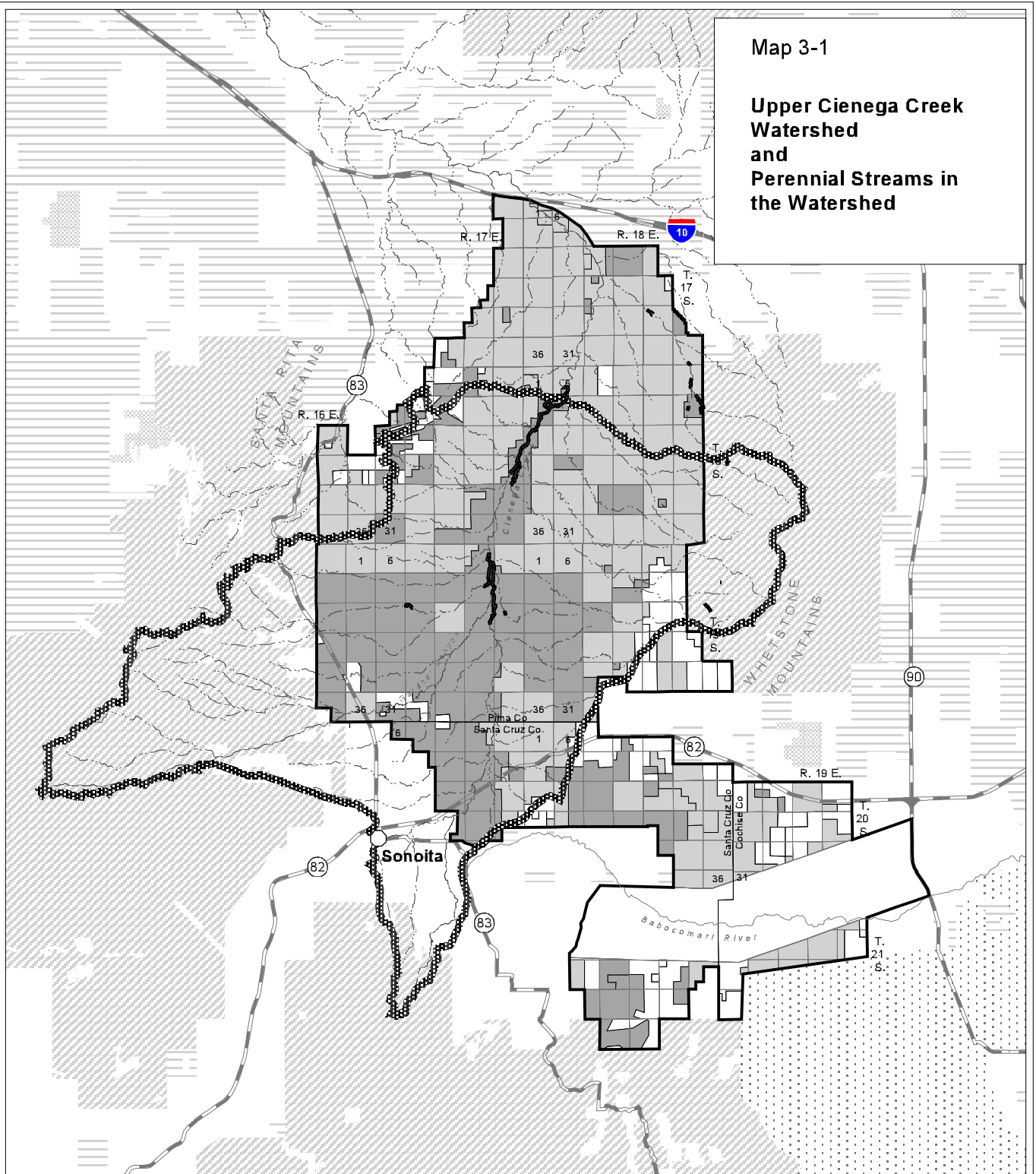
Public lands south of State Highway 82 on the Appleton-Whittell Research Ranch and the Rose Tree Ranch are at the headwaters of the Babocomari River drainage and include portions of Post and O'Donnell canyons.

Between 1974 and 1999 BLM and the University of Arizona collected watershed data that show that the planning area's watersheds are in satisfactory condition with adequate cover and a stable trend (Table 3-4). Overall, the watersheds exhibit a low susceptibility to erosion due to the high amount of coarse fragments in the surface and the existing vegetation cover.

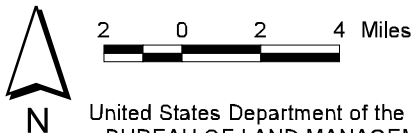
Past activity has altered soil and water resources. The segment of Cienega Creek next to the Cienega Ranch was altered for farming in the 1970s. A drag line dug a canal to divert large flood flows around the Cienega Creek bottomlands that were cultivated. This canal bisected a marsh, draining a large portion of its surface water. Today, this marsh exists as an altered remnant near the Cienega Ranch. Over the years the unlined canal has eroded leaving 20-foot-high banks in some places. Below a concrete ford that serves as a control to channel adjustment, the canal has widened to more than 100 feet and deepened to more than 20 feet.

Map 3-1

**Upper Cienega Creek Watershed  
and  
Perennial Streams in  
the Watershed**



**FINAL  
LAS CIENEGAS  
RESOURCE MANAGEMENT PLAN**



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**LEGEND**

- Planning Area Boundary
- Watershed Boundary
- Intermittent Stream
- Perennial Stream
- BLM Land
- National Forest Land
- Military Land
- State Land (Inside Planning Boundary)
- State Land (Outside Planning Boundary)
- Private Land



**Table 3-2  
Land Ownership, Upper Cienega Creek Watershed**

Ownership	Acres	Square Miles	% of Total
BLM	40,165.7	62.8	27.5
USDA Forest Service	42,667.1	66.7	29.2
State	39,595.7	61.9	27.1
Private	23,610.2	36.9	16.2
<b>TOTAL:</b>	<b>146,038.7</b>	<b>228.2</b>	<b>100.0</b>

**Table 3-3  
Major Tributaries of Cienega Creek**

Source	Tributaries
Santa Rita Mountains	Gardner Canyon, Empire Gulch, Oak Tree Canyon, North Canyon
Empire Mountains	Fortynine Wash, Stevens Canyon, Sanford Canyon, Pump Canyon
Whetstone Mountains	Mud Spring Canyon, Spring Water Canyon, Mattie Canyon, Wood Canyon, Fresno Canyon, Apache Canyon.

**Table 3-4  
Summary of Watershed Condition Data, Empire-Cienega Planning Area, Average Values**

Source	UA <sup>1</sup> -1974	BLM-1989	UA-1991	BLM-1995	BLM-1997	BLM-1999
% Bare Ground	17	21	20	28	33	28
% Gravel/Rock	34	24	23	28	25	22
% Vegetation	49	55	57	44	42	50
Rating	S <sup>2</sup>	S	S	S	S	S

<sup>1</sup> UA = University of Arizona

<sup>2</sup> S= Satisfactory condition which is based on 35% or less bare ground and the absence of active erosional features.

More erosion is evident with each large flood. Where the canal diversion begins, deposition began to fill the now intermittent Cienega Creek channel and scouring deepened the canal, diverting into its base flows of Cienega Creek.

Also during the 1970s, three dikes were installed next to the farmed bottomlands for pumping irrigation water. These dikes backed up water, but have largely filled with sediment over the years. Normal hydrologic function was restored in 1998 along this 1.4-mile segment of Cienega Creek, which had been modified for agriculture. The dikes have been removed, the levee breached, and the canal blocked (Simms 2000).

Mattie Canyon was modified drastically as a result of the agricultural diversion in the 1970s. The canal diverted flood flows for the Cienega Creek watershed into Mattie Canyon causing the canyon to adjust vertically and laterally to accommodate the added water and sediment load. Mattie Canyon had a gully plug that stopped a head cut of more than 20 vertical feet, thus protecting the rest of its watershed from the spread of this erosion. The gully plug was lost during a major flood in the fall of 2000.

## **Groundwater**

The Cienega Creek aquifer consists of tight thin layers of sand alternating with lenses of silt and clay. This area of strata lies at depths to 350 feet. Most wells lie in this upper aquifer. Below 350 feet the layers of sand and silt/clay are subject to pressure from the aquifer below. This pressure causes the lower aquifer to “leak” providing an upward transfer of water (Nuzman 1970). Depth to bedrock ranges from less than three feet to more than 5,000 feet, and water reaches the surface when the depth to bedrock is less than 2,300 feet (Knight 1996).

Mountain front recharge and depth to bedrock ultimately control stream discharge in the Cienega Creek basin. An alluvial trough in the upper basin appears to divert ground water into the San Pedro basin (about 40% of the available subsurface flow). Part of the aquifer lies underneath the Babocomari River and Sonoita Creek basins (Knight 1996; Naeser and St. John 1996). Total ground water outflow from the upper basin (236.5 mi<sup>2</sup>) has been estimated at 7,261 acre-feet (Knight 1996).

Recharge is considered to be almost entirely from mountain front sources and accounts for roughly 6-7% of annual precipitation. The thick soil in the larger valley does not permit much infiltration into the aquifer, but stores water in the soil column where it either evaporates or is transpired by vegetation. The main input of recharge to Cienega Creek is thought to be either Gardner Canyon in the Santa Rita Mountains to the west or the Whetstone Mountains to the east (Huth 1996; Naeser and St. John 1996). The recoverable ground water is estimated to be 5.1 million acre-feet over a 457 mi<sup>2</sup> area (upper and lower basins) (Naeser and St. John 1996).

Water for domestic and agricultural use is limited in the basin, and these uses rely on groundwater supplied by the Cienega Creek aquifer (Bota 1996). Both the towns of Sonoita (population 707 in 1995) and Elgin (population 223 in 1995) overlie the Cienega Creek aquifer. The upper end of the basin, however, appears to grade into the Babocomari drainage to the east. The groundwater supply for the Sonoita-Elgin area is estimated to be 1.2 million acre-feet (Naeser and St. John 1996). But consumption of more than the amount added to the aquifer annually through inflow and recharge—the amount known as safe yield—would eventually.

result in loss of surface flow in Cienega Creek and a loss of the riparian vegetation and other resources.

Naeser and St. John (1996) estimated the safe yield for the Sonoita area and the Upper Cienega Creek basin (excluding the Babocomari portion of the basin in which Elgin is located) to be 3,980 acre-feet per year--the amount of groundwater recharge. Since 2,663 acre-feet are already being used each year, only 1,317 acre-feet per year of use remain within safe yield. Therefore, the safe yield population density may be calculated at 2,767 people if each person consumes 151 gallons a day.

Sonoita is growing rapidly. Current zoning of one residence for every 4.13 acres would result in a population of about 8,200 when the area is fully built out. The resulting water consumption would be 8,092 acre-feet/year, well above the safe yield (Naeser and St. John 1996).

The Upper CienegaCreek watershed has been estimated to provide 10% (6,200 acre-feet) of the recharge to the Tucson Active Management Area (AMA). In addition, the maintenance of this undeveloped watershed in good condition protects Tucson from floods that might surpass the city's flood control channel design. If the basin were fully developed, flood peaks could increase by an estimated 25-50% (Knight 1996).

### **Water Wells**

The Arizona Department of Water Resources has 131 ground water wells registered for the Cienega Creek watershed in its Ground Water Site Inventory (GWSI) database. Sixty-one of the wells are in Pima County, 60 in Santa Cruz County, and 10 in Cochise County. The watershed on the Empire-Cienega, Empirita, and Rose Tree ranches has about 90 wells.

The planning area's water wells have been developed over many years for different uses. The main uses include domestic water for people living on ranches and water for livestock and wildlife, recreational uses, and fire fighting. Some of the existing wells were developed by the Gulf America Corporation (for expected future subdivision) and Anamax Copper (for use in future mining in the Santa Rita Mountains). Jack Greenway **developed wells for livestock and domestic water use.** and Sam Bell developed a few irrigation wells on the Cienega Ranch for farming (See list of water wells in Appendix 3).

### **Surface Water**

#### ***Springs and Reservoirs (Surface Water Impoundments)***

Significant springs in the planning area include Cold Spring, Upper Empire Gulch Spring, Apache Spring, Post Canyon, Smitty Spring, Nogales Spring, and Little Nogales Spring. Perennial ponds include Clyne's Pond (Northwest Reservoir); Cienega Ranch Marsh; and five ponds in Cinco Canyon: # 1, #2, # 3, # 4, and # 7. Early settlers developed most springs when they filed their homestead claims. Some springs have been developed for livestock use. Most developed springs have not been maintained and are used seasonally by wildlife and livestock (See list of springs and reservoirs in Appendix 3).

#### ***Streams***

Cienega Creek has perennial flow for 8.3 miles and its tributaries Mattie Canyon and Empire Gulch have perennial flow for 1.1 and 0.9 miles, respectively (See Map 3-1). Although Cienega Creek and its tributaries have about 10.3 miles of surface water, during droughts the water flow becomes interrupted in places resulting in dewatered stream segments or a series of unconnected pools. Cienega Creek had a loss of

surface water from the canal diversion to Spring Water Canyon (0.75 miles) in the summer of 1997 and a loss of water from Apache Canyon to the Narrows (0.5 miles) in the summer of 1994. Normally, perennial stream segments that go dry during drought total about 1.25 miles or 10% of the stream length.

The University of Arizona measured instantaneous discharge on Cienega Creek from 1975 to 1983 and BLM made these measurements from 1988 to 1994. For 8 years of record the mean stream flow was 2.84 cubic feet/second (cfs) (2,050 acre-feet/year) as measured monthly at a station in the reach between Pump and Fresno canyons. Upstream from its confluence with Mattie Canyon, Cienega Creek's flow diminishes, mainly due to depth of bedrock. At the flow measurement station near the confluence of Oak Tree Canyon and Cienega Creek, base flows ranged from 0.3 to 0.9 cfs between 1988 and 1982. In 1994, BLM discontinued its instantaneous flow measurements at the two locations.

In 1995, a stream gaging station (water level recorder and galvanized housing) was installed at the site of an old masonry dam on Cienega Creek just above the confluence with Sanford Canyon. Continuous operation of this gage has been limited by maintenance problems and inundation by flood flows. The BLM is currently working with the U.S. Geological Survey (USGS) to rebuild this gage and put it in their "real time" gage network for Arizona.

## Water Quality

The Arizona Department of Environmental Quality (ADEQ) is responsible for water quality in Arizona. ADEQ conducts biennial statewide surface water quality assessments and produces a report that lists streams that are not meeting

state water quality standards for their designated uses. In the most recent report, ADEQ designated Cienega Creek and its tributaries in the Upper Cienega Creek basin for the following uses: aquatic and wildlife (warm water fisheries), full body contact (swimming), and livestock use. ADEQ took relatively few samples but did sample three stations on Cienega Creek between 1991 and 1995. Those samples met state standards showing that surface water in the Upper Cienega Creek basin was fully supporting its designated uses.

Fecal coliform, fecal strep, ammonia, and sulfides have been detected in the upper basin and occasionally exceeded state water quality standards over the monitoring period of 1992 and 1993. The source of the fecal contamination was found to be animal (likely cows and other animals). All other water quality parameters have been within acceptable limits (BLM files). ~~ADEQ sampled three stations on Cienega Creek between 1991 and 1995.~~ All samples met water quality standards for the designated uses of warm water fisheries, full body contact, and livestock watering.

Groundwater is the source of all domestic water uses in the Sonoita area. It is pumped from the Upper Cienega Creek Basin and is of high quality. As of 1998, no water from any municipal or domestic wells was being treated. (ADEQ 1998).

## Unique Waters

ADEQ has classified a segment of Cienega Creek below the planning area as a unique water--a water body determined to be one of Arizona's outstanding water resources for at least one of the following criteria: exceptional recreational or ecological significance, such as

important geology, flora, fauna, water quality, aesthetic values, or wilderness characteristics.

Cienega Creek's designation is based upon its importance as a natural groundwater recharge area, as a flood control area, and as habitat for the longfin dace, a native fish. These qualities, as well as values of endangered species habitat, also characterize the segment of Cienega Creek in the Empire-Cienega Planning Area. This segment was recently nominated as a unique water (ADEQ 1999). **Upper Cienega Creek below Gardner Canyon was designated as a Unique Water early in 2002.**

### Water Rights

After acquiring public lands in the Empire-Cienega Planning Area in 1988, BLM submitted new water right claims to the Arizona Department of Water Resources (ADWR) for adjudication. The planning area contains 246 water sources with 254 filings within the San Pedro River watershed and 319 sources with 357 filings in the Santa Cruz River watershed.

## FIRE

### Wildfire

The wildland fire situation in the Empire-Cienega Planning Area is critical from March through July because of the continuous stand of cured grass that easily ignites. Wildfires can quickly consume thousands of acres. The fire danger lessens in late July and August with the return of seasonal rainfall and high humidity. About 50% of all wildfires in this area are human caused.

The planning area's wildland-urban interface brings complexity to the wildland fire situation. Many primary residences and out structures

occupy public and private land. Twelve structures are on public land and hundreds of other residences and outbuildings are on intermixed and adjacent private lands. Any wildfire can quickly and seriously threaten these structures. The intensity of the wildland-urban interface fire situation is predicted to increase due to new construction in the area.

### Fire History

Records from 1980 through 1988 show that 44 fires burned in the planning area (Arizona State Land Department) charring from 1 to 4,000 acres each. Thirty-six percent of all fires burned 100 acres or more before being controlled. Fifty percent of all wildland fires were human caused. Table 3-5 summarizes more recent fire history for the BLM Safford-Tucson Fire Zone encompassing areas administered by the BLM Safford and Tucson field offices. Using the 5-year average from 1993-1997, one can calculate that Arizona BLM responded to an average of 251 fires per year. These fires burned 31,197 acres in the Safford-Tucson Zone.

The cause of the wildland fires varies from year to year. From 1993 to 1997, 42% of the fires (25% of the acres burned) were human caused. This percentage contrasts to that of the previous five years (1988-1992), during which 50% of the fires (41% of the acres burned) were human caused.

Wildland fires in the planning area most often burn on uplands in short grass with scattered mesquite and shrubs. These fires are usually of low intensity but move rapidly through the cured grass and associated vegetation. Grass heights vary from 1 to 3 feet on upland sites (short grass) with densities increasing from north to south. In short grass, flame lengths of up to six feet can spread at a rate of up to 5,148 feet per hour.

**Table 3-5**  
**Fire History - BLM Safford/Tucson Zone**

Year	Human Caused		Lightning Caused		Percentage of Fires		Percentage of Acres	
	Average # Fires	Acres Burned	Average # Fires	Acres Burned	Human Caused	Lightning Caused	Human Caused	Lightning Caused
83-87	73	3,453	67	8,429	51	49	31	69
88-92	87	3,160	91	3,747	50	50	41	59
93-97	104	7,228	147	23,969	42	58	25	75

Fuels in riparian areas and bottomlands are dominated by tall grasses of up to 5 or 6 feet tall growing with mesquite, cottonwood, and other riparian trees. Fires in these fuels burn hotter than in the predominately short grass areas and exhibit moderate resistance to control. Fire in sacaton grass can display flame lengths of up to 12 feet and can spread at a rate of up to 6,864 feet per hour.

Fuels in the uplands and canyons consist mainly of shrubs with a short grass understory along with scattered juniper trees and other desert shrubs. This fuel type is common in the northern and eastern portions of the planning area. Fires can move rapidly through this fuel depending on the density of the grass understory. Resistance to control is low to moderate. Fire flame lengths and rates of movement vary depending on fuel moisture and weather conditions.

### Prescribed Fire

The planning area's prescribed fire history is limited. Records from years before BLM's acquisition of the Empire-Cienega property show that recent prescribed burning was limited to small research burns conducted by the U.S. Department of Agriculture, Agricultural Research Service. These research burns have continued periodically since BLM's acquisition of the area. Small prescribed fires have also

been conducted on the Appleton-Whittell ACEC (Research Ranch) over the past two years.

In the early 1970s, Sam Bell burned 49 Wash almost to 49 windmill, burned from north of the Agricultural Fields to Dominguez on the east side of Cienega Creek, and burned both sides of Cienega Creek south of the Cienega Ranch (Gerald Korte, Letter to BLM received November 26, 2001).

## BIOLOGICAL RESOURCES/PROCESSES

### UPLAND VEGETATION

Vegetation can be classified in a variety of ways for different purposes. For this planning effort, we are using ecological site descriptions developed by the Natural Resource Conservation Service (NRCS). These descriptions provide a system for describing existing vegetation and for comparing existing vegetation conditions to potential or desired future conditions

### Major Land Resource Areas

Arizona was divided into major land resource areas (MLRAs) in the 1960s (SCS 1981) (See Map 3-2). MLRAs are broad geographic areas

### *Chapter 3: Biological Resources/Processes*

having similar topography, climate, soils, and vegetation. In the 1970s, the MLRAs were further divided into sub-resource areas to obtain high-quality ecological site descriptions. Ecological (range) sites have been described for each MLRA.

In southeastern Arizona, the semidesert grasslands of the Southern Arizona Semidesert Grassland Resource Unit (41-3AZ) are perennial grass-shrub dominated rangelands which are positioned between the lower elevation shrublands of the Chihuahuan-Sonoran Desert Shrub (41-2AZ) and Upper Sonoran Desert Shrub (40-1AZ) resource areas and the higher elevation plains grassland and oak-grass savannah of the Mexican Oak-Pine Woodland and Oak Savannah resource area (41-1AZ) (Map 3-2).

The Empire-Cienega Planning Area encompasses about 170,000 acres within the Southeast Arizona Basin and Range Major Land Resource Area (MLRA-41) in the upper end of the 12- to 16-inch precipitation zone. The vegetation in the planning area grows predominately within the Southern Arizona Semidesert Grassland Resource Unit (41-3AZ, 12-16 inch precipitation zone) while higher elevations of the planning area support vegetation in the Mexican Oak-Pine Woodland and Oak Savannah resource area (41-1AZ, 16-20 inch precipitation zone) (Map 3-2).

The planning area is within one of North America's most diverse ecological areas, where the Sonoran, Chihuahuan, and Madrean life zones all come together. The current potential natural vegetation includes oak savannah, open grasslands, and desert shrub. Douglas-fir, Emory oak, and Mexican pinyon dominate the higher elevation woodlands. Cane beardgrass, sideoats grama, blue grama, threeawn species, and plains lovegrass dominate the grassland understories and open grasslands. Whitethorn, cholla, prickly

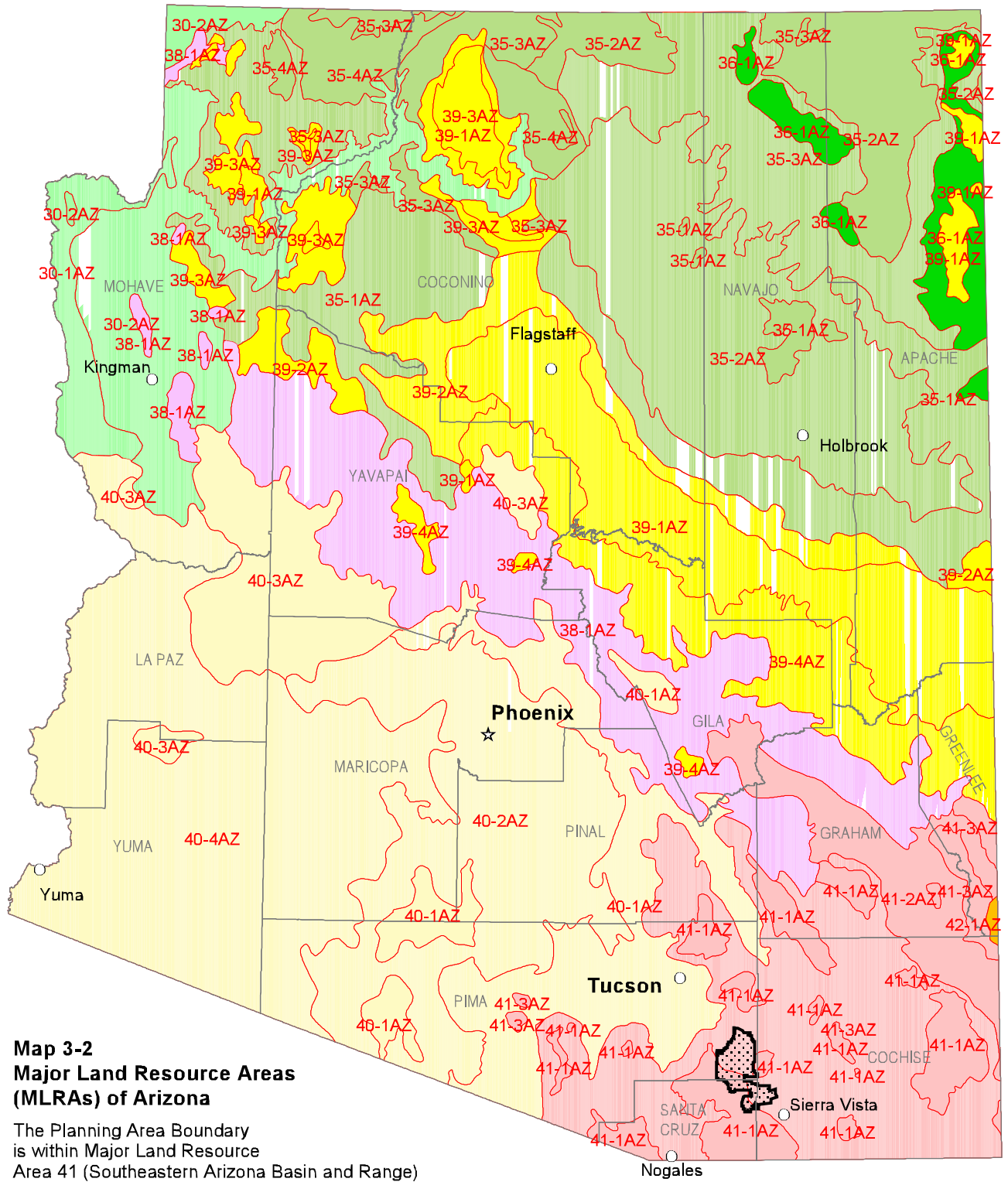
pear, fourwing saltbush, ocotillo, and mesquite, with understories of perennial grasses, grow at the lower to mid elevations.

In the hilly country on both the west and east sides of Cienega Creek, northern exposures support plant communities characteristic of the 16-20 inch precipitation zone. Southern exposures support plant communities characteristic of the 12-16 inch precipitation zone. Table 3-6 summarizes the planning area's MLRAs and corresponding Brown and Lowe biotic communities (Brown, D. 1982).

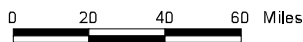
### **Ecological Sites**

An ecological site is a unit of land occupying a specific environmental zone (MLRA) and capable of supporting a native plant community typified by an association of plant species that differs from other ecological sites in the kind or proportion of species. Within the MLRAs, the ecological sites are delineated by such criteria as topographic position, percent slope, soils and parent geologic material, precipitation, and elevation. Table 3-7 lists Sonoita Valley ecological sites within MLRA 41 - Southeastern Arizona Basin and Range.

Ecological site descriptions are based on the concept of ecological site potential. The historic climax plant community--what could grow in response to the physical characteristics--may differ greatly from the existing plant community, which has been influenced by environmental variation or management practices. The ecological site approach recognizes that different vegetation states can occur on similar sites because of different environmental forces or land management practices.



**FINAL  
LAS CIENEGAS  
RESOURCE MANAGEMENT PLAN**



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**LEGEND**

-  Planning Area
-  Arizona Interior Chaparral
-  Arizona and New Mexico Mountains
-  Colorado and Green River Plateaus
-  Mohave Basin and Range
-  New Mexico and Arizona Plateaus and Mesas
-  Sonoran Basin and Range
-  Southeastern Arizona Basin and Range
-  Southern Desertic Basins, Plains, and Mountains



**Table 3-6  
Description of Major Land Resource Areas and Historic Climax Plant Communities in the Empire-Cienega Planning Area**

Major Land Resource Area	Corresponding Brown-Lowe (Vegetation Communities)	Selected Characteristics of Major Land Resource Areas			
		Elevation (in feet)	Landform Geology	Potential Climate	Historic Climax Plant Community
41-1AZ Oak-Pine Woodland and Oak Savannah	Madrean- Evergreen Woodland	5,500 to 8,500	Steep, rocky hills and mountains	Ppt 16-35" 60% during summer	Mexican blue, Arizona white, Emory and silverleaf oaks; Arizona rosewood; mountain mahogany; Mexican pinyon, Apache and Chihuahuan pine; manzanita; turbinella oak; silktassel; skunkbush; sideoats, hairy, and spruce top gramas; deergrass; Texas little and cane bluestem; plains lovegrass.
	Plains Grassland		Gently to strongly sloping fans, and level valley floors		Sideoats, hairy, and spruce top gramas; Crinkle-awn, bullgrass, wolftail, Texas timothy, little and cane bluestem; plains lovegrass.
41-3AZ Southern Arizona Semidesert Grassland	Semidesert- Grassland	3,500 to 5,500	Gently to strongly sloping fans, and level valley floors	Ppt 12-16" 60% during June through Sept.	Sideoats, black, hairy, blue, slender and spruce top gramas; bush muhly; Arizona cottontop; cane bluestem; alkali and big sacaton; vine mesquite; plains lovegrass; squirreltail; tobosa; fourwing saltbush; soap tree yucca; range ratany; false mesquite; shrubby buckwheat.

A vegetation state is the general description of the ecological site's characteristics. As the characteristics change, a site changes to a new state. The different plant communities produced by an ecological site are called vegetation states. The processes that cause a shift from one state to another are called transitional pathways.

**Historic and Existing Upland Vegetation States**

Before European settlement the upland ecological sites in the Empire-Cienega Planning Area were in a balance with a prevailing pattern of large, fast-burning wildfires consuming huge amounts of the perennial grass in late spring and early summer before the summer monsoons.

These wildfires controlled invasive brush and trees. They helped recycle nutrients. And they resulted in the rapid regrowth of fresh perennial grasses. The visual aspect of the rangeland was an open grassland dominated by perennial grasses such as plains lovegrass, cane beardgrass, sideoats grama, black grama, blue grama, bush muhly, sacaton, vine mesquite, and several threeawn species intermixed with leaf succulents, including yuccas, agaves, and beargrass. But mesquite, burroweed, whitethorn, snakeweed, and Lehmann's lovegrass have invaded much of the planning area to various degrees.

**Table 3-7**  
**Sonoita Valley Ecosites within Major Land Resource Area (MLRA) 41 - Southeastern Arizona Basin and Range**

<b>Ecological Site Descriptions</b>	
<p>41-3AZ-Southern Arizona Semidesert Grassland</p> <p>Basalt Hills, 12-16"precip. zone                      Clayey Hills, 12-16"precip. zone                      Limestone Hills, 12-16"precip. zone                      Limy Slopes, 12-16"precip. zone                      Limy Upland, 12-16"precip. zone                      Loamy Bottom, (PRJU), 12-16"precip. zone                      Loamy Bottom, Subirrigated, 12-16"precip. zone                      Loamy Bottom, Swales, 12-16"precip. zone                      Loamy Hills, 12-16"precip. zone                      Loamy Upland, 12-16"precip. zone                      Sandy Bottom, 12-16"precip. zone                      Sandy Bottom, Subirrigated, (POFR, SAGO),                      12-16"precip. zone                      Sandy Loam Upland, 12-16"precip. zone                      Sandy Loam Deep, 12-16"precip. zone                      Shallow Upland, 12-16"precip. zone                      Volcanic Hills, 12-16"precip. zone</p>	<p>41-1AZ-Mexican Oak-Pine Woodland and Oak Savannah</p> <p>Limestone Hills, 16-20"precip. zone                      Limy Slopes, 16-20"precip. zone                      Limy Upland, 16-20"precip. zone                      Loamy Bottom, 16-20"precip. zone                      Loamy Bottom, subirrigated, 16-20"precip. zone                      Loamy Hills, 16-20"precip. zone                      Loamy Upland, 16-20"precip. zone                      Sandy Bottom (QUEM, QUAR), 16-20"precip. zone                      Sandy Bottom, subirrigated, (PLWR, JUMA, FRVE2),                      16-20"precip. zone                      Sandyloam Upland, 16-20"precip. zone                      Volcanic Hills, 16-20"precip. zone                      Loamy Bottom, Swales, 16-20"precip. zone                      Loamy Upland, Limy, 16-20"precip. zone                      Shallow Upland, 16-20"precip. zone</p>

Continuous livestock grazing, climatic changes, and suppression of wildfire over the past century have reduced desirable perennial grasses and changed much of the area from the native mid-grass historic climax plant community to a native grass-mesquite-half shrub state or a mixed native/Lehmann's lovegrass-mesquite-half shrub vegetation state. The historic vegetation states are shown in Map 3-3. Existing vegetation states are shown in Map 3-4.

**Ecological Processes in Grasslands**

Upland vegetation communities change over time due to environmental influences. The vegetation communities continuously move among a series of ecological states in response to disturbance factors such as climate, grazing, fire, and disease.

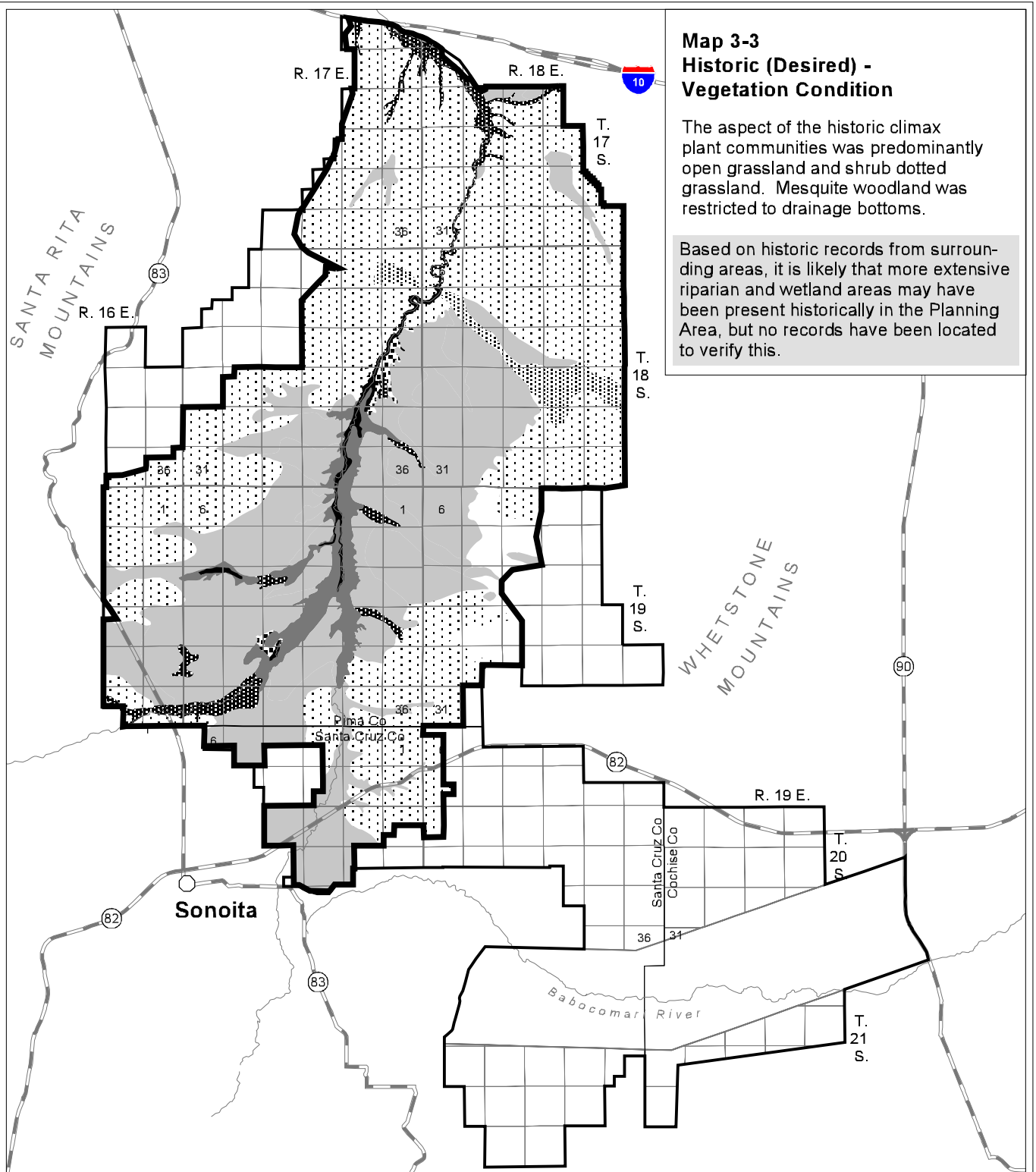
The present vegetation communities in the planning area are an expression of **climate**, the past disturbance regimes and land use practices.

**Above average winter precipitation tends to favor growth and seedling establishment of mesquite and other shrub species while above average summer precipitation tends to favor growth and seedling establishment of perennial grass species (Wilson, et al. 2001). This variability may partially explain the dynamic fluctuations of plant community structure and species composition, although long-term direction changes in plants communities (from grassland to mesquite woodland, for example) are more influenced by human activities: grazing, wood cutting, mining, settlement patterns, species introductions, etc. (Bahre 1991).**

### Map 3-3 Historic (Desired) - Vegetation Condition

The aspect of the historic climax plant communities was predominantly open grassland and shrub dotted grassland. Mesquite woodland was restricted to drainage bottoms.

Based on historic records from surrounding areas, it is likely that more extensive riparian and wetland areas may have been present historically in the Planning Area, but no records have been located to verify this.



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### LEGEND

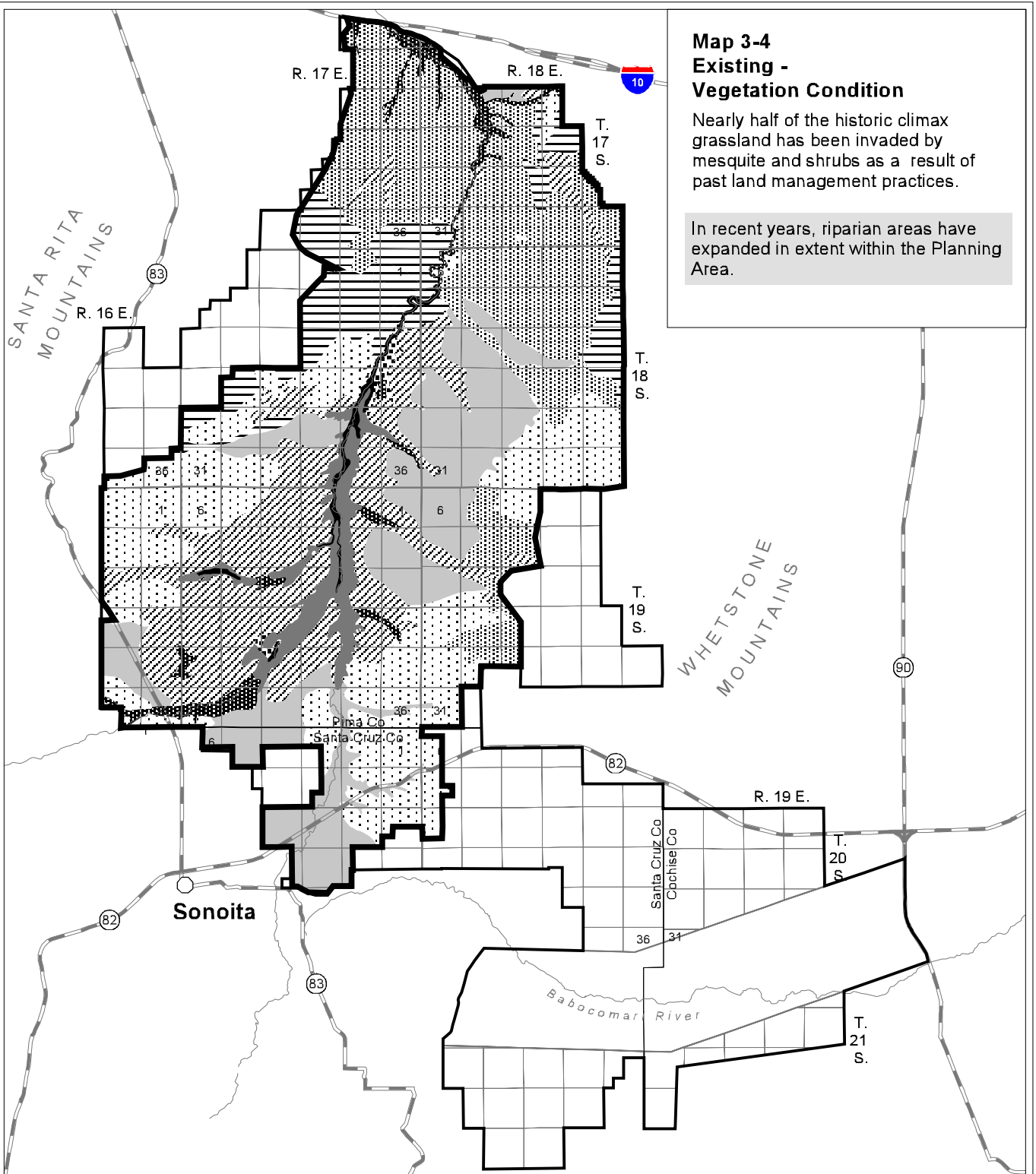
- Planning Area Boundary
- Survey Boundary
- Grassland
- Mesquite
- Riparian
- Shrub Land
- Sacaton
- Shrub Dotted Grassland
- Xero-Riparian Area

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### Map 3-4 Existing - Vegetation Condition

Nearly half of the historic climax grassland has been invaded by mesquite and shrubs as a result of past land management practices.

In recent years, riparian areas have expanded in extent within the Planning Area.



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### LEGEND

- Planning Area Boundary
- Survey Boundary
- Grassland
- Grassland-Mesquite
- Shrub-Mesquite
- Mesquite
- Riparian
- Shrub Land
- Sacaton
- Shrub Dotted Grassland
- Xero-Riparian Area

### Chapter 3: Biological Resources/Processes

In the planning area's semidesert grasslands before European settlement, fire was probably the single most common disturbance controlling the transition from open grassland states to shrub- and tree-invaded states on the upland ecological sites. Periodic wildfires reduced shrub cover and allowed grasses to remain dominant.

Livestock grazing played a major role in defining the present ecological states of the grasslands. Year-long grazing gave cattle the greatest opportunity to selectively graze preferred plants. This grazing resulted in undue intensity and frequency of defoliation of these species placing them at a disadvantage in plant competition. **Livestock can select for unpalatable species, such as various forbs and shrubs, by reducing competition through consumption of desirable species.** The frequency of fire in these grasslands was later reduced by removal of these perennial grasses as fuels and by human fire suppression. Under heavy grazing and with low fire occurrence, shrubs will generally remain until removed by fire or some other disturbance. Mesquite, burroweed, whitethorn, and other shrubs have increased in response to the loss of perennial grasses in some areas.

**Other land use practices also affected ecological conditions. In the 1970s, Sam Bell maintained a large woodcutting operation and harvested most of the mature (mesquite) trees in the 49 Wash area, along Cienega Creek from north of the Agricultural Fields to vicinity of Pump Canyon confluence, and along Cienega Creek from the Cienega Ranch south. Stumps were burned and uprooted by bulldozer. The removal of trees in some areas contributed to loss of sacaton and other perennial and annual grass cover and resulted in some areas in bare ground, erosion, and invasion of white-thorn and other shrubs (Gerald Korte, Letter to BLM received November 26, 2001).**

### Ecological Site Inventories

Ecological site inventories delineate and measure existing plant communities and compare these communities to potential plant communities that could grow on the same site as a result of changes in management actions.

Ecological site delineations are landscape divisions used to provide order to a complex system of vegetation in regions. The major significance of the concept includes its ecological relevance. Soils data play the major role in extending existing data to similar environmental conditions. Often, changes in soils will define a unique vegetation community and ecological site. But similar vegetation communities may grow on different soils, and therefore the ecological sites may be a unique soil series or an association of different soils with properties that produce similar vegetation. Ecological site delineations require more than a soils map. Vegetation analysis in the field is a must (Ruyle-Range Site Concept: URL: <http://ag.arizona.edu/OALS/agnic/siteguides/concept.html>).

For each ecological site, the Natural Resources Conservation Service (NRCS) develops and maintains ecological site descriptions, which include descriptions of the historic climax plant community (NRCS Grazing Lands Technology Institute 1997, *National Range and Pasture Handbook*). The historic climax plant community is based upon the ecological potential and capability of each site. The ecological site descriptions are used in the ecological site inventory to determine present vegetation condition by comparing the present vegetation to vegetation states that can exist on the site, including the historic climax plant community. The comparison can be made

through a similarity index. The index is expressed as the percentage of the desired plant community that is present on the site. In assessing a site's condition or degree of function, the evaluation compares each site to its own potential.

A comparison of the present plant community to the historic climax plant community on a particular ecological site provides: (1) a basis for describing the extent and direction of changes that have taken place, and (2) a way of predicting changes that can take place in the plant community as a result of a specific treatment or management action. The similarity index of a site to the historic climax community, therefore, measures change

This index shows how climate and management have affected a site's plant community. This information gives us a starting point for setting objectives and monitoring progress in achieving them. The goal is often to change the present plant community toward a plant community that better protects the health of the basic rangeland resource. Or, the resource objective may be to achieve a certain habitat type or mosaic for wildlife management or endangered species recovery (NRCS Grazing Lands Technology Institute 1997).

BLM has completed ecological site inventories on most of the planning area. The ecological site inventory for the Empire-Cienega allotment was completed in the fall of 1995, and the ecological site inventory for the Empirita allotment was completed in 1994 (Map 3-5). Ecological site inventories have not been completed for the Rose Tree and Vera Earl allotments or for lands within the Empire Mountains. ~~An ecological site inventory is in progress for the Appleton-Whittell ACEC (Research Ranch).~~ **The Appleton-Whittell (Research Ranch) property has had a new ecological site inventory and soil survey**

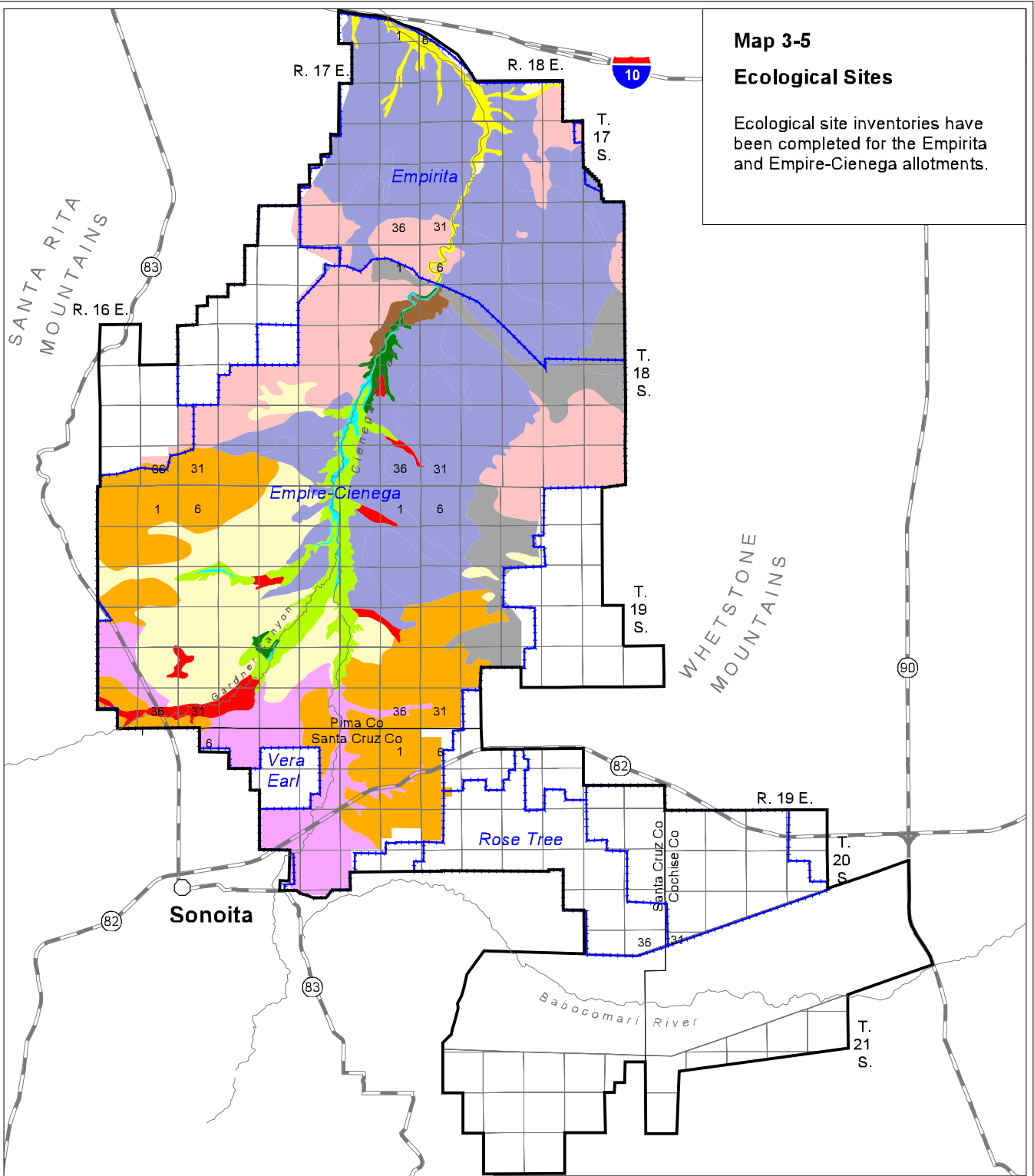
**completed by NRCS and the Research Ranch in the spring of 2001.** Table 3-8 summarizes the ecological sites within the Empire-Cienega and Empirita portions of the planning area. More detailed descriptions of the ecological sites and more information on the ecological site inventories and monitoring locations are included in Appendix 3, Ecological Site Inventories. Plant communities on these ecological sites are strongly influenced by the soil's ability to capture water from intense summer thunderstorms. Sites with sand to sandy loam surface textures are more productive in this resource area because of their ability to capture most of the summer rain. These sites produce extremely diverse and productive grasslands. Ecological sites with heavier textured surfaces allow most of the summer moisture to run off. The slow, gentle winter rains provide most of the soil moisture on these sites, which tend to support more deep rooted shrubs.

## RIPARIAN AND WETLAND AREAS

About 18.5 miles of riparian habitat occur along Cienega Creek and its tributaries--Mattie Canyon, Empire Gulch, Gardner Canyon, Mud Springs, and North Canyon--on BLM-administered public land (Map 3-6). An additional 2.2 miles are present on intermixed State Trust Lands. The cienega or marsh vegetation that gives Cienega Creek its name occurs within most of its perennial reaches. The stream banks are dominated by deer grass with varying densities of cottonwood/willow riparian woodland. Extensive sacaton grasslands occupy the stream terraces along Cienega Creek south of its confluence with Mattie Canyon. North of the Mattie Canyon confluence, mesquite bosques grow next to the cottonwood-willow dominated riparian woodlands. Several natural perennial ponds with cienega vegetation are also found in the sacaton grasslands on the Cienega Creek floodplain.

**Map 3-5  
Ecological Sites**

Ecological site inventories have been completed for the Empirita and Empire-Cienega allotments.



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**LEGEND**

- Planning Area Boundary
- Grazing Allotment Boundary
- Basalt Hills
- Deep Sandy Loamy, Sandy Bottom
- Limestone Hills, Limestone Hills/Limey Uplands/Volcanic Hills
- Limey Slopes, Limey Slopes/Limey Upland, Limey Slopes/Loamy Upland
- Loamy Bottom Subirrigated
- Loamy Bottom Mesquite Bosque
- Loamy Hills, Loamy Hills/Limey Slopes
- Loamy Upland Swales
- Sandy Bottom Swales
- Sandy Bottom Subirrigated
- Sandy Loam Upland/Loamy Upland
- Volcanic Hills, Volcanic Hills/Limey Slopes, Volcanic Hills/Shallow Upland/Clay Hills

**Table 3-8  
Ecological Sites Within the Empire-Cienega and Empirita Ranch Areas**

<b>Ecological Site</b>	<b>Similarity Index to Historic Climax (Range)</b>	<b>Visual Aspect-Historic Climax Plant Community</b>	<b>Acres</b>	<b>% of Total</b>
Basalt Hills	71	Shrub-Grass Mixed	601	0.6
Deep Sandy Loam/Sandy Bottom		Grassland	1,494	1.5
Limestone Hills and Limestone Hills/ Limey Upland/Volcanic Hills	60-67	Shrubland Mixed with Grassland	5,847	5.8
Limy Slopes and Limy Slopes/Limy Upland and Limy Slopes/Loamy Upland	54-60	Shrubland Mixed with Grassland	37,533	37.3
Loamy Bottom/Subirrigated	66	Sacaton	3,744	3.7
Loamy Bottom/Mesquite	N/A	Mesquite Bosque	581	0.6
Loamy Hills and Loamy Hills/Limy Slopes	59-92	Oak Woodland with Grassland	16,108	16.0
Loamy Upland		Grassland (Savannah)	115	0.1
Loamy Upland/Swales	42-77	Grassland	6,577	6.5
Sandy Bottom/Swales	65	Xeroriparian with Grassland	1,528	1.5
Sandy Bottom/Subirrigated	N/A	Deciduous Riparian Woodland	614	0.6
Sandy Loam Upland/Loamy Upland	31-54	Grassland (Savannah)	11,523	11.5
Volcanic Hills and Volcanic Hills/Limy Slopes and Volcanic Hills/Shallow Upland/Clay Hills	66-85	Oak Woodland Intermixed with Grasses and Shrubs	14,350	14.3
<b>TOTAL:</b>			<b>100,616</b>	<b>100</b>

**Sonoran Riparian Deciduous Woodland**

The planning area’s riparian woodlands occur on the Sandy Bottom-Subirrigated ecological site on the low stream terrace and stream banks of the wet reaches of Cienega Creek, Empire Gulch, and Lower Mattie Canyon. This site benefits from high water tables and the extra moisture from flooding. Soils are deep and sandy. Slopes are nearly level. The potential plant community is a southwestern deciduous riparian woodland dominated by Fremont cottonwood (*Populus Fremontii*) and Goodding willow (*Salix gooddingii*). Tree canopy can be

as high as 70% on this site. Other trees found in minor amounts include velvet ash (*Fraxinus pensylvanica*), Arizona walnut (*Juglans major*) and netleaf hackberry (*Celtis reticulata*). Seep willow (*Baccharis glutinosa*) is a common shrub in the understory.

**Southern Arizona Warm-Temperate Riverine Marshes (Cienegas)**

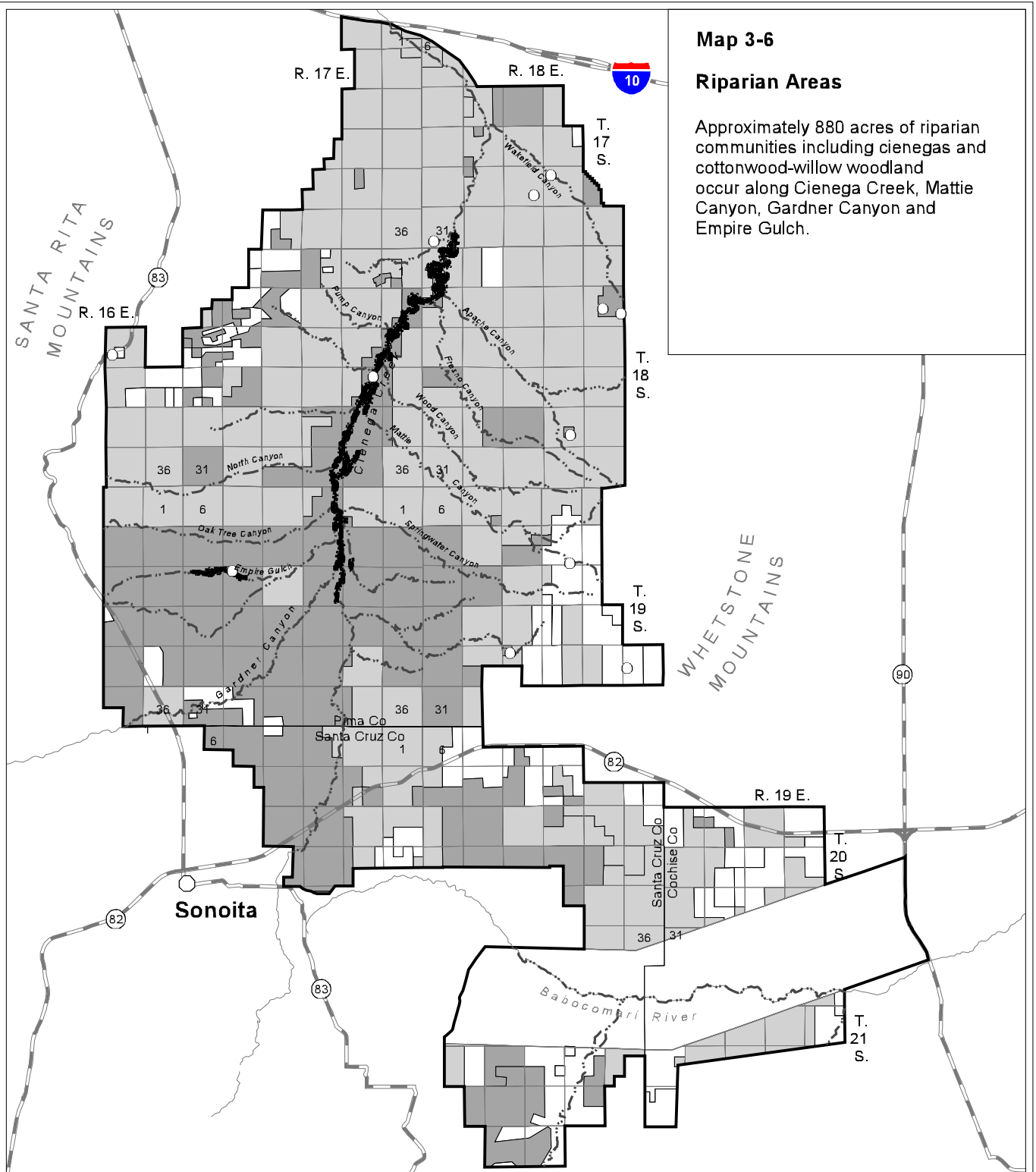
This is the cienega or marsh community for which Cienega Creek is named for but which



### Map 3-6

### Riparian Areas

Approximately 880 acres of riparian communities including cienegas and cottonwood-willow woodland occur along Cienega Creek, Mattie Canyon, Gardner Canyon and Empire Gulch.



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### LEGEND

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Riparian Areas
- Springs
- Drainage/Stream

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an ecological site description has not been developed. Cienegas occur within wide, gently sloping valleys where flood velocities are readily dissipated and at sites where ground water intersects the surface to form areas of deep to shallow perennial water bordered by drier margins with intermittently saturated soils.

Cienega vegetation often grows in zones or bands that reflect these gradients of water availability. Areas with saturated soil or shallow water are vegetated mainly by grasses (Gramineae) and by low-statured emergents including rushes (*Juncus* spp), sedges (*Carex* spp), flat sedges (*Cyperus* spp) and spike rushes (*Eleocharis* spp). Deeper pools support submergent aquatic vegetation such as penny wort (*Hydrocotyle* spp) and stonewort (*Chara* spp).

Cienega soils consist of layers of organic peats and fine-textured silts. These soils can build to depths of several meters, as the productive cienega vegetation annually grows and decomposes and as silts are trapped during flood flows. The sponge-like organic soils store water and increase base flows during droughts. And the cienega's densely vegetated surface moderates peak flows during wet periods (BLM files; Fernald 1987; Hendrickson and Minckley 1984).

Along Cienega Creek, representative aquatic and semiaquatic vegetation includes: deer grass (*Muhlenbergia rigens*), cattail (*Typha latifolia*, *Typha domingensis*), bulrushes (*Scirpus*), rushes (*Eleocharis*, *Juncus*, ~~*Carex*~~), sedges (*Cyperus*, ~~*Carex*~~), yerba mansa (*Anemopsis californica*), Goodding willow, water parsnip (*Berula erecta*), stonewort (*Chara*), horned pond-weed (*Zannachellia palustris*), penny-wort (*hydrocotyle verticillata*), and speedwell (*Veronica*). Cienega Creek is bordered by the

Riparian Woodland community as described above.

### **Aquatic and Riparian Processes**

Riparian areas and associated stream channels constantly undergo change. The riparian area and associated aquatic habitat are exposed to natural external factors, mainly stream flow and sediment transport (Rosgen 1996; Swanston 1991).

Properly functioning riparian areas change gradually and have adequate vegetation, floodplain development, or woody debris to dissipate flood energies (BLM 1993). Water from floods is slowed and spread out on floodplains where it can seep into the soil and drop sediment, which builds banks and floodplains.

### **Canyon-Bound Streams**

Riparian vegetation, mainly in the form of cottonwoods, willows, and deer grass, holds soil against erosion and improves fish habitat by holding banks and allowing a diversity of fish habitat types to form through sediment scour and deposition. In this way riparian plants influence the formation of pools, cover, riffles, runs, bars, braids, and clean spawning habitat. But large floods may scour riparian vegetation and stream banks, where the floodplain has been reduced by narrow canyon features of channelization or where bank vegetation has been reduced.

Rainfall and watershed conditions influence flooding. Watersheds dominated by bare ground or with reduced ground cover foster flash flooding. Flash flooding in turn can destabilize channel features as the stream adjusts to the new flood and sediment regime (Rosgen 1996). Excess sediment from these unstable watersheds can fill with fine sediment important fish habitat features such as pools and riffles. And

### *Chapter 3: Biological Resources/Processes*

tributaries adjusting to a new base level in a down-cut mainstem stream can inflict other damage.

Riparian vegetation goes through stages of development as young trees grow older and sediment deposition builds banks and terraces that alter the soil-water relationships that influence plant species composition, density, and abundance. Early stages (early seral) have fewer species and younger age classes of trees. Later stages (late seral) have more species and more older trees. If a riparian area can function unimpaired by disruptive land practices, it may attain its potential (BLM Proper Functioning Condition Work Group 1993, Figure 3).

Flooding serves to disturb the riparian community and allow new seed beds to develop for tree seedlings and openings for herbaceous plants. The result is a mosaic of plant species, age classes, and microclimates--a mosaic that supports a diversity of habitat conditions and animals.

The impairment of vegetation development that reduces vegetation density, plant vigor, or production directly alters the integrity of floodplains and stream banks. This impairment leaves the degraded riparian area vulnerable to further damage by flooding as the riparian community has lost its ability to dissipate flood energy and resist erosion (BLM Proper Functioning Condition Work Group 1993; BLM Channel Evolution 1990, Figure 2).

#### ***Cienegas***

Unlike most riparian areas dominated by trees, herbaceous marsh vegetation holds soil against erosion. This action improves fish habitat by holding soil and banks that allow for a diversity of fish habitat types to form through sediment scour and deposition (Rosgen 1996; Hendrickson and Minckley 1984; Leopold 1997; Medina et al. 1995). In this way wetland plants influence

the formation of pools, runs, and riffles. Wetland plants also contribute to habitat quality by providing undercut banks, overhanging cover, shade, and escape cover in spaces between plant stems.

Beaver are thought to have played an important role in forming and perpetuating cienegas. Their dams prevent erosion, collect and retain organic matter and sediment, and raise water tables. Beaver are known to have been present along "Cienegas de Los Pimas," which stretched from the town of Tucson to Pantano before statehood (Hendrickson and Minckley 1984).

Channel scouring and sediment deposition on the floodplain continually change soil conditions and stream channel features. These changes influence plant community dynamics and channel features (pools, runs, riffles).

The composition and structure of the riparian community can likewise influence sediment deposition and soil stability creating a dynamic feedback response between the plant community and physical processes (Hendrickson and Minckley 1984; Medina et al. 1995). For example, rushes, bunch grasses, carpets of sedges, and stands of willows trap sediment during floods. These plants also bind soils with roots (Cornwall 1998). Herbaceous plants with deep fibrous roots and the highest stem density and above-ground biomass in cienega wetlands provide the most soil stability and are not disturbed even by large floods (Cornwall 1998; Hendrickson and Minckley 1984). Instead, floods act on "nick points" where vegetation has been disturbed and turbulence exists during floods. As bed material is scoured, it is redeposited in run or riffle areas at the toe of the pool and adjacent floodplain.

Riffles and runs contain armored sediments that are further stabilized by vegetation, especially plant roots, which cover the floodplain and cross

runs and riffles (Medina et al. 1995). “Nick points” that turn into pools eventually stabilize when they reach bed materials or vegetation thick enough to prevent further erosion. As a result of these processes, Cienega Creek contains “slit pools” over 6 feet deep as well as runs and riffles that average less than 6 inches deep. These pools, runs, and riffles are often surrounded by saturated soil or thin sheets of standing water with thick mats of marshland vegetation and Goodding willows.

Flooding and sediment input are influenced by rainfall and watershed characteristics and condition/health (NRCS 1994; Brooks et al. 1991). Watersheds dominated by bare ground or with reduced ground cover foster larger flood peaks, which can destabilize cienegas (Leopold 1994; Brooks et al. 1991; Hendrickson and Minckley 1984). Excess sediment from these unstable watersheds can fill with sediment important fish habitat features such as pools and riffles (Rosgen 1996; Leopold 1994, 1997; Meehan 1991). Over geologic time, rare heavy floods may scour marsh vegetation and stream banks, which are recolonized by plants and eventually evolve back into cienegas.

### **Aquatic Habitat**

Aquatic habitats are controlled mainly by sediment input and transport, which are functions of the volume and pattern of precipitation and runoff. Watershed and riparian health influence sediment transport and runoff characteristics, which affect flood magnitude. Along the stream channel, high-gradient, narrow channels receive coarser substrate, while finer sediments are deposited where floodplains are wider and gradients lower. Pools tend to be permanent only where protected from excess sediment from ephemeral tributaries. When sediment input is excessive, pools may become rare due to sediment filling. In constrained canyon-bound reaches of streams, non-native

fish cannot resist flooding. Unlike native fishes that have adapted to flooding in constrained canyon reaches, these exotic fishes tend to be eliminated or severely reduced by floods (Minckley and Meffe 1987).

In contrast, Cienega Creek is a valley bottom stream with a wide floodplain that is ideal for establishing and spreading non-native fishes to the exclusion of Gila chub and Gila topminnow. In this type of system, non-native fishes, once established, constitute a biotic habitat element that is incompatible with and can eliminate native fishes (Minckley and Deacon 1991)

### **Riparian and Wetland Area Condition and Inventory**

BLM inventoried riparian areas along Cienega Creek and its tributaries on public lands from December 1988 through July 1989 (Table 3-9). The riparian inventory techniques are outlined in the BLM Phoenix District’s Riparian Area Condition Evaluation (RACE) Handbook (BLM 1987d). As a result of the 1988-89 inventory, 11.1 miles (60%) of riparian habitat received ratings of 5-11 for an overall unsatisfactory rating, and 7.5 miles (40%) of riparian habitat received total ratings of 12-16 for an overall satisfactory rating.

The woody species regeneration rating was the major contributor to overall unsatisfactory ratings in 1988-89. Nipping of the apical meristem on seedling trees often stunts growth or kills seedlings and can prevent the establishing of young trees as replacements in the riparian system. Thus, where cattle and deer had nipped the tops of more than 80% of the young trees, the segment received the lowest rating for woody species regeneration. This heavy browsing occurred on 11.3 miles of riparian area of which 8.4 miles (or 74%) received overall ratings of unsatisfactory. An additional 2.9 miles of riparian area received

**Table 3-9  
Riparian Area Condition Evaluation (RACE) Summaries for Empire-Cienega Riparian Areas**

Stream	Length	1989-1990		1993		2000	
		% length satisfactory	% length unsatisfactory	% length satisfactory	% length unsatisfactory	% length satisfactory	% length unsatisfactory
Cienega Creek	12.5	43 <sup>1</sup>	57	71 <sup>2</sup>	29	92 <sup>3</sup>	8
Empire Gulch	3.3	40	60	-	-	-	-
Gardner Canyon	1.3	0	100	-	-	-	-
Mattie Canyon	1.2	100	0	-	-	-	-
North Canyon	0.6	0	100	-	-	-	-
Cienega Canal	0.9	0	100	-	-	-	-
Mud Springs	0.3	100	0	-	-	-	-
<b>TOTAL:</b>	<b>20.1</b>	<b>40<sup>1</sup></b>	<b>60</b>	<b>71</b>	<b>29</b>	<b>92</b>	<b>8</b>

<sup>1</sup> Calculations exclude 1.5 miles of riparian area on Cienega Creek which were not sampled in 1989/90.

<sup>2</sup> Calculations exclude 0.6 miles of riparian area on Cienega Creek which were not sampled in 1993.

<sup>3</sup> Calculations exclude 0.6 miles which are no longer managed as riparian in 2000 due to lack of site potential.

woody species regeneration ratings of 1 and overall unsatisfactory ratings due to poor conditions for establishing seedling trees, such as lack of surface water.

BLM found the following other problems in riparian areas in 1988-89:

- Off-road vehicle travel in the creek bed.
- Bank alteration by vehicles, livestock, and old irrigation projects.
- Loss of vegetation cover from livestock use.
- Head cuts, which may have been caused by runoff from roads or past overgrazing.

Most of these problems have been corrected since 1990. Livestock access to riparian areas

has been controlled by installing riparian fencing along most of Cienega Creek. BLM has closed several road crossings and rerouted traffic across hard-surfaced crossings. As a result, riparian conditions have improved markedly. Although the soils along Cienega Creek are highly erodible, increases in deer grass, willow, cottonwood, rushes, horsetail, and other plants have stabilized the banks to the point that even large floods do not affect most bank surfaces. Increases in riparian vegetation density have increased overstory and mid-story cover and vegetation cover on banks.

In 1993 and again in 2000, BLM re-assessed the riparian areas along Cienega Creek using the riparian evaluation portion of the RACE inventory. The results showed continued improvement along much of the creek. Of the 11.9 miles of riparian habitat evaluated in 1993,

8.5 miles (71%) were in satisfactory condition and 3.4 miles (29%) were in unsatisfactory condition. Of the 12.5 miles assessed in 2000, ~~100%~~ **92%** were in satisfactory condition (See Table 3-9 and Appendix 3, Riparian Area Conditions and Management). Riparian proper functioning condition assessments completed in 1993 and in 2000 showed similar trends with the percentage of the creek in proper functioning condition increasing from 2% to 61% (See Table 3-10 and Appendix 3, Riparian Area Conditions and Management).

### **Aquatic Habitat Condition and Inventory**

In 1989-90 BLM classified all aquatic habitats along the perennial length of Cienega Creek and inventoried them for characteristics related to fish habitat. BLM inventoried habitat type and 12 parameters of habitat complexity, including depth, vegetation cover in the water, cover overhanging the water's surface, and undercut banks. In 2000, BLM re-assessed aquatic habitats along four segments of Cienega Creek to determine change over the 10-year period (Tables 3-11, 3-12, and 3-13). The selected segments varied from 0.28 to 0.52 miles in length. They were monitored for the same fish habitat characteristics as in 1989-90.

In 1989-90, livestock still grazed much of the area along Cienega Creek but grazing did not uniformly affect the creek. Cattle predominately used downstream segments lightly in the winter and impacts were limited. Impacts were heavier in warm-season pastures along the southern half of the creek. Many segments lacked overstory vegetation, overhanging vegetation, or undercut banks. Floating vegetation (filamentous algae mats) was a common cover type due to increased nutrient levels and fewer shaded habitats. In many segments, shallower and wider habitats such as glides and riffles predominated over deeper pool habitats.

In limited reaches of Cienega Creek, pool habitats were well developed. These habitats were generally surrounded by marsh and had a high degree of cover. Such cover included: emergent vegetation, submerged vegetation, exposed roots from deer grass and trees, undercut banks, and medium and small woody debris. Proportions of habitat types changed drastically for all four segments between 1990 and 2000. Rather than lumping all four segments together for comparison, this discussion covers each segment separately because each has different characteristics that influence aquatic habitat development.

The Headwaters segment showed a decrease in the area of pools, yet the number and depth of pools increased (Tables 3-11 and 3-12). Run, riffle, and glide all decreased while marsh increased. This segment is the only one that is changing from a pool habitat to a marsh habitat. The number of pools has increased as has their depth, showing that not all pool habitats are in jeopardy of total replacement by marsh.

But the data show that shallow habitats (run, riffle, glide) are on the verge of total replacement by the encroachment of dense herbaceous aquatic vegetation. This segment showed a 10-fold increase in vegetation cover and 10-fold increase in overhanging cover (Table 3-13). Undercut banks dramatically increased in that none were detected in 1990. The processes in the Headwaters segment are driven mainly by the small watershed size (78 mi<sup>2</sup>) and lack of tributaries reaching higher elevations in nearby mountains where more rain falls. The sheltered existence of this segment from flood flows has produced an ecological site with fine sediments on shallow saturated banks and wide floodplains. The lack of disturbance of vegetation and bank soils from grazing has

**Table 3-10**  
**Riparian Proper Functioning Condition Assessment (PFC) Summaries for Empire-Cienega Riparian Areas**

Stream	1993 <sup>1</sup>					2000 <sup>2</sup>			
	Length (miles)	% PFC	% Functional at Risk	% Non-Functional	% Unknown	Length <sup>3</sup> (miles)	% PFC	% Functional at Risk	% Non-Functional
Cienega Creek	12.5	4	78	18	0	11.9	67	33	0
Empire Gulch	3.3	0	100	0	0	3.3	39	61	0
Gardner Canyon	1.3	0	0	100	0	1.3			
Mattie Canyon	1.2	0	100	0	0	1.2			
North Canyon	0.6	0	0	100	0	0	0	0	0
Cienega Canal	0.9	0	100	0	0	0.9	0	100	0
Mud Springs	0.3	0	0	0	0.3	0.3			
<b>TOTAL:</b>	<b>20.1</b>	<b>2</b>	<b>75</b>	<b>21</b>	<b>2</b>	<b>18.9</b>	<b>61</b>	<b>39</b>	<b>0</b>

<sup>1</sup> Based on 1993 riparian inventory data for Cienega Creek and 1989/90 riparian inventory data for other streams.

<sup>2</sup> From riparian proper functioning condition assessments completed in 2000.

<sup>3</sup> A total of 0.6 miles of Cienega Creek and 0.6 miles of North Canyon are no longer managed as riparian areas in 2000 due to lack of site potential.

**Table 3-11**  
**Change in Aquatic Habitat Surface Area by Segment for Cienega Creek, 1990 and 2000**

Segment	Pool (%)		Run (%)		Riffle (%)		Glide (%)		Marsh (%)	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
Headwaters (above Gardner Canyon (59M))	64.1	35.5	4.2	0.5	15.0	0.0	4.6	0.2	12.1	63.8
Below Mattie Canyon (59F)	5.0	66.0	5.9	10.8	39.6	3.1	37.0	17.3	12.5	2.8
Below Pump Canyon (59D)	29.7	51.6	0.0	16.8	28.2	1.3	42.1	29.4	0.0	0.8
Fresno to Apache Canyon (59B)	13.3	50.4	0.0	5.3	51.7	4.3	34.3	38.5	0.7	1.5

**Table 3-12**  
**Pool Habitat Development by Segment for Cienega Creek, 1990 and 2000**

Segment	Pools Per Mile (All)		Pools (>2' Deep) Per Mile		Percent of All Aquatic Habitat	
	1990	2000	1990	2000	1990	2000
Headwaters (Above Gardner Canyon) (59M)	61	79	32	43	64	36
Below Mattie Canyon (59F)	12	43	3	40	5	66
Below Pump Canyon (59D)	29	124	4	57	30	52
Fresno to Apache Canyon (59B)	12	112	0	0	13	50

**Table 3-13**  
**Some Key Aquatic Habitat Characteristics for Cienega Creek, 1990 and 2000**

Segment	Instream Cover Square Feet/Mile		Overhanging Cover Square Feet/Mile		Undercut Banks Running Feet/Mile	
	1990	2000	1990	2000	1990	2000
Headwaters (Above Gardner Canyon) (59M)	1,343	13,472	424	4,231	0.0	789
Below Mattie Canyon (59F)	27,388	3,819	741	3,941	0.0	538
Below Pump Canyon (59D)	3,344	5,176	469	7,362	0.0	750
Fresno to Apache Canyon (59B)	2,591	297	51,801	4,794	0.0	18

allowed dense accumulations of aquatic plants (e.g., deer grass, Spanish needles, Baltic rush, spike rushes), which filter out sediments and raise bank elevations.

These actions, in turn, leave water with an increased capacity for moving sediment where sediments such as substrates are exposed on the bottoms of pool and glide habitats.

As plant density increases, so does the resistance to water movement. This resistance decreases the water's energy to transport sediment. The clean water leaving these areas has a low sediment load when it reaches areas with less resistance to flow such as pools and glides. In this way the differential in channel roughness created by plants is causing

deposition of sediment where plants can root in shallow areas. This differential is also increasing bed scour where plants cannot establish in great densities, such as, in pools and glides. Glides may actually be converted to pools as they are excavated by floods changing the nature of the habitat.

The Headwaters segment has a low slope (about 0.5%) and lacks large flood flows and large sediment particles, such as cobble and rubble, to remove vegetation. Fencing the segment has also sheltered herbaceous vegetation and trees from disturbances by livestock.

The Mattie Canyon segment showed an increase in the area of pools as well as the number and depth of pools (Table 3-11 and 3-12). Over the



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10-year period, riffle and marsh habitat both decreased while run and glide habitats increased. In contrast to the Headwaters segment, the Mattie Canyon segment showed a 86% decrease in vegetation cover in open habitats but a five-fold increase in overhanging cover during the same 10-year period (Table 3-13). Undercut banks increased dramatically because none were detected in 1990.

In contrast to the Headwaters segment, the processes in the Mattie Canyon segment differ mainly because of a larger watershed size (202 mi<sup>2</sup>) and inputs from upstream tributaries that reach into higher elevations where more rain falls. Flood flows and sediment have produced ecological sites with a mixture of fine and coarse sediments on shallow banks and wide floodplains. Though the disturbance regime is much greater than for the Headwaters segment, dense accumulations of aquatic plants (e.g., deer grass, Spanish needles, Baltic rush, spike rushes) have developed on floodplains and to a lesser degree in the channels.

This denser vegetation on the floodplain filters sediments, raising bank elevations and increasing the water's capacity to move sediment. "Hungry" water can then scour exposed sediment, such as, the substrates of pool and glide habitats. In addition, increased woody debris along Cienega Creek allows flood waters to create areas of turbulence around logs and tree roots forming backwater pools. This habitat type was rarely found in 1990. In this way existing channel features, such as pools and glides, may be deepened while other locations remain shallow bound by root masses across the bottom of the channel or coarse sediment deposits on habitats such as runs and riffles. Although the Mattie Canyon segment has a low slope (about 0.5%), like the Headwaters segment, disturbance is increased by larger flood flows from a larger watershed and larger sediment particles, such as gravel and cobble, which can remove less durable components of

herbaceous vegetation. This greater capacity for disturbance coupled with a large degree of tree canopy (i.e., overstory), which shades the stream, has resulted in less herbaceous instream cover and increased cover overhanging the water's surface.

The Pump Canyon segment showed an increase in the area of pools and the number and depth of pools (Tables 3-11 and 3-12). Riffle and glide habitat both decreased while marsh habitat slightly increased. This segment also showed a 1.5-fold increase in vegetation cover in pools and a 16-fold increase in overhanging cover (Table 3-13). Undercut banks increased in that none were detected in 1990. The Pump Canyon segment functions much as the Mattie Canyon segment except that Pump Canyon has a slightly larger watershed (211 mi<sup>2</sup>) and an immature tree gallery that does not create the level of shade that limits herbaceous plant growth.

The Fresno Canyon segment showed an increase in area and number of pools (Tables 3-11 and 3-12). But depths remain relatively shallow. Run habitats increased while glide habitats remained relatively static. Marsh habitat doubled, yet still amounted to only 1.5% of all aquatic habitats. This segment showed a 89% decrease in aquatic vegetation cover over 10 years and a 91% decrease in overhanging cover. Undercut banks increased in that none were detected in 1990.

The Fresno Canyon segment functions much as do the Mattie Canyon and Pump Canyon segments except that Fresno Canyon has a slightly larger watershed (223 mi<sup>2</sup>) and a large load of coarse sediments. These coarse sediments create a filling and scouring dynamic that limits the developing of habitat and establishing of herbaceous aquatic plants. This segment also has a larger degree of disturbance than the other segments. This disturbance, coupled with a large degree of mature tree canopy (i.e., overstory) that shades the stream, has resulted in less herbaceous instream cover

and decreased cover overhanging the water's surface.

## **FISH AND WILDLIFE**

The quality and diversity of vegetation communities contribute to the planning area's value as wildlife habitat. Wildlife habitat attributes, including vegetation structure, plant species composition, and the presence or absence of physical features, determine wildlife presence and abundance in any given area. The high diversity of fish and wildlife species within the planning area results from the habitat diversity, including the presence of several rare plant communities (Table 3-14).

**Table 3-14  
Species Richness, Empire-Cienega Planning Area**

<b>Taxonomic Group</b>	<b>Number of Species</b>
Mammals	60
Birds	230
Reptiles and Amphibians	43
Fish	3
<b>TOTAL:</b>	<b>336</b>

The riparian areas along Cienega Creek and its tributaries provide breeding, foraging, watering, resting, and escape cover as well as travel corridors for a variety of wildlife. Riparian habitats are important to wildlife in desert environments. Although never abundant, these habitats in Arizona have also been dramatically reduced by a variety of human impacts. Many of the federally listed and other special status species, entirely or partially, depend on riparian habitats. The relatively large, high-quality

riparian habitats within the planning area have contributed to the presence of many special status species.

Three native fishes inhabit Cienega Creek and Mattie Canyon: the endangered Gila topminnow; the Gila chub--a federal candidate species--and the longfin dace. Lowland and Chiricahua leopard frogs, Sonoran mud turtles, and Mexican garter snakes inhabit several locations in Empire Gulch and Cienega Creek (Rosen 1996; BLM files). Lowland leopard frogs and Sonoran mud turtles can be found in Nogales and Little Nogales Springs and Wakefield Canyon. Incidental observations and literature reviews document the presence of six more species of amphibians and 33 species of reptiles within the planning area (See Appendix 3, Annotated Checklist of Fish, Amphibians, and Reptiles).

More than 230 bird species have been documented in the planning area including both resident and migratory species and such special status species as the gray hawk, osprey, Southwestern willow flycatcher, yellow-billed cuckoo, green kingfisher, and Baird's sparrow (See Appendix 3, Checklist of Birds). At least five species of raptors have been documented to nest in the riparian areas as well as great blue herons and many songbirds. Waterfowl use ponds and pools along the creek, and nesting Virginia rails have been found in the cienega habitat along its banks. The extensive open grasslands of predominately native grasses provide both breeding and wintering habitat for the rare grasshopper sparrow and wintering habitat for the Baird's sparrow. Both of these species are Arizona wildlife of special concern. These grasslands also provide foraging habitat for resident and migratory raptors, such as, the Swainson's and ferruginous hawks.

Also known to inhabit the area are 25 big-game, small-game, and predatory mammals; 27 small-

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mammal species, and eight bat species (See Appendix 3, Mammal Species).

The foothills of the Whetstone and Empire mountains, as noted by James Bartlett in 1852, once provided excellent habitat for pronghorn, mule deer, and white-tailed deer (Davis 1982). These species have been in decline due to human encroachment, drought, and reduction in natural water sources. Pronghorn were extirpated from southeast Arizona by the 1920s and were reintroduced in the planning area by the Arizona Game and Fish Department in 1981 (AGFD 1981). Recent surveys place the population at about 100, but survival of pronghorn fawns has been low in recent years (Sacco 1999). Mule deer populations have undergone regional declines, and both white-tail and mule deer have undergone changes in local distribution.

A variety of other mammals also inhabit the planning area. Cottontail are common in shrubby habitats and black-tailed jackrabbits occur in open habitats. Raccoon and porcupine are found most often in riparian areas. Coatimundi inhabit dry canyons and riparian areas. Ringtail are found on rocky hillsides, usually near crevices, caves, mine shafts, and abandoned buildings. Predatory mammals include the mountain lion, bobcat, coyote, and grey fox.

The endangered lesser long-nosed bat and the Mexican long-tongued bat (BLM sensitive) forage on agaves, which are present in varying densities on loamy hills ecological sites. Other bats are attracted to the abundance of insects along riparian areas.

### THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES

Thirty-seven special status fish, wildlife, and plant species occur or have the potential to occur within the planning area. Included are the following:

- 11 federal candidate, threatened, or endangered fish, wildlife, and plant species (Table 3-15).
- 15 species proposed to be listed as wildlife of special concern in Arizona (AGFD in preparation) (Table 3-16).
- 11 species classified as BLM sensitive (Table 3-17).

These special status species mainly inhabit the planning area's rare riparian and grassland habitats.

### Threatened and Endangered Fish and Wildlife Habitat Conditions and Inventory

#### *Lesser Long-Nosed Bat*

The lesser long-nosed bat, a federally listed endangered species, is a medium-sized nectar, pollen, and fruit eating bat that migrates seasonally from Mexico to southern Arizona and southwest New Mexico. This bat has a small triangular noseleaf, relatively small ears, and no tail. It ranges in southern Arizona from the Picacho Mountains southwest to the Agua Dulce Mountains, southeast to the Chiricahua Mountains, and south from Arizona throughout the drier parts of Mexico. The lesser long-nosed bat feeds on the fruits of columnar cacti and paniculate agave (USFWS 1988).

The lesser long-nosed bat roosts in caves and abandoned mines. The number of individuals per roost varies from a few to thousands. These

bats begin dispersing from maternity roosts in mid-July. From July through September on a transient basis they occupy a diverse series of roosts from high to low elevations. By late September these bats vacate Arizona and move into Mexico (USFWS 1988).

The planning area's loamy hills ecological sites support moderate to high densities of paniculate agaves, which are the main food source for migrating lesser long-nosed bats in late summer and early fall.

Simms and Dalton (1998) conducted a light-tagging study of lesser long-nosed bats in the planning area in September 1998. The objective of the study was to locate migratory day roosts of these bats. Another objective was to learn more about foraging territory and distances. During two nights of netting, the researchers captured and equipped 29 lesser long-nosed bats with chemiluminescent light tags. Observers tracked one of the bats to a known migratory roost in the Patagonia area, a distance of about 15 miles from the capture site. Other bats were documented foraging at hummingbird feeders in the planning area up to 15 miles from their capture location. The study found one new migratory roost. Several lesser long-nosed bat migratory roosts occur within 50 miles of the planning area.

### ***Jaguar***

The jaguar is the largest species of cat native to the Western Hemisphere and was recently listed as endangered in the United States. Jaguars are cinnamon-buff in color with many black spots. Melanistic forms are also known, mainly in the southern part of their range. Jaguar range in North America includes Mexico and portions of the Southwestern United States. A number of jaguar records are known from Arizona, New Mexico, and Texas (USFWS 1997a).

There are historic records of jaguar from the Santa Rita and Whetstone Mountains (Girmendonk 1994; Hoffmeister 1986) which border the planning area. Jaguar may use the planning area as a movement corridor, but confirmed sightings in the United States are extremely rare.

### ***Aplomado Falcon***

The aplomado falcon is a federally listed endangered species. It is a medium-sized falcon similar in size to the peregrine falcon. It has a moustache similar to the peregrine's but, unlike the peregrine, has a white line through its eye. When viewed from below, the aplomado falcon has a black belly contrasted by a pale throat and an orange-brown thigh. Aplomado falcons do not build their own nests but use abandoned nests of hawks and ravens. These falcons nest in small trees such as mesquite and catclaw. Their prey consists mainly of small birds but they may also eat winged insects, bats, rodents, and reptiles. Falcon distribution and reproduction may be influenced by available nest sites and abundance of small birds (USFWS 1990).

Aplomado falcons inhabit grasslands and savannas of Latin America. They formerly inhabited desert grasslands and coastal prairies of Texas, New Mexico, and southeast Arizona. In the United States, historic habitats consist of open grasslands with scattered yuccas and mesquites. The species will also occupy oak savannas, pine savannas, desert grasslands, and riparian woodlands (USFWS 1990). The aplomado falcon is one of six desert grassland priority species named in the Arizona Partners in Flight Bird Conservation Plan (Latta et al. 1999).

Corman (1992) surveyed the planning area for potential reintroduction sites for the northern aplomado falcon.

**Table 3-15  
Federally Listed or Candidate Species with Historic or Current Occurrences in the  
Cienega Creek Basin**

<b>Name</b>	<b>Federal Status</b>	<b>Habitat and Presence</b>
Gila topminnow ( <i>Poeciliopsis occidentalis occidentalis</i> )	FE	Pools, cienegas, backwaters, seeps, and springs. Present in Cienega Creek, Empire Gulch, and Mattie Canyon
Gila chub ( <i>Gila intermedia</i> )	FC	Deep pools with overhanging banks/cover. Present in Cienega Creek and Mattie Canyon.
Desert pupfish ( <i>Cyprinodon macularius</i> )	FE	Small, shallow pools, cienegas, backwaters, seeps, and springs. Historically present in the Santa Cruz and San Pedro river drainages. One reintroduced population is present in pond on private land within planning area. Proposed for reintroduction.
Chiricahua leopard frog ( <i>Rana chiricahuensis</i> )	FP	Pools in stream channels and isolated pools at seeps and springs. Present recently in Cienega Creek, Empire Gulch, Mattie Canyon, and off-channel ponds. Declining numbers. Proposed for listing as threatened species.
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	FT	Large, open bodies of water for foraging; large trees or snags or cliffs for nesting. Transient in planning area.
Northern aplomado falcon ( <i>Falco femoralis septentrionalis</i> )	FE	Open grassland habitats with scattered trees/yucca for nesting and perches. Extirpated.
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	FE	Dense willow and cottonwood habitats along streams with perennial water. Migratory individuals documented <del>but no breeding pairs confirmed in planning area.</del> <b>for several years of record. One breeding pair successfully nested along Cienega Creek in 2001.</b> Suitable habitat is present along Cienega Creek.
Lesser long-nosed bat ( <i>Leptonycteris curasoae yerbabuena</i> )	FE	Forages on agave in upland grassland habitats. Confirmed presence in planning area.
Jaguar ( <i>Felis onca</i> )	FE	May use dense vegetation in river bottoms for foraging and travel corridors. Historical records from mountains next to planning area but no current records.
Canelo lady tresses orchid ( <i>Spiranthes delitescens</i> )	FE	Present in drainages near planning area but not documented along Cienega Creek or tributaries.
Huachuca water umbel ( <i>Lilaeopsis schaffneriana</i> ssp. <i>recurva</i> )	FE	Early successional species requiring periodic flooding and opening of streamside habitat and sand deposition. Has been found in Empire Gulch <b>and along Cienega Creek.</b>

FE = Federally listed as endangered.

FC = Candidate for federal listing. All species are also on the wildlife of special concern in Arizona (WSCA) list, (draft) Arizona Game and Fish Department.

FP= Proposed for federal listing.

FT = Federally listed as threatened.

**Table 3-16**  
**Proposed Wildlife of Special Concern in Arizona Occurring or Likely to Occur in the**  
**Empire-Cienega Planning Area**

<b>Name</b>	<b>Habitat</b>	<b>Presence</b>
Mexican garter snake ( <i>Thamnophis eques</i> )	Perennial stream segments and marshes along Cienega Creek and tributaries.	PC
Bunch grass lizard ( <i>Sceloporus scalaris</i> )	Desert grassland.	PL
Lowland leopard frog ( <i>Rana yavapaiensis</i> )	Perennial streams, springs, and pools within Cienega Creek watershed.	PC
Azure bluebird ( <i>Sialia sialis fulva</i> )	Oak woodland, mainly in winter.	PL
Yellow-billed cuckoo ( <i>Coccyzus americanus</i> )	Cottonwood-willow riparian areas along Cienega Creek and tributaries.	PC
Ferruginous hawk ( <i>Buteo regalis</i> )	Occasional visitor, foraging in grassland habitats.	PC
Northern goshawk ( <i>Accipiter gentilis</i> )	Vagrant, usually dense coniferous forest.	PC
Swainson's hawk ( <i>Buteo swainsoni</i> )	Regular breeder, grassland habitats.	PC
Green kingfisher ( <i>Chloroceryle americana</i> )	Perennial streams, rare to regular visitor.	PC
Sprague's pipit ( <i>Anthus spragueii</i> )	Desert grassland, open valley bottoms.	PC
Baird's sparrow ( <i>Ammodramus bairdii</i> )	Desert grassland swales.	PC
Arizona grasshopper sparrow ( <i>Ammodramus savannarum ammolegus</i> )	Desert grassland swales. Summer breeding population of particular concern.	PC
Western red bat ( <i>Lasiurus blossevillii</i> )	Cottonwood willow riparian areas along Cienega Creek and tributaries.	PC
Townsend's big-eared bat ( <i>Plecotus townsendii</i> )	Roosts in caves/mines, forages on insects in uplands or over water.	PC
Black-tailed prairie dog ( <i>Cynomys ludovicianus</i> )	Open, desert grasslands.	EX

PC = Presence Confirmed. PL = Presence Likely. EX=Extirpated.

**Table 3-17**  
**BLM Sensitive Species Within Empire-Cienega Planning Area**

<b>Name</b>	<b>Habitat</b>	<b>Presence</b>
Longfin dace	Pools and riffles in perennial streams.	PC
Texas horned lizard	Desert grassland.	PC
Gray hawk	Cottonwood willow galleries next to mesquite woodland. Population increasing in planning area.	PC
Burrowing owl	Open grassland in association with black-tailed prairie dog or kangaroo rat mounds.	PL
Loggerhead shrike	Grassland, open habitats.	PC
Cave myotis	Roosts in large numbers in caves/mines and forages on insects in uplands and over water.	PC
Fringed myotis	Roosts in large numbers in caves/mines and forages on insects in uplands and over water.	PC
California leaf-nosed bat	Roosts in large numbers in caves/mines and forages on insects in uplands and over water.	PC
Mexican long-tongued bat	Roosts may vary from crevices to caves, usually small numbers. Forages on nectar from agaves and other plants.	PC
Huachuca golden aster ( <i>Heterotheca rutteri</i> )	Open grassland, disturbed and undisturbed sites. Documented at one locale within planning area but much more potential habitat exists.	PC
Needle spined pineapple cactus ( <i>Echinomastus [= Neolloydia] erectocentrus</i> var <i>erectocentrus</i> )	Open sites dominated by desert grassland, chaparral, or mixed shrub vegetation on soils derived from limestone alluvium.	PL

PC = Presence Confirmed. PL = Presence Likely.

Three transects were surveyed and rated suitable for potential reintroduction. One transect was along Cienega Creek and two were in Fortynine Wash. The planning area was considered to be the best of several potential reintroduction sites in Arizona.

***Bald Eagle***

The bald eagle was recently down-listed from endangered to threatened. Adult bald eagles are large birds with white heads and tails. Immature bald eagles are dark brown with varying degrees of white molting. Their feet and legs are bare of feathers. Bald eagles require large trees, snags,

or cliffs within 13 miles of water for nesting, with abundant fish and waterfowl for prey. Fish is their main food source, but waterfowl, small mammals, and carrion are also important food items for breeding, wintering, and transient eagles. Bald eagles breed and migrate through northern and central Arizona, but mainly winter and migrate in southern Arizona.

The planning area does not provide suitable habitat for bald eagles because it lacks large riverine, lake, or reservoir habitats which provide prey species and nesting substrates. Although transient bald eagles occasionally may

visit the planning area, regular visits are considered unlikely.

### ***Southwestern Willow Flycatcher***

The Southwestern willow flycatcher is a federally listed endangered species. It is a small, migratory, and riparian obligate bird that nests along rivers, streams, and other wetlands, where dense growths of willow, buttonbush, boxelder, tamarisk, or other plants are present, often with a scattered overstory of cottonwood and/or willow. This species is an insectivore, foraging within and above dense riparian vegetation, taking insects on the wing or gleaning them from foliage (USFWS 1993b).

Southwestern willow flycatchers begin arriving on breeding grounds in late April and May. They begin nesting in late May and early June and fledge young from late June through mid-August. They nest in thickets of trees and shrubs 13 to 23 feet tall, with a high percentage of canopy cover and dense foliage from 0 to 13 feet above ground. The plant community at nest sites is typically even-aged, structurally homogeneous, and dense (USFWS 1993b). The Southwestern willow flycatcher is one of four bird species named as low-elevation riparian priority species in the Arizona Partners in Flight Bird Conservation Plan (Latta et al. 1999).

In 2000, BLM completed an inventory of Southwestern willow flycatcher habitat along Cienega Creek and Empire Gulch. The inventory found four miles of Cienega Creek having suitable habitat and 9.5 miles of Cienega Creek and Empire Gulch having potential habitat (See Appendix 3, Willow Flycatcher Habitat Assessment and Surveys). Much of the potential habitat consisted of relatively even-aged stands of willows that had matured to the point where they lacked sufficient density of understory vegetation. Some type of disturbance to open up these areas to new growth is probably needed to return them to

suitable habitat, which is an earlier successional stage.

**In the 2001 breeding season, the BLM contracted for willow flycatcher surveys using established protocols along the suitable reaches of Cienega Creek. These surveys detected the presence of one breeding pair along Cienega Creek which successfully fledged at least one young (BLM files).**

A volunteer bird-banding project captured migrant willow flycatchers in 1988, 1989, 1990, 1992, and 1993 along the Agricultural Field portion of Cienega Creek (under Master Permit 29108). The project captured no willow flycatchers in breeding status. And willow flycatcher surveys using established protocols along several reaches of Cienega Creek in 1994 found none of these birds (See Appendix 3) . The Agricultural Fields section of Cienega Creek (Segment 59I) was re-surveyed in 1998-2000 for a stream restoration project, but again no willow flycatchers were detected.

### ***Chiricahua Leopard Frog***

The Chiricahua leopard frog is proposed for federal listing as a threatened species. It is a medium-sized frog from 2.5 to 4 inches long having on the rear of its thigh a distinctive pattern of small, raised, cream-colored spots or tubercles on a dark background. These frogs occur in Santa Cruz, Apache, Gila, Pima, Cochise, Greenlee, Graham, Yavapai, Coconino, and Navajo counties at elevations from 3,000 to 8,300 feet. They inhabit a wide variety of aquatic habitats, including streams, rivers, backwaters, cienegas, ponds, and stock tanks that lack bullfrogs and non-native fish. They prefer habitats with permanent water. Adults are typically active from April until November, often breeding after seasonal rains (USFWS 2000; Stebbins 1966).



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Like other leopard frogs, Chiricahua leopard frogs have experienced alarming declines in recent years. Surveys from 1983 through 1987 found Chiricahua leopard frogs in only 2 of 36 sites where the species had previously been recorded (Clarkson and Rorabaugh 1989). The species can be described as declining, low in number, and limited to a few locations. Major threats to the species include predation, possible competition with non-native aquatic species, and loss or altering of aquatic habitats (USFWS 2000).

Both lowland and Chiricahua leopard frogs have been found in several locations in the planning area including: Cienega Creek, Empire Gulch, Mattie Canyon, and off-channel ponds (BLM files; Rosen 1996). BLM biologists routinely captured leopard frogs (tadpoles and adults) while surveying aquatic habitats and sampling fish in Cienega Creek during the early 1990s. Since that time leopard frogs have been found much less often although habitat for both species has increased in Cienega Creek within the last ten years.

#### ***Gila Topminnow and Gila Chub***

The Gila topminnow, a federally listed endangered species, is a small fish (less than two inches long) inhabiting river basins in Arizona, New Mexico, and Sonora, Mexico. This fish typically inhabits lower elevation (below 1,500 m.) springs, streams, and the margins of larger water bodies, where it shows an affinity for emergent or aquatic vegetation. The species tends to congregate in shallow waters or near the surface of deeper ones. Where cold temperatures occur regularly, Gila topminnows are generally restricted to waters that do not freeze, such as, constant-temperature springs or areas fed or influenced by these springs (Schoenherr 1974).

Gila topminnows feed on organic detritus, algae, and other plants and on invertebrates, such as,

crustaceans and insects including the larvae of mosquitos. They give birth to live young. The number of young varies with the fluctuating habitat conditions and size of the adults (Schoenherr 1974)

A candidate for federal listing, the Gila chub is a large minnow that grows as large as 7-8 inches long. Gila chub feed on small insects, small fish, and algae, and occupy smaller streams and cienega-type habitats. They are a highly secretive fish and live in deeper water or near cover (Griffith and Tiersch 1989).

Gila chub are found only in the Gila River basin and historically occurred in springs and small streams in Arizona, New Mexico, and Sonora. Today, they are found in fewer than 15 streams in central and southern Arizona and are abundant at no more than 10 of these locations (Griffith and Tiersch 1989).

Considered the finest remaining natural habitat for the endangered Gila topminnow, Cienega Creek was classified as Category 1 habitat by the Arizona Game and Fish Department (Simons 1987). Cienega Creek also has one of the largest remaining populations of Gila chub. Cienega Creek is particularly significant in that it has no exotic fish species. Recent expansions of bullfrogs within the watershed and their presence in Cienega Creek are raising concerns about possible impacts to native fish and leopard frogs.

Fish inventories of Cienega Creek and its tributaries, Mattie Canyon and Empire Gulch, have been conducted since 1989 by seining, electrofishing, and visual observation. Topminnow populations vary widely from season to season and year to year. In 1989, the estimated fall population of Gila topminnow was 2.5 million, conservatively (Simms and Simms 1992).

Upper Cienega Creek above Gardner Canyon is relatively isolated from large sediment loads and large floods. Thermal fluctuations along this reach are moderated by incoming groundwater which adds a stable temperature to the surface flow. Nonetheless, topminnow populations fluctuated greatly. Topminnow density ranged from 0.5 to 101 per 10 ft<sup>2</sup> during 1989-1997, but was generally above 20 fish per 10 ft<sup>2</sup> (Table 3-18). The reduction of topminnow numbers in the fall of 1993 was most likely a result of intense flooding, estimated to have exceeded a 100-year flood.

In Cienega Creek below Gardner Canyon sediment input and flood flows increase. Habitats fluctuate more and pools seem transient. Thermal conditions are more variable except at the confluence with Mattie Canyon where groundwater moderates the fluctuation in water temperatures. Topminnow densities fluctuate greatly. The number of topminnow ranged from 0.82 to 18 per 10 ft<sup>2</sup> (Table 3-18). The unusually cold winter of 1989/1990 may have greatly reduced topminnow numbers in Lower Cienega Creek. Five sites were compared in the fall of 1989 with those in the late winter of 1990. The Headwaters site showed a 303% increase in topminnow numbers from fall to late winter. The other sites showed an 87-99% decrease in topminnow numbers. Observations over two winters found that topminnows suffer substantial mortality when temperatures fall below 10°C. At Headwaters Spring, the warmer groundwater during the harsh winter may have provided a refugium for the Gila topminnow. Topminnow numbers similarly declined in 1993, when extreme flooding for more than a week scoured the lower reaches of Cienega Creek. Flooding reduced the Cienega Creek topminnow population in the upper creek, but the upper creek still had densities 10 times that of the lower creek. The composition of the fish community in Cienega Creek varies from its upper to lower reaches as

well as from year to year. Topminnow make up more than 90% of the fish community in some years, but averaged 78% during the 8 years of record. Longfin dace composed up to 57% of the fish community with an average of 21% (Table 3-19). Fish sampling is difficult in Cienega Creek because of the large volume of vegetation cover, great pool depths, and undercut banks. Seining data reflect only the relative abundance for two fish species because Gila chub are effectively captured only by electrofishing. But seining did produce a substantial number of juvenile chub (<90mm TL), showing that these fish are reproducing at an acceptable level for recruitment (Table 3-19). Visual observations and electrofishing data show that a large population of adult Gila chub occupies all perennial segments of Cienega Creek. Visual observations of adult Gila chub, made for the aquatic habitat inventory in 1989-1990 found 368 chub along the perennial length of Cienega Creek. This estimate is undoubtedly low due to water turbidity in some reaches, vegetation cover, and the secretive nature of Gila chub.

Mattie Canyon supports typical riffle-pool type habitat with large numbers of longfin dace and Gila chub. Gila topminnow occur in small localized groups and are generally uncommon in this tributary.

Empire Gulch supports a marsh habitat with a few large, deep pools that support mud turtles and leopard frogs. Gila topminnow have also been recorded in Empire Gulch near its confluence with Cienega Creek. Although isolated from Lower Empire Gulch by several miles of dry streambed, except during flooding, Upper Empire Gulch Spring has been found to have suitable habitat for reintroducing Gila topminnow. An environmental analysis is being completed for a reintroduction effort.

**Table 3-18**  
**Population Trend Data Collected During 1989-1996 for Gila Topminnow**  
**Along Upper and Lower Cienega Creek**

Upper Cienega Creek (above Gardner Canyon)				Lower Cienega Creek (below Gardner Canyon)			
Year	̄/10ft <sup>2</sup>	Range	# Sites	Year	̄/10ft <sup>2</sup>	Range	# Sites
1989	21.2	--	1	1989	10.90	0.04-29	5
1990 W	58.5	2.80-114.0	2	1990 W	1.10	0.00-6.5	12
1990 F	0.5	--	1	1990 F	4.10	3.80-4.4	2
1992	101.5	--	1	1992	18.00	0.80-26.2	3
1993	10.2	6.40-13.9	2	1993	0.82	0.00-3.6	6
1994	31.7	0.78-62.0	2	1994	7.10	1.40-20.2	6
1995	53.2	13.8	2	1995	11.20	0.08-33.0	5
1996	No Data	--	--	1996	10.90	2.10-18.1	6
1997	15.8	9.5-22.0	2	1997	--	--	--

Trend from catch per unit area, one pass seining, at several sample sites. Only pool and glide habitats sampled. Sampled in fall except for 1990, which was sampled in late winter (W) and fall (F).

**Table 3-19**  
**Relative Abundance of Fish Collected During 1989-1997 for Cienega Creek, Pima County, AZ**

Cienega Creek Seining Data						
Year	# Sites Sampled	Percentage of Fish Community			TOTAL	
		Gila Topminnow	Longfin Dace	Gila Chub - Mainly Juveniles		
1989	6	92.0	7.6	0.4	100	
1990W	12	78.5	21.4	0.1	100	
1990F	3	75.5	24.4	0.1	100	
1992	4	86.4	13.5	0.1	100	
1993	8	41.6	57.5	0.9	100	
1994	8	82.5	16.4	0.1	100	
1995	7	91.4	8.1	0.5	100	
1996	7	78.4	21.2	0.4	100	
MEAN% (Std.Dev.)		78.4 (16)	21.3 (16)	0.3 (0.3)	100	

Seining data based on multiple passes until site was depleted. Only pool and glide habitats were sampled. Sampled in fall except for 1990 when sampled in late winter (W) and fall (F).

Cinco Canyon has seven natural ponds, five of which are perennial. These shallow ponds do not support fish but do support Sonoran mud turtles, breeding rails, breeding ducks, and leopard frogs. The ponds have been proposed as potential reintroduction sites for Gila topminnow.

In 1988 the Arizona Game and Fish Department reintroduced Gila topminnow into Nogales and Little Nogales Springs near Wakefield Canyon, another tributary to Cienega Creek. These transplants appear to have failed, but these springs still provide habitat for future reintroductions (Weedman and Young 1995).

### ***Desert Pupfish***

The desert pupfish, federally listed as endangered, is a small (1.5 inch long) desert fish that inhabits springs, seeps, shallow pools, and backwaters in the Colorado River and Rio Sonoyta drainages (Schoenherr 1988; USFWS 1993a). Pupfish feed on small crustaceans, insects, and other invertebrates; worms; mollusks; aquatic macrophytes and algae; and detritus. These fish reproduce when water temperatures exceed 20°C. Males are territorial and may spawn with several females. Desert pupfish only inadvertently care for their eggs and young as a result of their relentless habit of driving out other male pupfish and other fish species from their territories.

One reintroduced population is present in a pond on private land within the planning area. Pupfish are being considered for possible reintroduction in the planning area, but no specific sites for reintroduction have been evaluated.

### **Special Status Fish and Wildlife Habitat Conditions and Inventory**

BLM has not conducted specific surveys or evaluated habitat conditions for many of the

Arizona wildlife of special concern or recently listed BLM sensitive species that occur or are likely to occur in the planning area. Studies by other agencies or independent researchers have produced information on occurrences or habitat for some of these species. (Appendix 3, Special Status Species Summaries, briefly summarizes the habitat requirements and distribution of these species).

### ***Lowland Leopard Frog, Mexican Garter Snake, and Longfin Dace***

Occurrence data and some habitat data for lowland leopard frog and Mexican garter snake (both Arizona wildlife of special concern) and long-fin dace (BLM sensitive) have been collected during the surveys and habitat monitoring for Gila topminnow and Gila chub (BLM files).

### ***Yellow-Billed Cuckoo***

The yellow-billed cuckoo is an Arizona wildlife of special concern and is one of four bird species named as low-elevation riparian priority species in the Arizona Partners in Flight Bird Conservation Plan (Latta et al. 1999). Surveys for yellow-billed cuckoo were conducted along portions of Cienega Creek in 1998-1999 (Corman and Magill 2000). In 1998, 14 pairs of cuckoos were detected along 14 km of survey, representing 19.2% of Arizona's population of cuckoos. In 1999, 12 pairs of cuckoos were detected along 15 km of survey, representing 7.3% of Arizona's population of cuckoos.

### ***Gray Hawk***

The gray hawk is a BLM sensitive species that nests in cottonwood-willow riparian areas next to dense patches of mesquite woodland. BLM biologists surveyed raptor nests along Cienega Creek and Empire Gulch in 1989 and 1991. One pair of nesting gray hawks was detected during these surveys and since then has been confirmed to nest in the same general area every year. In 1999, three pairs of nesting gray hawks

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were detected showing an expansion in the breeding population (BLM files).

#### ***Baird's Sparrow and Grasshopper Sparrow***

The Baird's sparrow and Arizona grasshopper sparrow are both Arizona wildlife of special concern and are two of the six bird species named as desert grassland priority species in the Arizona Partners in Flight Bird Conservation Plan (Latta et al. 1999). Populations of both species are in serious decline in the United States. The Arizona grasshopper sparrow is a local breeding race with a very limited breeding distribution in southeast Arizona. The population is supplemented with individuals from northern subspecies during winter. Baird's sparrow has undergone statistically significant declines in population in the last 30 years (Krueper 2000).

Researchers are studying habitat relationships of both sparrow species at study sites in the planning area. A stable population of wintering Baird's sparrow and a small stable population of breeding Arizona grasshopper sparrows are present at the area's southern end. Enough habitat quantity and quality seem to be present to maintain these populations. Both species seem to tolerate low to moderate grazing within their habitats. But heavier grazing (or even low-to-moderate grazing in drought years) can degrade habitat condition and cause a loss of preferred microhabitats for nesting or thermal cover (Krueper 2000).

#### **Threatened, Endangered and Other Special Status Plants**

Although the planning area has a high diversity of plants, only four are considered of special concern for management:

#### ***Needle Spined Pineapple Cactus***

The needle spined pineapple cactus (*Echinomastus* [= *Neolloydia*] *erectocentrus*

*erectocentrus*) is a former Category 2 federal candidate and now a BLM sensitive species found in eastern Pima, southeast Pinal, and Cochise counties. This plant is distributed generally from Vail east to the Little Dragoon Mountains and south to the Mule Mountains. Typically it grows on open sites dominated by desert grassland, chaparral, or mixed shrub vegetation. Most of the planning area north of the narrows appears to be suitable habitat for the species which grows on bajadas and soils derived from limestone alluvium at 3,000 to 5,000 feet in elevation. But no surveys for this species have been conducted (USFWS 1992).

#### ***Huachuca Golden Aster***

The Huachuca golden aster (*Heterotheca rutteri*) is a BLM sensitive species that grows at 4,000 to 5,000 feet in elevation, almost exclusively in the open grassland. It grows at both disturbed and undisturbed sites with a preference for flat areas. It has been found mainly in the grasslands that abut the Huachuca, Patagonia, and Santa Rita Mountains, and the San Rafael Valley at the headwaters of the Santa Cruz River. In 1997, the Huachuca golden aster was found in the planning area in the West Pasture on the Empire-Cienega allotment. The planning area has much more grassland that is potential habitat for the species, but surveys for the species have not been conducted in these areas (USFWS 1992).

#### ***Huachuca Water Umbel***

The Huachuca water umbel (*Lilaeopsis schaffneriana* ssp. *recurva*) is federally listed as endangered. It is a herbaceous semi-aquatic perennial with slender pale green erect leaves growing from nodes of creeping shallow rhizomes, which branch freely and may form dense mats making individual plants hard to distinguish. Tiny flowered umbels arise from root nodes. The flowers are 1 to 2 millimeters

wide with tiny maroon-tinted petals. Flowering has been observed from March through October (USFWS 1997b).

The Huachuca water umbel requires perennial water, gentle stream gradients, small to medium sized drainages, and apparently mild winters. It is usually found in water from 2 to 16 inches deep. A moderate flood frequency and the associated level of disturbance to other plant species are required to maintain the ecological niche for this species. But floods that are too frequent or intense can destroy populations. These plants are found in both unshaded and shaded sites. Associated plants include willows, alder, cottonwood, cattails, bulrushes, sedges, rushes, grasses, and watercress (USFWS 1997b).

The Huachuca water umbel has been found in Empire Gulch near its confluence with Cienega Creek **and in Cienega Creek near the confluence with Empire Gulch.** Potential habitat for the species is also found along Cienega Creek and Mattie Canyon.

### ***Canelo Lady Tresses Orchid***

The Canelo lady tresses orchid (*Spiranthes delitescens*) is a newly described species that, because of its rarity, has been federally listed as endangered. It is known only from three locations in Santa Cruz and Cochise counties in the San Pedro watershed. The orchid has linear-lanceolate grass-like leaves and a flowering stalk that is about 50 cm tall. The flower stalk contains about 40 white flowers positioned in a spiral at the top of the stalk. This orchid flowers from late July to early August when temperatures range from 60°F at night to 100°F during the day. During that time, precipitation averages 15 to 20 inches (USFWS 1997b).

Canelo Hills lady tresses grows in cienegas and needs finely grained, highly organic, saturated soils. It is found intermixed with tall grasses and

sedges at about 5,000 feet in elevation. The associated plant species include *Bidens*, *Carex*, *Juncus*, *Eleocharis*, *Typha*, and *Equisetum*. This species has not been found in Cienega Creek but does occur in other drainages nearby (USFWS 1997b).

## **VISUAL RESOURCES**

Visual resource management (VRM) is a process BLM uses to identify and manage scenic quality and to reduce the impact of development on the scenery. The VRM system does the following:

- Evaluates the quality of existing scenery.
- Considers the distance from which that scenery is viewed.
- Looks at people's sensitivity to changes in the landscape.

To manage visual resources, management classes have been developed to describe the degree of landscape modification permissible (See Appendix 2, Visual Resource Management Classes).

Most of the Empire-Cienega Planning Area falls into a VRM Class II which describes a landscape that is largely unmodified and scenic. Highway 83, which runs along the planning area boundary and crosses the planning area for 2 miles, is a designated scenic route in Arizona's State Highway System. The viewshed or scenery from Highways 82 and 83 and the main ranch road includes undisturbed panoramas of rolling grasslands with an average elevation of 4,500 feet against the dramatic backdrops of the mountain sky islands of Coronado National Forest: the 9,400 foot summit of Mt. Wrightson in the Santa Rita Mountains to the west and the 7,700 foot summit of Apache Peak in the Whetstone Mountains to the east; to the

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southeast is the distinctive hump of 6,300-foot Biscuit Mountain in the Mustang Mountains; to the north and south are the more gentle vistas of the Empire Mountains and the Canelo Hills.

The riparian vegetation of Cienega Creek and oak woodlands in other drainages create a dramatic green belt that magnifies the overall scenic quality of the rolling grass and oak- and agave-covered hills and offers sharp contrast to nearby views of desert scrub. Along Cienega Creek, however, is a limited area that farming has visually degraded.

Some vantage points along the interior roads of the planning area reveal arroyo cutting, abandoned water diversion structures, a 0.25-mile-long abandoned dirt airstrip, heavily trampled livestock watering holes, badlands topography, old dumps, and cut mesquite bosques. But these features do not detract from the planning area's overall scenic quality.

A one-mile segment of Empire Gulch near the historic Empire Ranch headquarters consists of a visually spectacular Fremont cottonwood gallery forest. Views from the historic ranch house, especially the breezeway and bay window, are generally unspoiled except for the Doplar radar tower in the Empire Mountains and the abandoned airstrip, which is occupied 5 to 10 times a year with small (1-20 vehicles) to large (20-70 vehicles) groups for periods of up to two weeks.

## PALEONTOLOGICAL RESOURCES

Although no vertebrate fossil sites have been found in the planning area, several are located nearby. The fossilized remains of a previously unknown dinosaur species, *Sonorasaurus thompsoni*, were recently found near Sonoita. The bones of a late Pleistocene elephant have

been reported in the Elgin School locality. And the remains of a Pleistocene horse were documented in the Empire Mountains. Similar sites may exist in the planning area. The planning area may also have invertebrate fossil deposits.

## CULTURAL RESOURCES

In this plan the term cultural resources refers to nonrenewable remnants of the human past and definite locations of traditional cultural or religious importance to specific cultural groups.

Cultural resources documented in the planning area proper consist mainly of prehistoric, protohistoric, and historic archaeological sites and historic structures representing four cultural groups: Archaic/Early Agricultural, Hohokam, Sobaipuri, and Anglo-American. Cultural resources that are documented at nearby sites and that may exist in the planning area represent four other cultural groups: Paleo-Indian/Clovis, Apache, Spanish, and Mexican.

## HUMAN OCCUPATION AND CULTURAL PROPERTIES

### Paleo-Indian/Clovis (ca. 10,000 B.C. to 5,500 B.C.)

To date, no evidence of Paleo-Indian/Clovis presence has been recorded in the planning area. But the bones of a late Pleistocene elephant recorded at a site near Elgin and those of a Pleistocene horse found in the Empire Mountains suggest that the types of big game animals killed by Clovis hunters in the nearby San Pedro Valley could have inhabited the planning area. If Clovis people did visit the planning area, it may have been at about the same time that they were hunting Pleistocene animals in the San Pedro Valley.

**Archaic/Cochise/Early Agricultural  
(ca. 5,500 B.C. to A.D. 200)**

Archaeologists do not know when humans first appeared in the planning area. The oldest evidence to date of human habitation in the planning area was recovered from two late Archaic pithouse village sites during excavations by archaeologists from the University of Arizona and the Arizona State Museum. Carbon-14 dating reveals that these sites were inhabited about 3,500 years ago by people who cultivated maize, squash, and beans. These foods supplemented a diet based on collected food products from wild plants, such as agave, lambs' quarters, amaranth, prickly pear, Emory oak, and mesquite, and on a variety of game, such as deer, pronghorn, bighorn sheep, and rabbits (Eddy and Cooley 1983; Huckell 1990).

Many other Archaic sites have been documented in the planning area but none have been dated. Some may represent an early Archaic culture known in southern Arizona as the Cochise. The Cochise based their subsistence on hunting and gathering and may have been among the earliest people in the Southwest to cultivate maize (corn). The Archaic sites in the planning area may provide important information about the transition from economies based on hunting and gathering to cultivation of domestic plants (Bronitsky and Merritt 1986; Eddy and Cooley 1983; Huckell 1990; Reid and Doyle 1986; Swanson 1951).

**Hohokam (ca. 300 B.C. to A.D. 1450)**

Archaeologists do not agree on the origin of the Hohokam culture. Some argue that this culture was a transformation from the late Cochise and occurred in the deserts and river valleys of southern Arizona and northern Mexico. Others maintain that the Hohokam culture was brought into Arizona during a rapid migration of people

from northern Mexico. The Hohokam based their economy on cultivating maize, beans, and squash, and "encouraged" some wild plants such as agave, yucca, lambs' quarter, panic grass, and amaranth to grow by tending them much as they did their domestic crops. Rounding out the Hohokam diet were such game meat as deer, pronghorn, bighorn sheep, and rabbits and such wild plant foods as mesquite pods, cholla buds, and a variety of seeds.

Many Hohokam habitation and resource use sites have been documented in the planning area. Cultural materials found at these sites show that the Hohokam were present by around A.D. 500 and that they cultivated crops of maize and bean along the planning area's streams. They also harvested wild plant foods in both riparian and upland areas and hunted local animals and birds. Hohokam farmers in the planning area may have arranged systematically placed rock circles around the base of individual agave plants to collect and conserve water. Agave hearts were roasted in pits and then eaten. We do not know how long the Hohokam lived in the planning area (Bronitsky and Merritt 1986; Eddy and Cooley 1983; Huckell 1990; Reid and Doyle 1986; Swanson 1951).

**Sobaipuri (ca. A.D. 1450 to 1770)**

Pottery sherds tentatively identified as being of Sobaipuri origin have been found at several sites in the planning area. These sherds may represent pottery made by Sobaipuri who actually lived at these sites. Or, these sherds may be fragments of vessels acquired from Sobaipuri living elsewhere and brought to these sites by late Hohokam inhabitants. Jesuit Father Eusebio Kino's journals describe a Sobaipuri settlement of about 500 people established in 1698 near the headwaters of Sonoita Creek, a few miles southeast of the planning area. The Jesuits referred to this settlement as Los Reyes de Sonoitac. In 1951, Charles Di Peso



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excavated a Sobaipuri habitation site a short distance south of the planning area. Whether Sobaipuri Indians from these settlements were somehow involved with sites in the planning area is not yet known.

During the Spanish colonial period several Sobaipuri villages were located along the San Pedro River and the lower reaches of the Babocomari River. By the early 1770s, Apache raids had forced most Sobaipuri to relocate to the Santa Cruz Valley.

Sobaipuri subsistence was based on cultivating domestic plants, collecting wild plant foods, and hunting. The Sobaipuri readily accepted livestock, domestic plants, and agricultural innovations introduced to them by Father Kino and later Spaniards (Bronitsky and Merritt 1986; Bolton 1948; Di Peso 1953; Seymour 1989; Sheridan 1995).

#### **Western Apache (ca. A.D. 1693 to 1873)**

The planning area lies in what was once territory claimed by the Western Apache Indians. One of the earliest historic references to the Apache dates to 1541. At that time Spanish explorers found living on the southern plains of New Mexico a nomadic people to whom they referred collectively as the Querecho. Later these people became known as the Apache.

Before the Pueblo Indian revolt against the Spanish in 1680, most Indians in the Southwest had only limited access to horses. During the revolt the Pueblos took thousands of horses from the Spaniards. Many other horses escaped into the wilds where they were captured by Indians. After the revolt, many Indian tribes, including the Apache, rapidly adapted the use of horses into their cultures. With horses the Apache became highly mobile and rapidly expanded their territories.

Father Kino's records mention the appearance of Apaches north of the present day Gila River in 1693. Historic documents thereafter refer often to the Apaches, including the Aravaipa band of the Western Apache. South of the Gila River this band roamed over a wide swath of land that included the Empire, Cienega, and Sonoita valleys. The economy of the Western Apaches was based on nomadic, seasonal hunting and gathering and some plant cultivation. Because the Apache moved campsites often and did not establish permanent settlements, sites that they occupied tend to be ephemeral and difficult to find. No sites in the planning area have been recognized as being of Apache origin. But the probability is high that the Apache hunted, collected wild plant foods, and camped in the planning area and that sites representing these uses will eventually be found (Basso 1971; Bronitsky and Merritt 1986; Sheridan 1995).

#### **Spanish Colonial (ca. A.D. 1691 to 1821)/Mexican (ca. A.D. 1821 to 1854)**

Although mining and ranching potential attracted interest, hostilities with the Apaches discouraged both the Spaniards and Mexicans from establishing permanent settlements in the planning area. Several land grants existed nearby, but no historic records have been found to show that land in the planning area was part of any formal Spanish or Mexican land grants. We do not know whether Spanish or Mexican cattle grazed in the planning area.

Father Kino's narratives state that in 1699 he took 150 head of cattle to the Sobaipuri settlement at Los Reyes de Sonoitac, where the Jesuits had established a "visita," later known as San Ignacio de Sonoitac. Sometime after 1759 the Jesuits built a small church there. Records do not show that this venture developed into a successful cattle-raising operation. In 1825, Don Leon Herreras, a prosperous ranchero

living in Tubac, obtained the San Jose de Sonoita Land Grant which covered more than 8,000 acres around Kino's "visita." In 1832, Ignacio and Doña Eulalia Elias, citizens of Royon and Arispe, respectively, obtained the San Ignacio del Babocomari Land Grant which covered more than 34,000 acres south of the planning area. Both grants later went through a succession of ownerships (Bolton 1948; Di Peso 1953; Officer 1987; Sheridan 1995; Wagoner 1952; Wilson 1995).

### **Anglo-American (ca. A.D. 1854 to present)**

The first Anglo-Americans to take up land near the planning area began arriving after the Gadsden Purchase was ratified in 1854. Their numbers increased gradually after the National Homestead Act was passed in 1862 and the American Civil War ended in 1865. By the early 1870s, demand for beef by the military, mining settlements, and Indian reservations encouraged homesteading and the establishing of many small ranches in the Empire, Cienega, and Sonoita valleys. Droughts, rustling, and Apache raids caused many to fail. The Empire Ranch is among those that did survive and prosper well into the 20<sup>th</sup> century.

A 160-acre homestead owned by William Wakefield formed the nucleus of the Empire Ranch. Wakefield sold the land to Edward N. Fish and Simon Silverberg in June 1876. In August 1876, Fish and Silverberg sold the homestead to Walter L. Vail and Herbert S. Hislop. Both were in their mid-20s and had come to Arizona searching for land on which to establish a partnership cattle ranch. In October 1876, John N. Harvey joined the partnership, bringing capital for purchasing more land and livestock. Both Hislop and Harvey were from England and Vail's family had settled in Nova Scotia before emigrating to New Jersey.

Locally, the trio's ranch became known as the "English Boys' Outfit." Hislop sold his shares to Vail in 1878. Vail and Harvey continued to acquire neighboring land until the ranch extended some 60 miles from north to south and 30 miles east to west. In 1881, Harvey sold his shares to Vail who continued to develop and expand the business. Historic land records show that Vail bought out many homesteaders along Cienega Creek. When he died in 1906, the ranch covered almost 1 million acres.

In 1928, Frank S. Boice, Chairman of the Chiricahua Cattle Company, bought the Empire Ranch from the Vails. The Boices became well known in the Southwest for the purebred Hereford cattle they produced at the Empire Ranch. In 1969, the Boice family sold the ranch to Gulf American Corporation for a proposed real estate development which did not occur. Anamax Mining Company next bought the ranch lands for their mineral and water potential but did not develop these resources. A series of land exchanges in 1988 placed the land into public ownership under the BLM's administration as the Empire-Cienega Resource Conservation Area.

In November 1876, Hislop wrote a letter to his sister in London, England, stating that the small holding was called the Empire Ranch when he and Vail bought it and that an unfinished, four-room adobe house with an attached corral was included in the purchase (Fontana 1965). Exactly when this house was built has not yet been determined. Sawn lumber used as roof beams may have been cut at a nearby mill owned by Fish. Tree-ring dates from these beams may eventually provide an estimate as to when the house was built (Collins 1996; Dowell 1978; Fontana 1965; Pickrell 1961; Sheridan 1995; Soulli re-Harrison and Neidinger 1995; Stein 1990; Wagoner 1952; Wilson 1995; Zook 1994).

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As his family and staff grew, Vail enlarged the house. By the late 1890s, it contained at least 20 rooms and covered about 9,000 square feet of living space. Remodeling projects between 1900 and the late 1950s included the following:

- Adding gabled roofs, wooden shingles, and rolled roofing.
- Applying cement stucco to both interior and exterior walls.
- Installing electrical wiring and plumbing, propane and natural gas heating, sheet rock ceilings, carpeting, wood paneling, a large picture window, and wood and cement floors.

Today, the house exhibits architectural features and home furnishing styles popular in rural Arizona between the territorial settlement period and post World War II. The Empire Ranch House is listed on the National Register of Historic Places.

Between 1876 and the mid-1890s, a cluster of buildings was placed around the ranch house forming the ranch headquarters. Other structures were built in the 1940s and 1950s. These buildings include: three houses, an adobe barn, a tack shed, a horse barn, a grain shed, a machine shop, and a manger and stalls. A small swimming pool was built in 1939 or 1940. These buildings are eligible for listing on the National Register of Historic Places, possibly as a rural landscape. A brick house built north of the ranch in the 1960s would probably not meet the criteria for listing on the National Register. But this house would figure importantly in maintaining the integrity of the landscape and adaptive reuse (Soullière-Harrison and Neidinger 1995; Stewart 1970; Zook 1994).

The planning area has been used in historic times mainly for ranching and farming. A variety of livestock ranching structures and sites

are dispersed around the area. This inventory includes: corrals, several cabins, short-term camps, windmills, and watering tanks. Letters written by Walter Vail state that each year he hired Mormon farmers from Benson to cut hay at fields near Cienega Creek. Vail fed the hay to his horses and other livestock kept at the ranch headquarters. The farmers camped near the hay fields. Evidence of these camps may still exist (Dowell 1978).

### **Mining History**

From 1880 to 1885, Walter Vail and partners profitably operated the Total Wreck Mine at the northern end of the planning area. At its peak, this mine yielded more than 50 tons of **silver** ore per day. Equipped with twenty 950-pound stamps and 14 amalgamation pans, the Total Wreck mill could process from 65 to 70 tons of ore per day.

Today, the mine is privately owned but not operating. The remnants of Total Wreck City, a settlement of about 300 people that grew up around the mine, are on adjacent Arizona State Trust Land. The settlement included more than 50 houses, three hotels, a brewery, four saloons, and several Chinese laundries. Walter Vail's brother Edward operated a butcher shop supplied with beef raised on the Empire Ranch. Remnants of a system used to pump water from Cienega Creek to the mine lie within the planning area (Dowell 1978).

### **Railroad History**

A 4.5-mile segment of the historic Atchison, Topeka, and Santa Fe Railroad line crossed the northern end of the planning area. Construction of the Santa Fe Railroad through southern Arizona in the early 1880s provided a means to haul supplies and freight into the region and beef and ore out to distant markets. The railroad was a primary contributor to the development

and success of ranching and mining in the Empire, Cienega, and Sonoita valleys. The railroad hauled thousands of cattle raised on the Empire Ranch to pastures and markets in California and Kansas. The railroad also shipped silver ore from the Total Wreck Mine to New York (Dowell 1978; Sheridan 1995).

### **Military History**

Between 1856 and the mid-1880s, U.S. Army cavalry troops regularly patrolled the Empire and Sonoita valleys. Many skirmishes with Apaches in the general vicinity of the planning area are documented. According to Hislop's and Vail's letters, cavalry troops sometimes camped near the Empire Ranch headquarters, and both men visited with the officers. Among the first army troopers who patrolled the area were those stationed at Fort Buchanan, which was built at the headwaters of Sonoita Creek in 1856 (Dowell 1978; Fontana 1965; Sheridan 1995).

### **NATIVE AMERICAN LOCATIONS OF TRADITIONAL CULTURAL AND RELIGIOUS IMPORTANCE**

To date, no Native Americans have named any locations of traditional cultural or religious importance in the planning area. The Tohono O'odham claim ancestral affiliation with the Hohokam and Sobaipuri Indians who inhabited the planning area and surrounding land. The Hopi Indians also claim affiliation with the Hohokam and Sobaipuri. The Hopi include most of Arizona in their oral tradition about ancestral migration routes. San Carlos Apache elders have expressed interest in the planning area, but have not yet named any specific resources or locations.

Both the Tohono O'odham and the San Carlos

Apaches have expressed an interest in being allowed access to wild plants used for traditional medicinal, ritual, and utilitarian purposes.

The remains of prehistoric Native Americans have been found in the planning area and more will probably be found. When such remains are found, BLM contacts representatives of appropriate Native American groups and arranges for treatment or repatriation according to criteria specified by the Native American Graves Protection and Repatriation Act and the Archaeological Resources Protection Act.

## **LAND USES**

### **LANDS AND REALTY ACTIONS**

#### **Rights-of-Way**

The Empire-Cienega Planning Area has about 40 recorded easements and rights-of-way for roads, utilities, and other land uses. BLM acquired and reserved these easements and rights-of-way with its acquisition of the Empire-Cienega property on June 8, 1988. More recent roads and utility lines have been developed to service structures and facilities but are not recognized as rights-of-way because they benefit BLM and its lessees.

#### **Major Utility Lines**

Electrical transmission and communication rights-of-ways cross public lands in the following areas:

T.18 S., R. 17 E., Sec. 12; Tucson Electric Power Co.

T.18 S., R.18 S., Sec. 7 and 19; Arizona Electric Power Co.

### Chapter 3. Affected Environment: Land Uses

T. 19 S., R. 18 S., Sec. 5 and 9; Tucson Electric & Arizona Electric

The right-of-way widths for these easements are about 100 feet each. Neither electric company has any immediate plans or proposals to install new or more electrical lines.

A privately owned El Paso gas line easement runs through federal lands in the following areas:

T. 19 S., R. 17 E., Sec. 7, 18, 19, 30

T. 19 S., R. 16 E., Sec. 25

Owned by the El Paso Natural Gas Company and conveyed to El Paso before BLM acquired the Empire-Cienega property, this private easement is 60 feet wide. El Paso Natural Gas has no plans to install any other new lines within its private easement. Should a new gas line be needed in the future, El Paso will have to cross BLM lands next to its easement to install, maintain, and access the new line.

No other major utility lines run through any federal lands at the north end of Empirita or near Interstate 10. But throughout the planning area are scattered smaller utility lines that BLM and prior owners installed and granted.

#### Land Use Permits

In the past, BLM has authorized land use permits in the planning area for uses such as major motion pictures, television commercials and productions, bee hives, and still photography. BLM rarely issues these authorizations, at most, issuing one permit every two years.

#### Land Tenure

The Land Tenure Amendment to the Safford District Resource Management Plan (RMP)

(BLM 1994b) made land tenure decisions for the Empire-Cienega Planning Area while the planning area was administered by the BLM Safford District. The Empire-Cienega Long Term Management Area (LTMA) was one of 24 LTMA's delineated in the Land Tenure Plan Amendment. These LTMA's are analogous to the resource conservation areas (RCAs) established in the Phoenix RMP. The boundaries of the Empire-Cienega LTMA correspond to the current planning area boundary. Management prescriptions for the LTMA's include the following:

- Intensively manage the public lands for their multiple resource values as defined in the Federal Land Policy and Management Act.
- Retain all public land (surface and subsurface estate) and possibly seek to acquire State Trust and private lands within these areas.
- Consider land acquisitions on a case-by-case basis and consider economic as well as natural resource impacts.

Under these prescriptions, BLM may acquire land by exchange or purchase by considering four alternatives for private lands acquisitions:

- Land owner education.
- Entering into cooperative management agreements.
- Partial acquisition such as conservation easements.
- Full "fee simple title" acquisition.

The purpose of the acquisition program is to acquire lands that can improve the area's resource management and values and enhance the benefits of public use and services. Ongoing land exchanges that would acquire more public lands within the planning area include the

Morenci Land Exchange EIS (ROD, March 1997) and the Dos Pobres/San Juan Project EIS (Volume 2, Appendix BB-B9).

## PRIME AND UNIQUE FARM LANDS

Public Law 97-098, the Farmland Protection Policy Act of 1981, authorizes the designating of prime and unique farm lands. BLM has not designated prime or unique farm lands in the planning area. Before BLM acquired the property, land on the Cienega Ranch along Cienega Creek **was farmed historically. The Vail family established the farm on the Cienega Ranch around 1900. When the Chiricahua Cattle company acquired the ranch, the farm was leased out and operated until about 1950. The fields were abandoned when Jack Greenway held the property, but were farmed again by Sam Bell in the 1970's. Anamax Mining Company also** briefly farmed to maintain agricultural water rights. These agricultural fields have been abandoned (**Gerald Korte, Letter to BLM received November 26, 2001**).

## FLOODPLAIN DESIGNATION

Lands within the planning area might meet the criteria for Pima and Santa Cruz County floodplain and flood prone designations for lands, but these areas have not been delineated. BLM generally avoids floodplains as locations for structures and recreation facilities. Some range improvements, including fences and livestock watering facilities, have been built on floodplains and require regular maintenance.

## MINERALISING

### Mineral Potential

#### *Fluid Minerals*

The Empire-Cienega Planning Area is ranked prospectively valuable for oil and gas (Stipp and Dockter 1987). Most of the planning area is underlain by a thick and structurally complex sequence of Mesozoic and Paleozoic sedimentary rocks overlain by Tertiary valley-fill alluvium. The Cretaceous Bisbee Group immediately underlies the Tertiary alluvium and contains black shale which may have hydrocarbon source rock potential. An oil seep is reported to have occurred in T. 18 S., R. 18 E., SW<sup>1</sup>/<sub>4</sub> section 15 within the Bisbee Group where it crops out along the eastern margin of the Cienega Basin (Gill 1979). Oil and gas shows have been reported in exploratory wells drilled on the edge of the basin.

The Ted Jones No. 1 Juanita State drilled in section 34, T. 18 S., R 18 E. found several gas shows in shale in Bisbee Group strata. Source rock analysis conducted by the Amoco Production Company concluded that samples from this well have high enough organic carbon content to make a good source rock for gas (Arizona Geological Survey file data.) The Jones et al. Larimore No. 1, drilled near Sonoita (Section 9, T. 20 S., R. 16E.), found oil and gas shows in Cretaceous rocks at a depth of 3,216 feet (Arizona Geological Survey file data). These lines of evidence suggest that the Cienega Basin is a favorable environment for oil and gas.

The planning area is not prospectively valuable for geothermal resources (Witcher et al. 1982.)

#### *Solid Leasable Minerals*

Solid leasable minerals (coal, oil shale, tar sands, potash, phosphate, sodium) are not present or potentially present within the

### *Chapter 3: Land Uses*

planning area, and there is no record or expression of interest in this resource.

#### ***Locatable Minerals***

The Empire mining district lies within the Empire Mountains and consists of carbonate replacement deposits and veins associated with Laramide porphyry dikes. Mineralization is spotty and the deposits are small tonnage and high grade, with rich silver ore having been mined near the surface (Keith 1974). Production was from the enriched oxidized portion of the deposits, which are most probably mined out now. Some of the deposits may extend down to the water table and contain zones of sulfide mineralization. Exploration has not been conducted deep enough to test this hypothesis.

Minerals were discovered in the 1870s, and ~~considerable silver~~ **and a considerable amount of silver** was mined in the 1880s and 1890s. Base metals were produced from 1907 to 1964. Total production from the district was 34,500 tons of ore containing lead, zinc, copper, silver, gold, molybdenum, and tungsten. The major producing mine of the district was the Total Wreck Mine which produced 14,000 tons of ore averaging 8% lead, 7 oz./ton silver, and minor copper and gold. The chief ore minerals were cerussite, wulfenite, and cerargyrite.

From the above information, the Empire Mountains appear to have low potential for significant metallic mineral resources. Deposits may be hidden inside the mountains, but these are most likely to be sub-economic.

High-purity limestone deposits are known to occur in the Paleozoic carbonate strata. The Escabrosa Limestone is particularly favorable for high-purity limestone deposits. This formation crops out sporadically in the Empire Mountains in small fault blocks. Limestone has been quarried from State Trust Land on the

north side of the Empire Mountains just outside the planning area. Limestone placer claims owned by the Georgia Marble Company occur in section 7, T. 18 S., R 17 E. These claims encompass a subeconomic deposit consisting of a relatively thin bed of marbleized Escabrosa Limestone (Acker 1998). Nevertheless, the Empire Mountains have high potential for high-purity limestone.

Directly west of the planning area is the Greaterville gold placer district. Placer gold was mined from Quaternary gravels in the bottoms of major canyons that dissect the valley-fill alluvium on the east side of the Santa Rita Mountains. The gold-bearing gravels begin near the heads of the east-trending canyons and extend 1.5 to 5 miles downstream but do not appear to extend into the planning area (Cox 1994). The potential for placer gold occurring within the planning area is low.

The most significant metallic mineral resource in southern Arizona is copper. Porphyry copper deposits occur in the Helvetia-Rosemont district in the northern Santa Rita Mountains directly west of the Empire Mountains and in the southern end of the Whetstone Mountains east of the planning area. These deposits form in hydrothermal systems related to emplacement of plutons of granitic porphyry rock. The mineral potential of the Cienega basin remains largely unknown because of the thick covering of alluvium. From a regional standpoint, the basin must be considered as having moderate potential for copper because of the favorable geologic environment and presence of nearby deposits.

#### ***Salable Minerals***

Sand and gravel and landscape rock are the two major salable mineral commodities that are sold within the Tucson and Sierra Vista market areas. Economic deposits of this type have not been found within the planning area. But the potential for sand and gravel deposits is high

within the drainages and the alluvial valley-fill. No interest in mining sand and gravel has been demonstrated since the planning area became public land although several Arizona Department of Transportation aggregate sources lie along Highways 83 and 82. Distance to major market areas could prohibit developing a mineral material site.

### **Mineral Rights**

Except for an area in the Empire Mountains and several split-estate parcels, the Empire-Cienega Planning Area is closed to mineral entry and mineral leasing pending a formal opening order (Map 3-7). Lands open to mineral entry total about 460 acres in sections 7, 8, 17, and 18 of T. 18 S., R. 17 E and about ~~5,915~~ **7,167** acres of split-estate. These parcels are original public domain lands. The legal descriptions of the split-estate parcels with either state or private surface and federal minerals are in Appendix 3, Split-Estate Parcels. As of May 19, 1998, there were three placer claims in section 7. BLM has issued no mineral leases within the planning area.

BLM manages locatable minerals under the 43 CFR 3809 Surface Management Regulations, oil and gas under the 43 CFR 3100 regulations, and mineral materials under the 43 CFR 3600 regulations. The planning area is closed to mineral material disposal pending resource management plan determinations.

### **HAZARDOUS MATERIALS**

No recognized environmental conditions are known to exist within the planning area. A *recognized environmental condition* is defined as the presence or likely presence of any hazardous substance or petroleum product on the property under conditions that indicate an

existing release, a past release, or a material threat of a release into the ground, groundwater, or surface water. An abandoned 1,000-gallon underground fuel storage tank was removed from the Empire Ranch in 1994 to avoid possible contamination.

### **RANCHING AND LIVESTOCK GRAZING**

As a result of the 1988 land exchange that brought the Empire-Cienega lands into public ownership, BLM acquired private lands in portions of five ranches with ongoing livestock operations: the Empire Ranch, the Cienega Ranch, the Rose Tree Ranch, the Empirita Ranch, and the Vera Earl Ranch. In addition to these private lands, BLM also acquired the Arizona State Land Department grazing leases for the Empire, Cienega, and Empirita Ranches. After BLM's acquisition of the private lands, the Empire and Cienega Ranches were combined into one grazing allotment, the Empire-Cienega. The acquired public lands in these four allotments were not covered under an existing land use plan and, therefore, grazing management allocations and prescriptions are being developed for them in this plan (Map 3-8). The Rain Valley allotment is also within the planning area boundary. The Rain Valley allotment includes 160 acres of public domain lands but is mostly private and State Trust Land.

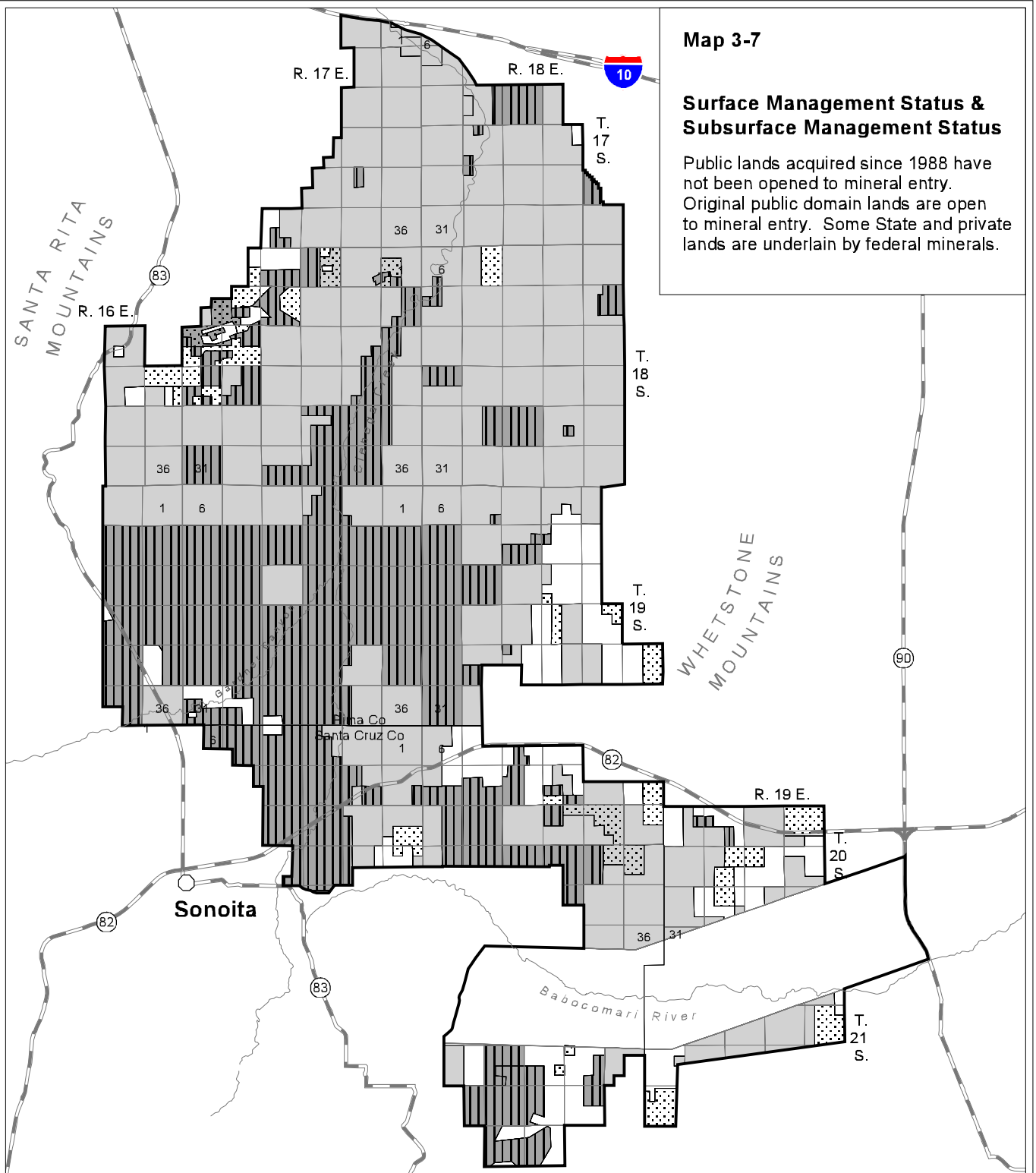
The Rain Valley allotment is covered under the Safford District Resource Management Plan (BLM 1991) and grazing impacts for the allotment were analyzed in the Eastern Arizona Grazing EIS (BLM 1986). Therefore, management prescriptions for this allotment are not included in this plan. In 1988, BLM also acquired, in the Empire Mountains, 2,000 acres of private lands that did not have valid existing grazing leases at the time of transfer. Since



Map 3-7

**Surface Management Status & Subsurface Management Status**

Public lands acquired since 1988 have not been opened to mineral entry. Original public domain lands are open to mineral entry. Some State and private lands are underlain by federal minerals.



**FINAL  
LAS CIENEGAS  
RESOURCE MANAGEMENT PLAN**



United States Department of the Interior  
BUREAU OF LAND MANAGEMENT  
TUCSON FIELD OFFICE



**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- ▨ Federal Minerals, Not Open to Entry
- ▤ Federal Minerals, Open to Entry
- Non-Federal Minerals

acquiring these lands, BLM has been approached by people wanting to establish a new grazing allotment in the Empire Mountains. The proposed allotment includes acquired lands, original public domain lands, and private lands. Most livestock operations in the Sonoita area are year-long operations, raising calves from a base herd of cattle for marketing. The ranches usually consist of a mixed ownership of private, State Trust, national forest, and BLM-administered lands. Although the operations are year long, they may only seasonally use the federal rangelands.

Table 3-20 summarizes the acreages and permitted grazing use on the four allotments with acquired public lands. The Empire-Cienega and the Empirita allotments consist entirely of federal and state-leased lands. (The operators own no deeded lands in these allotments.) The operators in the Vera Earl and Rose Tree allotments own private lands in their allotments and use these private lands in common with the leased grazing lands. On the four allotments BLM permits a total grazing use of 9,984 animal unit months (AUMs) of forage, which equates to 832 cattle on a yearlong basis (CYLs).

Only the Empire-Cienega and Empirita allotments have grazing management plans. BLM and NRCS completed an ecological site inventory for the Empire-Cienega allotment in 1995 and BLM and the livestock operators developed an interim grazing plan in 1995 (BLM 1995) (See also Appendix 2, Summary of Empire-Cienega Interim Grazing Plan). The Parsons Company Inc., the Natural Resources Conservation Service, the Arizona State Land Department, and BLM cooperatively developed a grazing management plan for the Empirita Ranch in 1994 (NRCS 1994) and completed an ecological site inventory of the rangelands (See Appendix 3, Ecological Site Inventories). Both of these plans did the following:

- Prescribed how the livestock grazing operation would be conducted to sustain the resources.
- Established permanent vegetation monitoring.
- Determined needed range improvements.

BLM completed a biological evaluation of the Empire-Cienega interim grazing plan, consulted with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act, and received a biological opinion from USFWS (No. 2-21-95-F-177). BLM is now implementing the actions in the biological opinion (See Appendix 2, Summary of Biological Opinions). Before this consultation, BLM had consulted with USFWS (1990) on the first riparian fences built along Cienega Creek and received a biological opinion (No. 2-21-90-I-150). USFWS also issued another biological opinion (No. 2-21-96-F-160) as a result of the Section 7 consultation on the livestock grazing program administered by BLM's Tucson Field Office under the Safford District Resource Management Plan. This RMP consultation covered the four allotments with acquired lands as well as the Rain Valley allotment (See Appendix 2, Summary of Biological Opinions).

## **OUTDOOR RECREATION**

Southern Arizona is heavily marketed by the tourism industry, especially for recreation involving open space, natural areas, and old west themes. The proximity of the planning area to Tucson and smaller surrounding communities attracts many visitors traveling among several southeast Arizona tourist attractions.

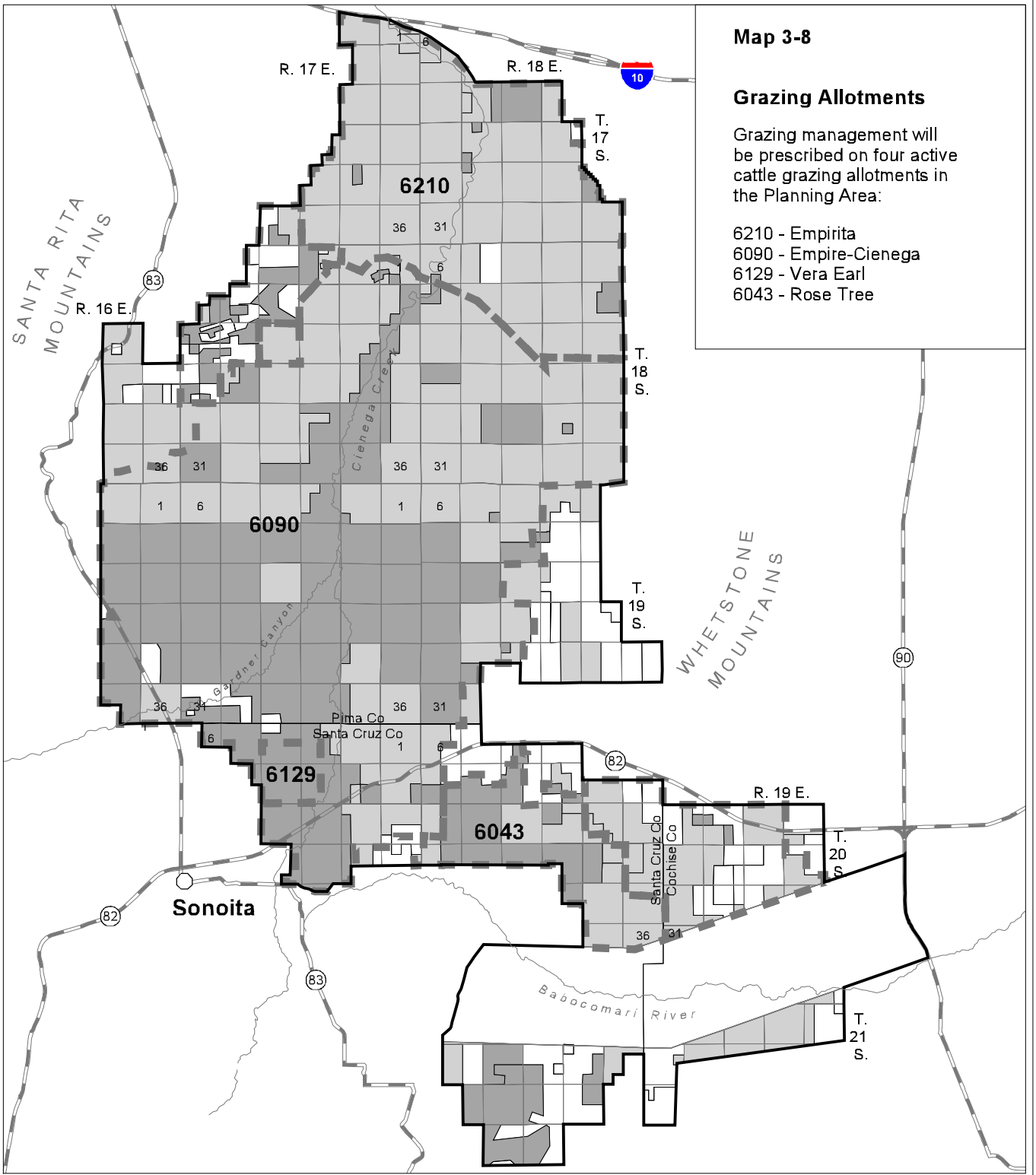
The planning area provides a setting for a wide variety of recreation, mostly for dispersed activities. But the historic ranch is a focal point

**Map 3-8**

**Grazing Allotments**

Grazing management will be prescribed on four active cattle grazing allotments in the Planning Area:

- 6210 - Empirita
- 6090 - Empire-Cienega
- 6129 - Vera Earl
- 6043 - Rose Tree



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**LEGEND**

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Allotment Boundary and Number

**Table 3-20  
Grazing Allotments, Empire-Cienega Integrated Management Plan**

Allotment	Total Acres	Total Acres Grazed	Total Cows	BLM Acres Grazed <sup>1</sup>	BLM Cows	ASLD <sup>3</sup> Acres	ASLD Cows	Private Acres	Private Cows
Empire-Cienega (6090)	74,146	73,696	1,500	36,025 (659 Not Grazed) <sup>2</sup>	704	37,462	796	0	0
Empirita (6210)	24,988	23,908	337	440 (1,080 Not Allocated)	9	23,468	328	0	0
Rose Tree (6043)	8,869	8,869	200	3,950	92	3,719	24	1,200	84
Vera Earl (6129)	1,440	1,440	27	1,440	27	0	0	N/A	N/A
<b>TOTAL:</b>	<b>109,443</b>	<b>107,913</b>	<b>2,064</b>	<b>41,855</b>	<b>832</b>	<b>64,649</b>	<b>1,148</b>	<b>1,200</b>	<b>84</b>

<sup>1</sup> An additional 160 acres of public land are grazed on the Rain Valley allotment.

<sup>2</sup> The planning area has 7,360 acres of ungrazed public lands, 659 acres of which are within livestock enclosures on the Empire-Cienega allotment and 1,080 acres of which are not allocated to grazing within the Empirita allotment. In addition, 2,480 acres of acquired and original public domain land in the Empire Mountains are not allocated to grazing, and 3,141 acres of public land in the Appleton-Whittell ACEC are closed to grazing.

<sup>3</sup> Arizona State Land Department.

for many visitors. Activities vary from driving off-highway vehicles to camping, bird watching, studying nature and history, hang gliding, picnicking, horseback riding, hunting, and training bird dogs. Not all of these activities require developed facilities, but visitors often use the grazing permittee’s improvements such as corrals and water sources.

Areas of concentrated use include Oak Tree Canyon, the old Agricultural Fields near the Cienega Ranch, the Maternity Well Site, and the old Air Strip. Although the planning area offers high-quality experiences for most recreation activities, the quality of experiences and resources can be diminished by high numbers of visitors during hunting seasons and by those who do not use minimum impact camping techniques.

Generally, visitors drive on existing roads and camp in dispersed areas. Brochures and entrance signs encourage visitors to camp at

existing primitive campsites and not to create new campsites or roads. But visitors create many illegal wildcat roads and primitive campsites every year. Most visitors camp or park in undeveloped or nondesignated areas at sites developed by social camping (where campers use a site because they see evidence of prior camping). Many of these campsites have degraded surrounding areas. The total disturbed surface in the planning area from campsites is estimated to be 10 acres. An estimated 100-150 social campsites and fire rings dot the planning area.

Oak Tree Canyon seems especially affected because of its desired attributes such as its many Emory oaks, its cooler climate, and its easy access by two-wheel drive vehicle. Visitors often establish their campsites and fire rings directly under the oaks. As a result, extreme campfire heat reaches into the branches and vehicles compact the soil so that little rain water can seep to the roots.

Chapter 3: Land Uses

The planning area's two developed campsites have fire grills, tables, or both. One site is at Empire Gulch, one mile north of headquarters. This site may have been intended for picnicking or day use, but visitors often use it for camping and human waste is contaminating the gulch. The other site is under some old cottonwood trees just southeast of the Agricultural Fields, accessed near North Canyon. Because branches from these decadent trees weigh several hundreds to thousands of pounds and can easily drop off, they are a hazard to anyone camping beneath them.

Unofficially, one can obtain non-potable water at areas such as the Empire Ranch headquarters, Maternity Well, the well between Empire Gulch and the abandoned airstrip, and stock tanks. Often the public will ask the grazing permittee for permission to use these wells and tanks. BLM asks special recreation permit holders to haul in their own drinking water from outside the planning area.

**Table 3-21  
Recreation Visitors to the Empire-Cienega Planning Area, 1993-1998**

Activity	% of Visitor Days Engaged in Activity by Season				
	Winter	Spring	Summer	Fall	Overall
Backcountry Touring and Sightseeing	34.9	38.8	19.7	32.9	32.5
Picnicking	8.7	9.0	17.7	5.0	9.8
Camping Near Vehicle	3.0	9.8	3.4	11.9	7.7
Camping Away from Vehicle	5.0	0.3	0.1	0.2	1.1
4-Wheel/All-Terrain Vehicles	2.7	2.1	2.8	3.2	2.7
Motorcycling	0.7	1.1	1.8	1.1	1.2
Bicycling	3.2	2.4	1.3	3.9	2.7
Hunting	2.9	2.1	10.1	11.7	6.5
Watching Wildlife	13.5	14.9	11.1	12.8	13.2
Hiking	2.9	3.0	5.4	1.5	3.1
Viewing Cultural Sites	0.7	--	1.1	0.3	0.4
Field Dog Activities	1.5	0.8	1.1	0.7	0.9
Other	20.3	15.7	24.4	14.8	18.2
<b>TOTAL:</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>TOTAL VISITOR DAYS:</b>	<b>1,203</b>	<b>2,256</b>	<b>1,461</b>	<b>1,707</b>	<b>6,627</b>

Throughout the planning area are popular hunting campsites which remain in traditional use. Most hunters seek deer, javelina, coyote, and small game such as rabbit and quail. The Arizona Game and Fish Department issues a few pronghorn hunting permits each year.

The planning area has become increasingly popular for commercial recreation and organized events that require special recreation permits. In the past 10 years, BLM has issued permits for hiking, bicycling, equestrian outfitters, orienteering, and competitive bird dog events. Other activities that are known to be occurring but for which BLM has not issued special recreation permits include bird watching tours, stargazing, hang gliding, para-gliding, ultra light flying, paint-ball battles, and family reunions. Most of these activities are based at three sites: Maternity Well (50%), the abandoned Agricultural Fields (30%), and the pronghorn release site (10%). The remaining 10% of use occurs at other sites.

Table 3-21 presents the percentages of visitors engaged in a variety of recreation activities in the planning area between 1993 and 1998. These percentages are calculated from sign-in register sheets collected at the entrance off Highway 82 and at the kiosk on the main road one mile east of Highway 83. Because not every visitor signs in, these numbers do not represent a concise or accurate account of recreation use but rather a sampling. The activities in the "Other" category in Table 3-21 include hang gliding, para-gliding, and horseback riding.

## **PUBLIC EDUCATION AND INTERPRETATION**

General information on the planning area may be obtained from BLM. Some information is also presented in cooperatively funded maps and brochures. Supplies of brochures at visitor centers vary throughout the year. The current trend is to scan all brochures and maps onto

computers, allowing information printed from computer web sites to replace traditional printed material. The public is increasingly accessing these sites. The public may also obtain off-highway vehicle maps and general guides by mail or pick up copies at the BLM office. Brochures or maps are occasionally available at the historic Vail ranch house or given out by volunteers. The main information source for most planning area visitors consists of displays on bulletin boards at the main entrances from Highways 83 and 82.

The public generates significant amounts of information on the planning area through internet sites, guide books, and other publications. We do not know the exact amount, accuracy, or contents and whether this information supports management objectives.

BLM presents informal and formal interpretive/educational programs 1 to 10 times a year for schools, universities, and professional and other groups. But BLM receives an average of up to 20 requests a year for formal presentations by resource specialists. Often the requesting parties are professional organizations conducting seminars, field trips, or large conferences. Many informal requests for presentations do not give much notice and BLM specialists may deliver formal or informal presentations depending on the time they have for preparation.

One way that BLM is dealing with increasing requests for tours by experts is referring them to the outfitters with permits to operate in the planning area. But outfitters often ask BLM staff to participate because they do not feel qualified to talk to the public about the area.

## **ACCESS AND OFF-HIGHWAY VEHICLE MANAGEMENT**

The planning area's most used and publicized access point is the Empire Ranch Road, off of Highway 83 near mile marker 40. The second

### *Chapter 3: Special Designation Areas*

most used access is South Road from Highway 82, four miles east of Sonoita. In addition, the ~~U.S. Forest Service has developed an off-highway vehicle (OHV) staging area~~ at Highway 83 and Oak Tree Canyon. ~~This staging area~~ allows access between Forest Service, State Trust Land, and BLM-managed areas for hikers, horseback riders, all-terrain vehicles, and motorcycles only. The culvert and barricades under the highway exclude cars and trucks. This access is published in OHV maps and guides distributed by Arizona State Parks.

The public uses many other access points to enter public lands in the planning area. These access points appear on a wide range of maps. BLM has not secured legal access for any of the other access points that cross private or State Trust Lands. These access points, therefore, may not be open to the public over the long term.

Under interim management guidance for the public lands in the planning area, motorized vehicles are limited to designated roads and trails (BLM 1988). Although most existing roads have remained open to public use, some roads have been closed or restricted for resource or safety reasons. The designated road system was partially implemented in 1999 through publication of the Empire-Cienega Access Guide map and implementation of an associated road numbering system.

## **SPECIAL DESIGNATION AREAS**

### **WILD AND SCENIC RIVERS**

BLM has determined that two segments of Cienega Creek within the planning area are eligible for further study in the Wild and Scenic River evaluation process because Cienega Creek is free flowing and has outstandingly remarkable essential habitat for the federally endangered Gila topminnow (Safford District Resource

Management Plan Amendment) (BLM 1993). The Final Arizona Statewide Wild and Scenic Rivers Study Report/Record of Decision (February 1997) determined that the two segments of Cienega Creek were suitable to be recommended to Congress for inclusion in the National Wild and Scenic Rivers System. Both river segments have been tentatively classified as scenic.

The Cienega Creek Wild and Scenic River Study Area contains 10.5 river miles of which 10 are managed by BLM and 0.5 miles crosses State Trust Land (Map 3-9). The study area extends out 0.25 miles from the mean annual high water mark shoreline on either side of Cienega Creek. The 3,360-acre study area includes 3,200 acres of BLM-administered land and 160 acres of State Trust Land. The 10.5 miles of river in the study area include two separated segments of Cienega Creek totaling 8.5 miles and 1-mile segments each of Mattie Canyon and Empire Gulch—tributaries to Cienega Creek.

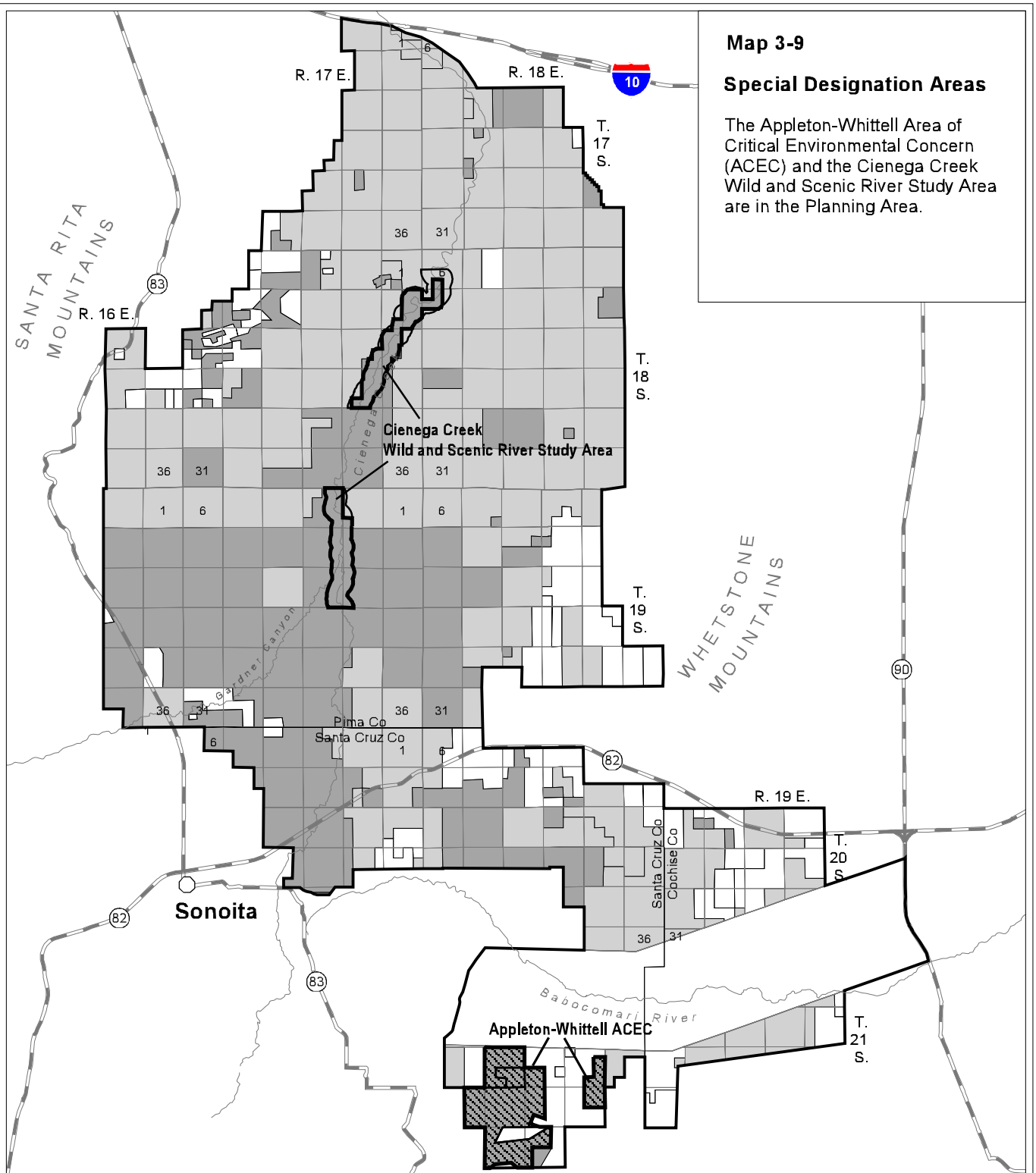
### **AREAS OF CRITICAL ENVIRONMENTAL CONCERN**

BLM has designated one area of critical environmental concern (ACEC) within the planning area. The Appleton-Whittell ACEC includes 3,141 acres of public land. It is managed under a cooperative management agreement with the National Audubon Society (signed in 1986) as part of the Appleton-Whittell Biological Research Sanctuary (Research Ranch) (Map 3-9). The objectives for the area include the continuation of ongoing research, encouragement of future research, and protection of the land and its ecological communities from disturbance. The ACEC provides a unique outdoor laboratory for studying the effects of nongrazing on a desert grassland and ecological relationships within a

### Map 3-9

### Special Designation Areas

The Appleton-Whittell Area of Critical Environmental Concern (ACEC) and the Cienega Creek Wild and Scenic River Study Area are in the Planning Area.



## FINAL LAS CIENEGAS RESOURCE MANAGEMENT PLAN



United States Department of the Interior  
BUREAU OF LAND MANAGEMENT  
TUCSON FIELD OFFICE



### LEGEND

- Planning Area Boundary
- BLM Land
- State Land
- Private Land
- Wild & Scenic River Study Area
- Existing ACEC

April 2002



nongrazed grassland. Within the ACEC, BLM has done the following:

- Limited motorized vehicles to designated roads and trails.
- Prohibited land use actions except as authorized by the Research Ranch.
- Kept the area closed to mineral location, leasing, and sales.

## **SOCIAL AND ECONOMIC CONCERNS**

The Empire-Cienega Planning Area is surrounded by three counties and several communities. Social and economic issues brought forth during scoping include the following:

- How do our actions reflect on economics of the region, both private and public?
- Growth
- Attitudes (i.e., expectations, balance, respect, communication, rural versus urban, education).

The planning area itself is large. Although its lands are in Pima and Santa Cruz counties, its management may affect communities in other counties.

## **QUALITY/WAY OF LIFE**

Residents of Sonoita have expressed a desire to maintain their quality of life--their current rural lifestyle. But the quality-of-life issue is highly subjective. Quality-of-life issues involved the following growth concerns:

- Impacts of future traffic between Sonoita and Tucson.
- Possible increase in commuters and the concern that growth would bring internal and external impacts upon public/forest/private lands.
- How these impacts would affect the area's rural lifestyle.

## **POPULATION AND DEMOGRAPHICS**

Communities near the planning area are in three counties: Vail in Pima County, Patagonia and Elgin in Santa Cruz County, and Benson in Cochise County. These communities range from 8 to 20 miles from the planning area. The closest communities are Sonoita, Elgin, Patagonia, and Vail. The largest nearby community is Benson. These communities vary in population from 417 in Elgin to more than 6,000 in Benson. While Benson's population is 61% urban, the other communities are mostly rural (Bureau of the Census 1996).

Projections for the year 2000 estimate a 10.7% population increase for Cochise County. Santa Cruz County is projected to increase by 16.2%, and Pima County will have the largest increase in population--18% (ADES 1998).

As a percentage of the communities' county population, Hispanics comprise the single largest ethnic minority group. The largest populations are in Vail with 26.9% and Patagonia with 35.8%. Native Americans and other minority groups make up less than 5% of the population. in all of the communities (Bureau of the Census 1996).

Out of the 15 counties in Arizona, Santa Cruz is ranked fifth in the state in the number of people in poverty. Cochise is ranked eighth and Pima eleventh (Bureau of Census 1993a).

## **LOCAL AND REGIONAL ECONOMY**

The main economic activities in Santa Cruz County are concentrated in Nogales, 18 miles south of Patagonia (Arizona Department of Commerce 1993). All of Santa Cruz County is an Enterprise Zone. An Enterprise Zone is a Presidential Empowerment Initiative that seeks to empower communities by supporting local plans that coordinate economic, physical, environmental, community, and human development. The county's main industries include tourism, international trade, manufacturing, and services. Patagonia is the second largest community in Santa Cruz County, but its population is only 1,664 whereas Nogales has nearly 8,000 residents.

Pima County is the second largest Arizona county in population and area. Major county industries include copper mining, manufacturing, tourism, and education. Vail is predominately rural. Its residents are either self-employed or employed by local, state, or federal governments (Arizona Department of Commerce 1994).

Farming, ranching, tourism, and the military are the major industries in Cochise County. Sierra Vista is the county's largest city. Benson, the second largest city, lies along several trade routes: Interstate Highway 10, U.S. Highway 90, and the main line of the Southern Pacific Railroad. Nearby mining and manufacturing are the area's major employers.

## **EMPLOYMENT**

The statewide unemployment rate in Arizona is 4.7%. Countywide unemployment varies greatly. Pima County has the lowest unemployment rate at 3.4%. Santa Cruz County has the highest unemployment rate at 17.9%. Twenty-two percent of the county's unemployment is in the Nogales area. The unemployment rate in Cochise County is 10.0%. The unemployment rates for both Santa Cruz and Cochise counties exceed the statewide unemployment rate (ADES 1998).

## **ENVIRONMENTAL JUSTICE**

On February 11, 1994, Executive Order 12898 (Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations) was published in the *Federal Register* (59 FR 7629). The order requires federal agencies to recognize and address disproportionately high and adverse human health or environmental effects to its program's policies and activities on minority and low-income populations. The Environmental Protection Agency has defined environmental justice as the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

BLM has involved the public by inviting it to participate in local scoping meetings at the beginning of the EIS process. Other public meetings of the Sonoita Valley Planning Partnership have invited the public to sit in and contribute their issues and concerns about the planning area as well as actively participate in developing the management plan (See Chapter 5).

## CHAPTER 4

# ENVIRONMENTAL CONSEQUENCES



The Gray Hawk, one of more than 230 bird species on the National Conservation Area, nests in large cottonwood trees.

# CHAPTER 4

## ENVIRONMENTAL CONSEQUENCES

### INTRODUCTION

Chapter 4 presents the environmental consequences of the alternatives described in Chapter 2. (Table 2-32 presented a comparative summary of these consequences.) All environmental consequences from the alternatives are described for each resource topic. Resource topics are presented in the same order as in Chapter 3, Affected Environment. Alternative 1 (Current Management) is the environmental baseline. Under each resource topic, Chapter 4 first discusses the consequences of no change in current management (Alternative 1) and then describes changes in impacts under Alternatives 2, 3, and 4. Cumulative impacts are addressed at the end of each resource section. The following assumptions are common to all impact analyses:

- BLM would have the funding and work force to implement the selected alternative. (But the alternatives might vary in the funding and staffing needed for implementation.)
- Short-term impacts would occur over a period of 5 years or less.
- Long-term impacts would occur over a period exceeding 5 years.
- Short- and long-term impacts are described for proposed decisions and actions on public lands under each alternative. The exception is for impacts of livestock grazing. Since BLM holds grazing leases on State Trust Lands on two allotments, Chapter 4 also addresses the impacts of livestock grazing on these State Trust Lands.

- BLM would monitor impacts and adjust management as needed in response to new data derived from monitoring.

Assumptions specific to a given resource are provided in that section. Cumulative impact assumptions are included in Appendix 4.

The following critical resource elements, as set forth in the BLM NEPA Handbook (See Appendix 5, BLM Manual H-1790-1), have been analyzed and are not present or would not be affected by implementing the alternatives:

- **Environmental Justice**--The EIS found that none of the alternatives would have disproportionate adverse human health or environmental effects on minority and low-income populations.
- **Prime and Unique Farmlands**--The planning area has no designated prime and unique farmlands.
- **Native American Religious Concerns**-- Consultation with Native American tribes has found no Native American religious concerns within the planning area.
- **Indian Trust Resources**--There are no Indian Trust Resources that have been identified.
- **Hazardous or Solid Wastes**--No hazardous or solid waste sites or issues have been found within the planning area.
- **Wilderness**--The planning area has no designated wilderness areas and no public lands suitable for wilderness designation.

## **IMPACT ANALYSIS BY RESOURCE TOPIC AND ALTERNATIVE**

### **PHYSICAL RESOURCES AND PROCESSES**

#### **Impacts to Air Quality**

The impacts to air quality under any of the alternatives would be minimal. Restricting vehicle use on some roads under Alternatives 2, 3, and 4 would slightly improve air quality in the short-term. Prescribed fire as part of integrated vegetation treatment under Alternatives 2, 3, and 4 would degrade air quality over the short-term. BLM expects no cumulative impacts on air quality.

#### **Impacts to Water Resources**

**Scope of Analysis:** Impacts to watershed include effects on watershed resources and processes including soils, groundwater, surface water, and vegetation cover.

#### ***Impacts to Watershed***

#### ***Impacts to Watershed from Alternative 1 (Current Management)***

#### **From Desired Resource Conditions**

##### *Watershed: Upland, Riparian, and Aquatic Vegetation Management*

Under current management, soils would remain stable for the short-term, but soil erosion would tend to increase over time due to continued livestock grazing, exclusion of wildfire, and lack of integrated vegetation treatment. Desirable perennial grasses would decrease with the increase in brush. The resulting increase in bare

ground would allow increased runoff of precipitation and increased sedimentation.

With little or no concerted efforts to treat upland vegetation and continued suppression of wildfires, shrubs would continue to invade the uplands at the expense of desirable perennial grasses as a long-term trend. As a result, herbaceous cover on the soil surface would decline with related hydrologic effects including: less infiltration, increased runoff, increased erosion, and increased sedimentation. The planning area might no longer meet Part B of the upland vegetation objective for watershed cover. Over time, increased peak flood flows and sedimentation would likely alter channel maintenance processes and adjust channels (Leopold 1994; Rosgen 1996). Possible undesirable adjustments to Cienega Creek, include bank erosion, filling of pools, and the forming of a wider, shallower stream profile. A lack of integrated vegetation management is likely to cause long-term harm that offsets gains from improved livestock management and other watershed uses.

The lands in the Babocomari watershed are likely to undergo similar harm from a lack of integrated vegetation treatment. But the public land acreage in this area is not large, and lack of vegetation treatment would not greatly influence sedimentation and runoff relationships in the Babocomari River.

##### *Fish and Wildlife, and Cultural Resources Management*

Current management would not affect watershed condition and function. But the presence of endangered species or cultural resources and required mitigation might constrain and add costs to implementing watershed improvement projects.

*Impacts to Watershed from Alternative 1 (Current Management)*

Visual Resource Management (VRM)

Management as VRM Class III might constrain and add costs to implementing projects that benefit watershed conditions.

**From Land Use Allocations**

Mineral Development

Mineral development would not disturb watershed conditions in most of the planning area under Alternative 1, because BLM has not opened the lands acquired in 1988 to mineral entry (48,542 acres or 33% of the watershed). But 458 acres of BLM surface estate and ~~5,915~~ **7,167** acres of subsurface mineral estate could be mined. Before BLM would authorize a mine that would exceed five acres, the mine operator would have to prepare a mining plan of operations with mitigation and site-specific environmental review. Oil and gas development and small-scale (casual use) mining, including the building of access roads and the disturbing of mining sites, are likely to directly harm watershed health. The development of a large-scale mine or the proliferation of small-scale mineral development in the planning area is likely to disrupt hydrologic processes which influence erosion, deposition, and stream function; reduce ground and surface water quantity; and lower water quality.

Large mines often require an influx of development to support operations. The expansion of residential and commercial areas for large-scale mining is likely to lessen ground water resources. A corresponding increase in the use of the planning area is likely to disturb watersheds by generating wildcat roads, increasing number of campsites, **increasing** localized trampling, and increasing **the** incidence of wildfire. The harm could be negligible to severe, depending on the scale, potential for mitigation, and location and type of mine.

Utility Rights-of-Way and Land Use Authorizations

New utility lines could cause short- and long-term harm by disturbing watersheds, mainly from development and service roads. Soil disturbance can be partially mitigated by treatments, including proper engineering of maintenance road drainage and revegetating of disturbance after construction or maintenance. But residual impacts such as service roads are likely to increase runoff, erosion, and sedimentation in the long-term as new corridors proliferate.

Lack of designated utility corridors could help proliferate utility lines in the planning area. It is unknown how many lines would be approved or the locations. However, right-of-way construction for doubling the existing lines, for example, would disturb about 540 acres of watershed in the short-term on public lands. More long-term disturbance from associated service roads is also expected.

Off-Highway Vehicle Management

Limiting off-highway vehicle (OHV) travel to designated roads would protect the soil from cross-country vehicle traffic. OHV control would directly benefit watershed condition.

Road Designations

The planning area's ~~136.4~~ **134.7** miles of roads (e.g., open and restricted to administrative use) amount to ~~198~~ **196** acres of disturbed watershed in the Upper Cienega Creek and Upper Babocomari River basins. Under Alternative 1 this small acreage of roads on relatively stable upland soils would only slightly harm watershed function and promote sedimentation when properly maintained to BLM standards. But the use of 11 fords that cross Cienega Creek on fragile soils directly promotes erosion and sedimentation. These crossings concentrate recreation and extend the area of soil and vegetation disturbance and, therefore, disturb watershed function.

## Chapter 4: Physical Resources and Processes

### Recreation Management

Alternative 1 would establish no recreation zones. Unrestricted camping, hiking, and hunting would cause some small-scale disturbance to the watershed. Group events would need permits with stipulations that would partially mitigate impacts. Revegetation of sites damaged from heavy use would further mitigate impacts. Few group sites would cause watershed damage and such sites would be small.

Areas of concentrated recreation use on public lands currently affect about 20 acres with loss of or reduced vegetation cover and compacted soils. Recreation use is light in the riparian area along Cienega Creek and Mattie Canyon, but is heavy enough in Upper Empire Gulch to cause some trail and light bank damage.

Recreation is growing in the planning area. Under Alternative 1, visitors are likely to camp and create more unauthorized trails in riparian zones. The density of campsites is likely to increase. Bank damage is likely to start erosion on these fragile soils.

### Arizona Trail

Under Alternative 1, the Arizona Trail would not cross the planning area and would therefore not affect watershed conditions.

### Administrative Sites

Designating four administrative sites in areas with existing buildings would continue the more intensive uses at these sites and result in about 105 acres of watershed disturbance.

### Livestock Grazing

#### **Empire-Cienega Allotment**

Under current livestock grazing management, data show that watersheds on the Empire-Cienega allotment are in satisfactory condition with adequate cover and a stable trend (See Chapter 3, Affected Environment, **watersheds**). Nonetheless, watersheds exposed to moderate grazing have decreased infiltration rates which

result in increased runoff from storm events (Gifford and Hawkins 1978). Studies in Dadkhah and Gifford (1980) in the intermountain West found that livestock trampling lowers infiltration rates, but regardless of trampling, sediment yields remain uniform after grass cover reaches 50%. Data from 1991 on the existing watershed condition shows that the current cover averages 57% in the planning area. In desert settings, soil compaction might be offset by invertebrates that aerate and loosen soil (e.g., termites and ants) where plant litter is maintained in sufficient quantities to support large populations of invertebrates (Whitford et al. 1995).

In the long-term, current grazing management should benefit watershed and condition in many areas. An increase in plant density would do the following:

- Increase retention of precipitation and attenuation of floods.
- Increase moisture infiltration into the upland soils and alluvium in ephemeral channels.
- Decrease the upland runoff rate.
- Ultimately recharge the groundwater.

Intense, short-duration grazing, coupled with the resting of pastures, flexible stocking rates, **and vegetation treatments**, would likely improve vegetation cover on the watershed. The current grazing strategy provides a large measure of protection to watershed conditions by the following:

- ~~Continuously~~ Monitoring pasture productivity and use.
- Implementing suitable stocking rates (0-13 **14** head/section).

*Impacts to Watershed from Alternative 1 (Current Management)*

- Rotating pastures to minimize the deterioration of plant and litter soil cover types.

However, the current allowable utilization of 40-60% under the interim grazing plan is higher than that recommended by Holechek et al. (1998) to provide sustainable use compatible with maintaining or improving watershed condition. BLM lacks sufficient utilization data to determine if it has achieved this objective on the Empire-Cienega allotment. A lack of vegetation management is likely to result in long-term harm that offset gains made from improved livestock management and other watershed uses. The risk of damaging vegetation during extended drought is likely to be negated by reducing stocking rates and leaving pastures as reserve forage.

Excluding **about** 450 acres from livestock grazing along Cienega Creek, Mattie Canyon, and Empire Gulch prevents disturbance of fragile bank vegetation and soils. Winter-only grazing in northern pastures that includes two miles of Cienega Creek greatly limits stream bank alteration and sedimentation and benefits soil stability. Livestock using these pastures into April, especially during warm, dry winters, have damaged stream banks. A small negative impact has resulted from a limited amount of bank erosion and sedimentation in some years. Future fencing proposed by the existing interim grazing plan would nearly eliminate the altering of stream banks by livestock.

Over the long-term, stock tanks are likely to harm watershed function and condition. Use of 30+ earthen stock tanks on the Empire-Cienega allotment could disturb up to 1,800 acres (3 mi<sup>2</sup>) (Andrew 1988). But because of the short duration of use, the area disturbed is likely to be less than a third of this amount. The impact would be spread out over the entire allotment. Stock tanks are likely to produce long-term harm to watershed function and condition.

The first phase of building more fencing under Alternative 1 on the Empire-Cienega allotment would not significantly disturb vegetation. The fence lines would not be bladed and as little brush as possible would be cut. Fencing for crossing lanes would have to be rebuilt periodically when damaged by flooding. Little fencing would be required for crossing lanes (300 feet of fence per crossing) and any rebuilt fencing would be routed to avoid vegetation. Fence lines would not need to be cleared. No vehicles would be used in the riparian areas during construction or repair.

Livestock's intermittent use of six existing crossing lanes when moving to fresh pastures would damage vegetation and stream banks for a short period without long-term disturbance because livestock do not use crossing lanes **for more than 10 days annually** -year-round. The rebuilding, repair, and livestock use of crossing lanes **could have varied impacts from those which** are likely to only negligibly degrade watershed and condition **to more major negative impacts, particularly if headcutting is initiated.**

**Use of the Narrows riparian watering area occurs in the non-growing season (between December 1-April 1, depending on the cattle rotation for that year) and use of A & B riparian watering areas occurs predominately during the non-growing season (between December 1-May 1, depending on the cattle rotation for that year). The riparian watering areas are about 8.6% of the total riparian area. Livestock use of these riparian watering areas will result in some damage to stream bank vegetation and banks from trampling. Some consumption of riparian vegetation may also occur in some years at the end of the use period, depending on when the vegetation begins to leaf out and green up which can occur by March 1 in warm, dry winters. Recent monitoring has shown that these riparian areas are either in proper functioning condition or in an upward trend toward proper functioning condition**



#### *Chapter 4: Physical Resources and Processes*

The grazing strategy is the same on about 37,460 acres of leased State Trust Lands contiguous to BLM-managed public lands. The watershed condition on these lands is likely to have the same level of impacts as BLM-managed lands with the same results to watershed condition. Because BLM would manage such a large portion of the watershed to maintain good watershed cover and healthy vegetation, about 74,150 acres or 51% of the Upper Cienega Creek watershed is expected to have satisfactory conditions that limit excessive erosion, stream sedimentation, and flooding while promoting rainfall retention and groundwater recharge.

But in the uplands, grazing (along with other factors) in the absence of vegetation treatments, such as prescribed fire, is likely to slowly facilitate the increased proportion of shrubs such as mesquite and burroweed (National Research Council 1994; Bahre 1995). The result would be more exposed soil surface subject to increased rates of erosion.

#### ***Empirita, Rose Tree and Vera Earl Allotments***

For the Rose Tree, Vera Earl, and Empirita allotments watershed health has not been determined. Alternative 1 would adjust grazing, if needed, to meet the upland objective.

The current allowable utilization of 40-60% is higher than that recommended by Holechek et al. (1998) to provide sustainable use compatible with maintaining or improving watershed condition. BLM lacks sufficient utilization data to determine if this objective has been achieved on the Empirita, Vera Earl, or Rose Tree allotments.

The risk of damaging vegetation, during extended drought, is likely to be negated through stocking rate reduction and leaving pastures as reserve forage on the Empirita allotment under the current grazing plan. But on allotments with fixed stocking rates, during

extended drought, this grazing strategy is likely to degrade the watershed if plants lose vigor due to persistently low soil moisture and continued grazing at fixed levels. The result in the short-term would be large reductions in watershed condition and function. Some of these impacts may persist over the long-term.

The Safford Field Office drought policy used by the Tucson Field Office allows for heavy use (60%) when plants are water stressed. In addition, the policy restricts the use of current year's grass production to 60%. But this policy does not consider that in a drought there might be little or no production during the current year and the rotation of livestock is using last year's production a second time.

Implementing range developments in the Empirita Grazing Plan under Alternative 1 would result in a minimal reduction in watershed condition. The first phase of building more fencing on the Empirita allotment would not significantly disturb vegetation. The fence lines would not be bladed and construction would cut as little brush as possible. The impacts would be short-term and negligible. The fence would be routed to avoid vegetation. Fence lines would not need to be cleared. No vehicles would be used in the riparian areas during construction.

The first phase of building 7.25 miles of pipeline with water troughs would disturb small tracts of upland vegetation and up to 7.5 acres of soil. Fencing for Nogales and Little Nogales Springs and ¼ mile of Cienega Creek at the Narrows would eliminate potential watershed disturbance in the fragile riparian areas where disturbance can accelerate soil erosion. Impacts from range developments on the Rose Tree and Vera Earl allotments would be similar to those described for the Empire-Cienega and Empirita ranches. The exact nature and degree of impacts from these actions would be analyzed in future environmental analysis for specific proposals.

### From Special Designations

#### Areas of Critical Environmental Concern

By not designating ACECs, Alternative 1 might limit the emphasis placed on maintaining the planning area's ecological integrity which affects watershed function. Lack of ACEC designation might reduce the options for resolving management issues related to mixed ownership patterns in the watershed, and indirectly affect relationships, such as water runoff rate (flooding), soil erosion rate, and water infiltration rate. These relationships in turn affect: soil moisture; soil productivity; aquifer recharge; sedimentation of stream channels; and stream channel width, depth, and shape. **BLM could not acquire State Trust and private lands through the Land and Water Conservation Fund. Prior to NCA designation, lack of an ACEC designation might have made it difficult to acquire additional lands or conservation easements in the planning area. Lack of an ACEC designation would also result in not highlighting the area for certain budget requests which could direct more agency resources to the area.** Without some of the management changes prescribed under ACEC designation, a variety of activities that disturb vegetation and soils would be more likely to occur on BLM-administered public lands. The lack of designation is likely to indirectly **result in the disturbance** of the vegetation cover and plant litter that protect the soil surface from erosion.

#### **Summary--Alternative 1 on Watershed**

Under current management, existing and potential concentrated activities (e.g., roads, rights-of-way, administrative sites, recreation sites, and livestock developments) disturb at most 2,660 acres of public lands distributed throughout the planning area, representing only 5.5% of the public lands in the Upper Cienega Creek basin. Dispersed recreation would potentially affect all 49,000 acres of public land in the watershed. Livestock grazing would

affect 41,855 acres. About ~~6,730~~ **7,265** acres of public land and federal mineral estate have the potential for being mined.

Under Alternative 1, BLM would adjust grazing, if needed, to meet the upland vegetation objective. But BLM is likely to meet with limited long-term success without integrated vegetation treatments and, in some cases, changes in the drought policy. Utility rights-of-ways would likely proliferate in the basin as the population continues to grow and new technologies are distributed to rural areas, degrading watershed condition. Mining for locatable and leaseable minerals and mineral material sales could degrade watershed condition over large areas in the Cienega Creek basin and to a lesser extent in the Babocomari basin. The current level of dispersed recreation is resulting in limited watershed disturbance. If not regulated, recreation would likely increase dramatically with time. Alternative 1 might fail to meet the upland vegetation and riparian objectives in the long-term.

#### **Cumulative Impacts--Alternative 1 on Watershed**

Under current management, the watershed of Cienega Creek would remain stable and functional over the short-term. In the short-term, current grazing management would continue to maintain and improve watershed condition on 64,649 acres of State Trust Lands in addition to the 41,855 acres of public lands. Impacts of concentrated uses, including roads, utility lines, and range improvements, would occur on both public and State Trust Lands at about the same levels.

**The implementation of the existing Land Tenure Plan Amendment to the Safford District RMP which is carried forward in this plan will help preserve watershed conditions inside the NCA and surrounding basin, resulting in a long-term positive impact. If this land is not purchased for conservation, future developments of private**

**and State Trust Lands in the area is a near** certainty as the human population in southern Arizona continues to grow. Large scale development can change runoff and sediment relationships resulting in the destabilization of **stream channels (Dunne and Leopold 1978).**

Over the long-term watershed condition would tend to deteriorate. Trees and brush would tend to increase over the perennial grasses in the plant communities. Operating cattle ranches would continue to be subdivided for residential development. Road networks would expand. And drainage patterns would tend to be channelized. The result of this slow unplanned development would be the following:

- Less open space.
- Decreased infiltration of precipitation into the soil profile.
- Increased surface runoff.
- Higher peak flood flows.
- More rapid transport of water through the watershed.
- Less aquifer recharge.
- Briefer surface flows in Cienega Creek.
- Less water held in the watershed.

Recreation uses would continue to expand as urban dwellers seek escape from cities. Land use authorizations would also tend to increase. As people move out to the Sonoita area, the demand for rights-of-way to access private lands would increase as would the need to bring utilities to new homesites.

## *Impacts to Watershed from Alternative 2*

### **From Desired Resource Conditions**

#### *Watershed: Upland, Riparian, and Aquatic Vegetation Management*

The ~~activity plan~~ actions common to Alternatives 2, 3, and 4 would determine the cause of erosion in lower Wood Canyon and take steps to reduce or stop the erosion. These action alternatives would also repair abandoned stream crossings and other disturbed locations on stream banks and terraces along Cienega Creek and its tributaries. This repair would reduce the level of sedimentation entering Cienega Creek and conserve productive soil resources. Roads found to contribute to excess sedimentation would undergo design changes to prevent further erosion.

BLM is working with other land owners in the watershed to promote watershed health, which benefits public lands by reducing excess sedimentation and flooding and retention of rainfall. As a result, infiltration and groundwater recharge would increase on downstream public lands. In the long-term watershed management is expected to benefit watershed conditions.

Management actions common to ~~the activity plans for~~ Alternatives 2, 3, and 4 would have a distinct advantage over Alternative 1 by improving watershed condition and meeting the upland and riparian objectives. Vegetation treatments (e.g., prescribed fire, fuel wood cutting, and herbicides) on **almost up to 20,000 acres (14% of the watershed), identified as needing treatment through Ecological Site Inventories,** would improve watershed condition over the long-term by reducing and slowing the spread of the shrubs in favor of the herbaceous plants. **Treatments on additional acreage would be proposed, as a result of monitoring, and would have similar benefits when implemented.** Dense perennial grass cover is important to watershed health and related hydrologic and soil

stabilizing processes. The treatments would mitigate the effects of livestock grazing (Alternatives 2 and 3) on ecological sites where livestock promote shrub invasion. **Setting guidelines** Requiring permits for collecting plants would help prevent the unneeded disturbance from over collecting vegetation. The over collecting could harm areas especially sensitive to erosion (i.e., soils in bottom lands) **but plant collections would likely result in small scale impacts.**

**But** Prescribed fire might cause localized short-term harm by increasing erosion rates before vegetation soil cover returns. This type of impact would be largely mitigated by the following:

- Controlling fire intensity.
- Controlling the size of burn units.
- Sequencing units burned annually to spread out impacts over large areas and at different times.
- Ensuring adequate rest from grazing after burning.

Individual burn plans for each year would incorporate this mitigation to protect sensitive areas and reduce post-burn erosion. Thus, the spreading out of prescribed fire over space and time would buffer the watershed, especially stream channels from excess sediment and ash.

Under Alternative 2, BLM would implement an integrated vegetation management treatment strategy to include all the public lands in the planning area. This strategy would also encourage collaboration by adjacent land owners in designing treatments that include suitable State Trust and private lands to create the most logical and economic units possible. The strategy would be to maintain current ecological site inventories which would

determine existing ecological condition. If the current soil and vegetation conditions are not highly similar to desired conditions, BLM would design and implement a vegetation treatment.

This strategy would maintain the desired soil and vegetation conditions on public lands as well as suitable State Trust and private lands. This strategy would tend to look at the entire watershed and direct resources from multiple partners to improving conditions where the changes are most needed to improve watershed health and function.

#### *Fish and Wildlife Management*

Under Alternative 2 in the long-term, habitat improvements would enhance vegetation structure and increased cover would promote healthy watershed conditions.

#### *Visual Resource Management (VRM)*

Visual resource management as VRM Class II under Alternative 2 would place more constraints, and potentially more costs, on watershed projects than under current management, including vegetation treatment and restoration.

#### *Cultural Resource Management*

Under Alternative 2, cultural resource management might slightly harm watershed condition and function. Developing the Empire Ranch headquarters would likely attract increased visitation and general recreation, such as camping and hiking. The result would be more vegetation and soil disturbance. Specific site design would reduce erosion and any uncontrolled runoff from the headquarters. Visitors and staff would increase the amount of water used at the headquarters from that under Alternative 1. Public education and interpretative programs on the watershed would increase awareness of the issue and might improve visitor behavior.

## From Land Use Allocations

### Mineral Development

Under Alternative 2, watershed stability is likely to benefit in the long-term from restrictions on mineral development of acquired public lands and the continued closure and withdrawal of 48,542 acres and withdrawal of 7,265 acres (together representing 33-38% of the Upper Cienega Creek watershed) to mineral development. Restricting mineral development would ensure that extensive mining would not compromise watershed integrity through surface disturbance and water quality through inadvertent release of toxic materials (Nelson et al. 1991). The administrative and casual use of a limited amount of sand and gravel, boulders, and clay is likely to inflict small to negligible harm on watershed function and condition.

### Utility Rights-Of-Way and Land Use Authorizations

Alternative 2 would restrict utility rights-of-ways to two existing corridors, whereas Alternative 1 would allow for corridors to proliferate across the landscape, spreading disturbance and maintenance roads. More utility development on public lands along the El Paso gas line is likely to disturb at most 30 acres of public lands over the short-term as underground utilities are installed. Service roads could disturb another acre of public lands in the long-term, slightly degrading watershed condition.

Designating a second utility corridor across, three miles of public lands with existing overhead utility lines would disturb at most 240 acres in the short-term. In the long-term disturbance from service roads would amount to about one acre of public land. In the short-term, placing utility lines to capacity in the two corridors and allowing utility lines to cross other

jurisdictions in the same capacity would disturb at most 270 acres of public land and 1,280 acres total in the watershed (0.8 % of the watershed).

New and existing service roads in the long-term would disturb two acres of public lands and 45 acres of other lands in the watershed. Treatments such as the following could partially mitigate soil disturbance: (1) proper engineering of maintenance road drainage, and (2) revegetating disturbance after construction or maintenance. But residual impacts, such as service roads are likely to increase runoff, erosion, and sedimentation. This level of disturbance is likely only to slightly disrupt watershed conditions in the long-term.

### Off-Highway Vehicle Management

Impacts under Alternative 2 would be the same as under Alternative 1.

### Road Designations

Under Alternative 2 the road network (e.g., open, seasonal use, and restricted to administrative use) would total 122 miles and disturb 177 acres of watershed. The presence of 6.6 miles of nonmotorized single track (converted from roads) would disturb 4.8 acres of watershed. Under Alternative 2, BLM would retire and rehabilitate 16 13.7 miles or 23.2 20 acres (12 10%) of the planning area's 136.4 134.7 mile (198 196-acre) road system. **Design and maintenance of the road system will be improved on those road segments that are identified as contributing to erosion.** These actions would benefit watershed health by stabilizing road segments threatened by erosion. Many of these segments lie along stream banks and in floodplains along Cienega Creek **but occur in upland areas as well.**

### Recreation Management

Recreation management described for Alternative 2 is likely to benefit watershed in the long-term and would help meet the upland vegetation objective. The level of impact from

recreation is difficult to estimate. At least a few thousand people use the planning area annually. Establishing recreation zones under Alternative 2 would limit the extent of camping-related soil disturbance on 4,613 acres (3% of the watershed) which will become important in the long-term as visitation increases. The remaining 44,387 acres (30% of the watershed) of public land would remain open to dispersed recreation including camping, hiking, and hunting.

At first, dispersed recreation would only slightly disturb the watershed. But disturbance would likely increase over time as visitation increases into the tens-of-thousands annually. BLM would have to monitor the extent of impacts and consider further restrictions to sustain watershed conditions that will meet the upland objective. Recreation under Alternative 2 would harm watershed conditions slightly to moderately, depending on the level of use.

Several **management** actions under the activity plan **Alternative 2** would substantially benefit soil stability which is important to watershed conditions. Restrictions on gold prospecting and on camping and group activities in riparian areas would lessen the potential for bank disturbance and channel degradation. Establishing three group sites, four camp areas, and at least 11 pullouts would disturb vegetation cover and soil on 37 acres. Foot and vehicle travel to and around these sites would likely disturb more acreage.

#### Arizona Trail

Building the Arizona Trail under Alternative 2 would disturb four acres of watershed. Associated camping sites and wildcat spur trails would disturb more areas. This disturbance would only slightly harm watershed function when compared to no trail under Alternative 1.

#### Livestock Grazing

##### **Empire-Cienega and Empirita Allotments**

On these two allotments, livestock grazing

management under Alternative 2 would improve watershed conditions and help meet the upland and riparian objectives better than would Alternative 1. Adaptive management of livestock numbers and rotation systems adjusted for current grass production would likely improve soil cover conditions and stability. A formal interdisciplinary Biological Planning Team, coupled with more intensive monitoring, would allow for improved grazing management over time as described for Alternative 1.

Planning pasture rotations and stocking rates not to exceed an average of 35% utilization (moderate use level) of the current year's production in semidesert grasslands and meeting cover requirements under the upland objective are likely to allow sustainable use compatible with maintaining or improving watershed condition in the short-term (Holechek et al. 1998).

Vegetation treatments would improve watershed condition over the long-term by reducing and slowing the spread of the shrubs in favor of the herbaceous plants, especially perennial grasses. The risk of vegetation damage and watershed degradation, during extended drought, is likely to be negated by reducing the stocking rate and leaving pastures as reserve forage in response to current range condition and productivity. The grazing strategy would also improve the condition of intermingled State Trust Lands that would be managed with BLM lands as one unit.

The further enclosure of grazing along riparian areas on Cienega Creek and at Nogales and Little Nogales Springs, where soils are fragile and stabilized entirely by vegetation, would extend protection of these sensitive areas. Adding an extensive amount of enclosures (**about** 2,319 acres under Alternative 2 versus **about** 659 acres under Alternative 1) on the watershed in different range sites would allow for a comparison of conditions, including soil cover and soil stability in relation to grazing

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management, as recommended by Bock and Bock (1993).

##### ***Rose Tree Ranch and Vera Earl Allotments***

On these two allotments, grazing management under Alternative 2 would eventually improve watershed conditions and help attain the upland and riparian objectives better than would Alternative 1.

Obtaining information on ecological site types and condition would allow formulating a stocking rate and rotation system that is adaptive to current watershed conditions and grass production. When coupled with vegetation treatments, the stocking rate and rotation system would likely improve soil cover and stability over the long-term.

This strategy should present only a slight risk of watershed degradation during extended drought. Implementing **about** 600 acres of exclosures on the Rose Tree and Vera Earl allotments (none under Alternative 1) in different ecological sites would allow for a comparison of conditions, including soil cover and soil stability, in relation to grazing management, as recommended by Bock and Bock (1993).

##### ***Empire Mountains Allotment***

The creation of a new allotment in the Empire Mountains could degrade watershed condition. Depending on soil conditions, some level of watershed impairment from even moderate levels of grazing is likely to decrease infiltration and increase runoff (Gifford and Hawkins 1978). On the other hand, the proposed vegetation treatments would likely improve watershed condition over the long-term by reducing and slowing the spread of the shrubs in favor of herbaceous plants. Dense perennial grass cover is important to watershed health and related hydrologic and soil-stabilizing processes. The treatments would mitigate the effects of livestock grazing on ecological sites where past livestock grazing has promoted shrub invasion.

Implementing a flexible stocking rate based on the current year's production and rotation of season of use of pastures would prevent over using vegetation during droughts. These measures are thus expected to maintain the improvements in grass composition and density resulting from vegetation treatments. Exclosing **about** 480 acres from livestock grazing in the Empire Mountains allotment in different ecological sites would allow for a comparison of conditions, including soil cover and soil stability, in relation to grazing management, as recommended by Bock and Bock (1993).

Watershed condition might decline on the allotment if adjacent land owners prevent the implementing of vegetation treatments proposed to restore shrublands to grasslands because of "urban interface" issues related to prescribed fire. Grazing this allotment without vegetation treatments would likely increase the rate of shrub invasion and contribute to watershed degradation. The result would be a small to moderate decline in watershed integrity. In this case, the allotment might not meet BLM's Arizona Standards for Rangeland Health and Guidelines for Grazing Administration. This failure could lead to the allotment's eventual discontinuation.

#### **From Special Designations**

##### *Areas of Critical Environmental Concern*

Designating a 45,859-acre (31% of watershed) ACEC would benefit the planning area by emphasizing the protection of its unique ecology. Protecting watershed function and maintaining good watershed conditions are essential to supporting the area's rare biotic communities (Fleischner 1994) and especially aquatic communities (Amour et al. 1991; Meehan 1991). ACEC designation would facilitate the acquiring of more lands or conservation easements, which would allow watershed health to improve over a larger

*Summary--Alternative 2 on Watershed*

proportion of the planning area. The ACEC designation would likely direct more agency resources to conserving the planning area's watershed.

***Summary--Alternative 2 on Watershed***

Under Alternative 2, the watershed of Cienega Creek would remain stable and functional over the short-term and possibly the long-term. This alternative proposes concentrated activities (e.g., roads, rights-of-way, administrative sites, recreation sites, and livestock developments) that could disturb as much as 2,400 acres of public lands distributed throughout the planning area, representing only about 5% of the public lands in the Upper Cienega Creek basin. Dispersed recreation impacts would potentially occur on 44,387 acres of public lands. Livestock grazing impacts would occur on 42,155 acres of public lands. Another 6,730 7,265 acres with the potential of being mined are proposed for mineral withdrawal under Alternative 2, subject to valid existing rights. The withdrawal would virtually eliminate the risk of impacts from mineral development.

Alternative 2 places more emphasis on maintaining and improving overall watershed health than do Alternatives 1, 3, or 4 because of its emphasis on ecosystem management and collaboration. Improving watershed condition while limiting disturbance, the proposed management for Alternative 2, would include the following provisions:

- Closing selected roads.
- Closing the planning area to mining (except for valid existing claims).
- Allowing flexible livestock stocking rates.
- Establishing exclosures for 15% of rangelands.
- Restricting recreation.

- Designating an extensive ACEC to protect the ecological integrity of the entire planning area.

These provisions would help meet upland vegetation and riparian objectives in the short- and long-terms in most of the planning area when coupled with the following management actions common to activity plans for Alternatives 2, 3, and 4:

- Applying vegetation treatments to increase grass and limit shrubs.
- Restricting riparian camping.
- Not allowing sand and gravel sales.
- Coordinating watershed management with other entities.
- Preventing excessive erosion in Wood Canyon.

Applying the proposed grazing systems to State Trust and private lands that are part of the BLM grazing allotments would ultimately benefit watershed condition in the following ways:

- Open space would be maintained.
- More precipitation would infiltrate the soil profile reducing surface runoff and peak flood flows.
- Aquifers would be more thoroughly recharged.
- Cienega Creek would have longer periods of surface flows.
- Periods of high soil moisture would last longer across the watershed (See Cumulative Impacts section below).



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Alternative 2 would meet the upland vegetation and riparian objectives by controlling shrub invasion. Coupled with improved grazing management, the control of shrubs under Alternative 2 would increase soil cover and ~~much more~~ benefit watershed condition in the long-term **much more** than would Alternative 1.

Allowing for limited administrative use of mineral materials under Alternative 2 would provide a source of materials for watershed projects. This source could lower costs while ensuring healthy watershed conditions.

Coordinating with private land owners and the Forest Service would likely improve management on adjacent lands that influence runoff and sediment entering BLM watercourses and help to meet both objectives. BLM would investigate, treat, and monitor excessive erosion in Wood Canyon to conserve soil.

#### ***Cumulative Impacts--Alternative 2 on Watershed***

Under Alternative 2, the Cienega Creek watershed would remain stable and functional over the short-term and possibly the long-term. In the short-term, current grazing management would continue to maintain and improve watershed condition on 64,649 acres of State Trust Lands, in addition, to the 42,155 acres of public lands with grazing in the watershed. Impacts of concentrated uses, involving roads, utility lines, and range improvements, would degrade the watershed on both State Trust and public lands. But impacts on State Trust Lands might be greater than on public lands, which would have designated utility corridors, roads, and recreation sites.

Continuing public lands grazing on the planning area's ranches would increase the likelihood that they would continue as operating cattle ranches. Such grazing would also encourage ranch families to collaborate with BLM and the Arizona State Land Department in the ranching

operation and to manage State Trust and private lands they own or lease as open space. Over the long-term, improved grazing management and vegetation treatments would maintain watershed health and reduce encroaching woody species in favor of desirable perennial grasses.

The continued existence of large ranches would slow development by reducing the amount of State Trust and private lands open to residential development in the Sonoita Valley. Open space would be maintained. More precipitation would infiltrate the soil profile, reducing surface runoff and peak flood flows. More water would recharge the aquifer. Surface water in Cienega Creek would flow for longer periods. And the watershed would hold more water.

**The implementation of the proposed Las Cienegas Acquisition Strategy (Appendix 2) and the existing Land Tenure Plan Amendment to the Safford District RMP will help preserve watershed conditions inside the NCA and surrounding basin, resulting in a long-term positive impact to a greater extent than Alternative 1.**

#### ***Impacts to Watershed from Alternative 3***

##### **From Desired Resource Conditions**

##### *Watershed, Fish and Wildlife, Visual and Cultural Resource Management*

Impacts under Alternative 3 would be the same as under Alternative 2.

##### **From Land Use Allocations**

##### *Mineral Development*

Mineral development under Alternative 3 could affect watershed conditions more extensively than under Alternative 1. Under this alternative, ~~46,915~~ **47,807** acres of public and split-estate lands would be open to mining and mineral material sales (sand and gravel) as compared to the ~~6,373~~ **7,265** acres of public and split-estate

lands under Alternative 1. Mineral development that resulted in extensive mining would likely compromise watershed integrity through surface disturbance and water quality through inadvertent release of toxic materials (Nelson et al. 1991). But designating 4,859 acres as areas of critical environmental concern would protect the stream corridor along Cienega Creek from surface occupancy during mineral development.

#### Utility Rights-Of-Way and Land Use Authorizations

Utility rights-of-way and land use authorizations under Alternative 3 would affect watershed conditions much as under Alternative 2. In the short-term, adding a third utility corridor could disturb 13 more acres of public lands and 15 more acres in other jurisdictions within the watershed.

#### Off-Highway Vehicle Management

Impacts under Alternative 3 would be the same as under Alternative 1.

#### Road Designations

The road network under Alternative 3, (e.g., open, seasonal use, and restricted to administrative use) would total ~~125.5~~ **124.3** miles and disturb about ~~182~~ **180** acres of watershed. The ~~7.6~~ **6.8** miles of nonmotorized single track (converted from roads) trail would disturb ~~5.5~~ **4.9** acres of watershed. Under Alternative 3, BLM would close ~~11.4~~ **9.8** miles or ~~16.5~~ **14.2** acres of road, a reduction of only ~~8~~ **7**% of the existing road network much less than under Alternatives 2 or 4. BLM would close roads mostly in sensitive areas along Cienega Creek. Only one road **crossing across the perennial portion of Cienega Creek** would remain and BLM would rehabilitate the rest of the crossings to reduce erosion. Road closings **and improved road maintenance and design** under Alternative 3 would improve watershed conditions more than under Alternative 1, but less than under Alternatives 2 and 4.

#### Recreation Management

Recreation management described for Alternative 3 is likely to have a more beneficial long-term impact than under all the other alternatives and would go further in helping to meet the upland vegetation objective. Recreation zones established under Alternative 3 would limit camping-related soil disturbance on 17,690 acres (12% of watershed). The remaining 31,040 acres (21% of the watershed) of public land would remain open to unregulated, dispersed recreation.

Under Alternative 3, dispersed recreation would only slightly disturb the watershed, but disturbance would likely increase over time. As recreation increases over time, BLM would have to monitor impacts and consider further restrictions to sustain watershed conditions that would meet the upland objective. Recreation under Alternative 3 would slightly to moderately harm watershed conditions depending on the level of use.

Establishing five group sites, five camp areas, and at least 14 pullouts would disturb soil and vegetation cover on 52 acres. Foot and vehicle travel to and around these sites would likely disturb more acreage.

#### Arizona Trail

Building the Arizona Trail under Alternative 3 would disturb five acres of watershed. Associated camping and wildcat spur trails would disturb slightly more land. Through the Narrows portion of Cienega Creek, the Arizona Trail would pass along the floodplain over soils that are fine textured and highly susceptible to erosion. Periodic flooding would degrade the trail, potentially causing secondary channels that alter stream function and contribute to sedimentation. The overall impact under Alternative 3 would be more harmful to watershed function than under Alternative 1.

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### Livestock Grazing

#### **Empire-Cienega Allotment**

Grazing management under Alternative 3 would be more likely to degrade watershed conditions over the long-term than grazing management under Alternative 1, because of potentially slower adjustments in drought years under Alternative 3. The average stocking rate of nine head year-long per section is conservative (NRCS 1988) and close to the annual average stocking rate under Alternatives 1 and 2. This stocking rate, variable pasture rotation, and annual deferment and seasonal rest of pastures should maintain good watershed conditions that would meet the upland vegetation objective in most years. In addition, vegetation treatments under Alternatives 2, 3, and 4 would likely prevent shrub encroachment and promote an increased cover of perennial grasses, which tends to improve watershed conditions.

Impacts from installing stock tanks, pipelines, and fencing would be similar to those described for the Empire-Cienega allotment under Alternative 1. BLM would analyze impacts from these activities in future environmental analyses for specific proposals. But during extended drought this grazing strategy is likely to degrade the watershed if plants lose vigor due to persistently low soil moisture and continued grazing at fixed levels as described in impacts under Alternative 1.

#### **Empirita, Rose Tree, Vera Earl, and Empire Mountains Allotments**

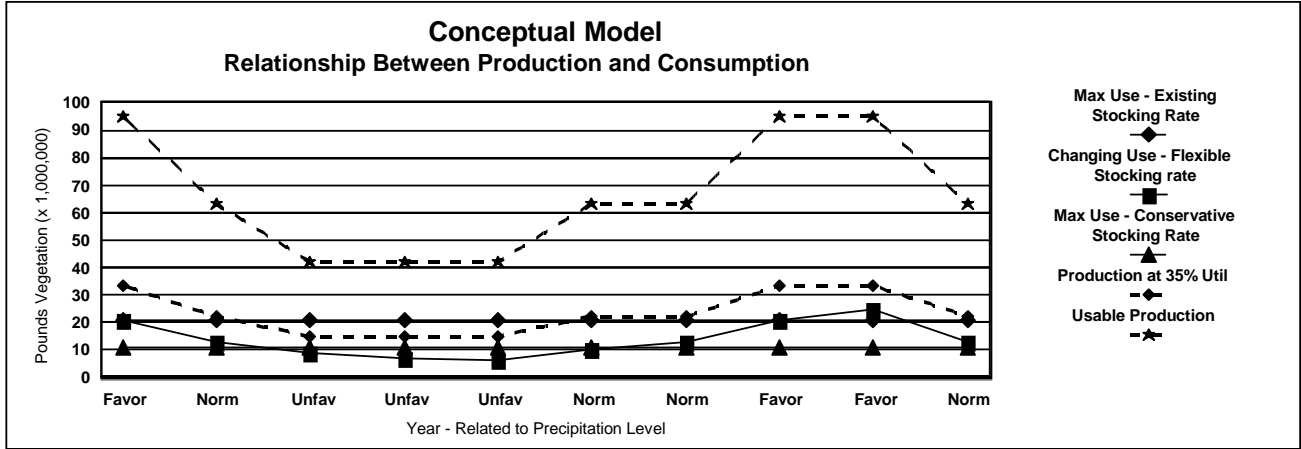
On all four of these allotments, livestock grazing management under Alternative 3 would affect watershed conditions much as under Alternative 1 except livestock would graze 1,040 more acres on the Empirita allotment under a variable (next best pasture) system with annual rest. BLM would implement variable (next best pasture) systems with annual rest on the other three allotments. A fixed stocking rate of seven head per section for the Empirita, nine head per section for the Vera Earl, and five head per

section for the Empire Mountains is conservative (NRCS 1988).

Conservative stocking rates, pasture rotation to prevent grazing from exceeding an average of 35% utilization (moderate use level), and meeting the cover requirements under the upland objective in the short-term are likely to allow sustainable use compatible with maintaining or improving watershed condition (Holechek et al. 1998) in the short-term.

Vegetation treatments would likely improve watershed condition over the long-term by reducing and slowing the spread of shrubs in favor of herbaceous plants, especially perennial grasses. But during extended drought this grazing strategy is likely to degrade watershed conditions on the four allotments, if plants lose vigor due to persistently low soil moisture and continued grazing at fixed levels. This type of grazing management would present more risk of harming watershed condition and function over the long-term than grazing under Alternatives 1 or 2.

The potential impacts of fixed stocking rates compared to flexible stocking rates can be illustrated in a simplified model that shows the relationship between vegetation consumption by livestock at different stocking rates and available useable vegetation production (Figure 4-1). This model shows that the benefit of a flexible stocking rate (Alternative 2), coupled with adequate monitoring, has the benefit of allowing livestock numbers to be adjusted to track annual forage production. **The useable forage is that portion of the total** forage production that is accessible to livestock and can be grazed without damage to the health of the plant. It is determined by dividing the total vegetation production in half and multiplying the result by the allowable utilization rate.



This management approach minimizes the risk of using too much of the forage production that needs to be left as vegetation cover for watershed or wildlife. A large portion of the useable forage is left ungrazed so it is available for needed adjustments resulting from unexpected changes in resource conditions or other issues.

The risk of set stocking rates, even at conservative levels, is apparent. The set conservative stocking rate (Alternative 3) comes close to annual production levels available useable at an average 35% utilization rate, and the set maximum stocking rate currently permitted (under Alternative 1) approaches or exceeds the annual production available useable at a 35% utilization rate. In unfavorable years (i.e., drought) this strategy results in livestock consuming much of the annual production and leaving little cover for soil or wildlife.

**From Special Designations**

Areas of Critical Environmental Concern

The management of areas of critical environmental concern (ACECs) under Alternative 3 would affect watershed condition

and function much as under Alternative 2, except that the scope of protection under Alternative 3 would be reduced by 90% to cover 4,859 instead of 45,859 acres. Opportunities for acquiring land would be limited. Moreover, Alternative 3 would not protect Upper Empire Gulch Spring and several other springs and seeps with special management.

**Summary--Alternative 3 on Watershed**

Under Alternative 3, the watershed of Cienega Creek would remain stable and functional over the short-term and possibly the long-term. This alternative proposes concentrated activities (e.g., roads, rights-of-way, administrative sites, recreation sites, and livestock developments) that could disturb as much as 2,440 acres of public lands distributed throughout the planning area, but representing only about 5% of the public lands in the Upper Cienega Creek basin. Dispersed recreation impacts could occur on 44,387 acres. Livestock grazing impacts would occur on 43,895 45,375 acres. Impacts from mineral development could occur on any of the 46,915 47,807 acres open to mineral entry. Of all the alternatives, Alternative 3 least emphasizes maintaining and improving watershed health.

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An ACEC to protect the ecological integrity of the riparian areas described for this alternative would likely have limited success because this alternative would risk disturbing watershed conditions, such as increased soil cover and soil stability. Alternative 3 places the watershed at substantial risk of disturbance from mining and mineral material sales (sand and gravel) while protecting the core riparian area from surface occupancy related disturbance. Road closures would be few but directed at the areas most sensitive to erosion, such as those along Cienega Creek.

Moderate grazing stocking rates, coupled with vegetation treatment, would likely improve the watershed in the long-term. But fixed grazing rates would leave watershed condition at risk of periodic injury during extended droughts (Figure 4-1). In addition, BLM would have to develop a new grazing plan if livestock grazing is not meeting the upland vegetation objective due to this potential problem. In contrast, established recreation zones would limit camping-related soil disturbance on a much larger acreage than the other alternatives, benefitting watershed conditions more than under the other alternatives.

Though less than under Alternatives 1 and 2, these actions would help meet upland vegetation and riparian objectives in the short-and long-term in most of the planning area when coupled with the following management actions common to Alternatives 2, 3, and 4:

- Treating vegetation to increase grass and limit shrubs.
- Restricting riparian camping.
- Coordinating watershed management with other entities.
- Preventing erosion in Wood Canyon.

Watershed condition would also improve as a result of using the proposed grazing systems on State Trust and private lands that are part of BLM grazing allotments. Traditionally, State Trust Lands are not managed conservatively to improve productivity or watershed conditions. These benefits under Alternative 3 would likely manifest themselves less than under Alternatives 1 or 2, but more than under Alternative 4.

#### ***Cumulative Impacts--Alternative 3 on Watershed***

Under Alternative 3, the watershed of Cienega Creek would remain stable and functional over the short-term and possibly the long-term. In the short-term, current grazing management would continue to maintain and improve watershed condition on 64,649 acres of State Trust Lands, in addition, to the 43,895 45,375 acres of public lands with grazing in the watershed. Impacts of concentrated uses involving roads, utility lines, and range improvements would degrade the watershed on both State Trust and public lands. But impacts on State Trust Lands might be greater than on public lands, which would have designated utility corridors, roads, and recreation sites.

As under Alternative 2, maintaining public lands grazing on the existing ranches in the planning area under Alternative 3 would increase the likelihood of their continuing to operate cattle ranches and would encourage ranch families to collaborate with BLM and the Arizona State Land Department in the ranching operation and to manage as open space the State Trust and private lands they own or lease. ~~The ranches might be less economically viable with the more conservative stocking rate, but Alternative 3 would still tend to maintain the open space needed for wildlife and water production.~~ The continued existence of large ranch units would slow development by reducing the amount of State Trust and private lands open to residential development in the Sonoita Valley. Like Alternative 2, Alternative 3 would maintain

## *Impacts to Watershed from Alternative 4*

open space, allowing more precipitation to infiltrate the soil profile and reducing surface runoff and peak flood flows. More water would recharge the aquifer, surface water in Cienega Creek would flow for longer periods, and the watershed would hold more water than if it were developed. Over the long-term, watershed health would be maintained by improved grazing management and vegetation treatments to reduce the encroachment of woody species in the plant communities in favor of desirable perennial grasses. But fixed stocking rates would place the watershed condition at risk of periodic widespread injury during extended droughts.

**The implementation of the proposed Las Cienegas Acquisition Strategy (Appendix 2) and the existing Land Tenure Plan Amendment to the Safford District RMP will have the same long-term positive impact as described for Alternative 2.**

### *Impacts to Watershed from Alternative 4*

#### **From Desired Resource Conditions**

##### Watershed: Upland, Riparian, and Aquatic Vegetation Management

**Impacts under Alternative 4 would be much the same as under Alternative 2. However,** under Alternative 4 upland vegetation conditions on public lands ~~would~~ **might** not improve as rapidly as under Alternatives 1, 2, or 3 because of the difficulties in conducting joint management activities, such as vegetation treatments under a more fragmented land management approach. ~~About 110 miles of fence would be needed to segregate BLM lands. Fencing of the public lands to exclude livestock would result in a patchwork of State Trust Land more suited for disposal than ranching.~~

**Under Alternative 4,** livestock would not graze the public lands, and **although** BLM would treat

these areas to improve vegetation and watershed condition, improving the ecosystem on a large scale would be more difficult. If BLM retires the federal grazing leases and sells the state grazing leases (37,462 acres on the Empire-Cienega allotment and 23,468 acres on the Empirita allotment), due to lack of funding for obtaining commercial leases, then BLM would have little involvement in the planning or management actions on the Empirita or Vera Earl ranches due to lack of land ownership or lease agreements. BLM would then have management responsibilities on only about half of what is currently managed cooperatively on the Empire-Cienega and Rose Tree ranches.

**However, if BLM or another entity applied for and received conservation use on the State Trust lands (which is now a possibility based on a recent court decision), then it might be possible to implement the vegetation treatments and other watershed actions on more of a landscape scale under Alternative 4 as well.**

##### Fish and Wildlife, Visual and Cultural Resource Management

Impacts under Alternative 4 would be the same as under Alternative 2.

#### **From Land Use Allocations**

##### Mineral Development

Alternative 4 would affect watershed function and condition the same as Alternative 2.

##### Utility Rights-of-Way and Land Use Authorizations

Alternative 4 would better protect watershed function and condition than would Alternatives 1, 2, or 3, which would allow two or more corridors to be developed. The designation of a single utility corridor with existing overhead utility lines in the short-term could disturb at most 240 acres of public lands and 1,160 acres

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on other jurisdictions in the watershed. The corridor could also result in continued long-term disturbance on service roads, amounting to about one acre on public lands and 14.5 acres total.

Soil disturbance could be partially mitigated by treatments, including proper engineering of maintenance road drainage and revegetating disturbance after construction or maintenance. But residual impacts such as service roads are likely to increase runoff, erosion, and sedimentation. This level of disturbance is likely only to slightly disrupt watershed conditions in the long-term.

### Off-Highway Vehicle Management

Impacts under Alternative 4 would be the same as under Alternative 1.

### Road Designations

Impacts under Alternative 4 would be similar to those under Alternatives 2 and 3. The road network under Alternative 4 (e.g., open, seasonal use, and restricted to administrative use) would total ~~116.4~~ **115.4** miles and disturb ~~168.7~~ **167.2** acres of watershed. BLM would rehabilitate ~~27.6~~ **25.5** miles of roads or about ~~40~~ **37** acres (~~20~~ **19**%) of the planning area's ~~199~~ **196** acres of roads, including sensitive areas along Cienega Creek. Only one road would continue to cross **a perennial reach of Cienega Creek** ~~the creek~~. Rehabilitating the other crossings would reduce erosion. The ~~29.6~~ **31.1** miles of restricted use roads would help prevent wildcat roads in sensitive areas on the watershed. **Reduction of wildcat road proliferation, creek crossings and improved road maintenance and design will have a beneficial impact on watershed condition.**

### Recreation Management

Recreation under Alternative 4 would disturb watershed conditions less than under Alternative 1, but potentially more than under Alternatives 2 or 3. Recreation zones would limit camping-

related soil disturbance on 3,270 acres (2% of the watershed). The remaining 45,730 acres of public land would remain open to dispersed recreation, including camping, hiking, and hunting. Such recreation would only slightly disturb the watershed at first, but disturbance would likely increase over time. As under Alternative 2, recreation under Alternative 4 would harm watershed conditions slightly to moderately, depending on the level of use.

Establishing one group site, four camp areas, and at least 10 pullouts would disturb about 27 acres of vegetation cover and soil. Foot and vehicle travel to and around these sites would likely disturb more acreage.

### Arizona Trail

Routing the Arizona Trail along existing roads would eliminate more disturbance of watershed surface area from construction. Some wildcat spur trails would negligibly disturb land along the trail. Locating the trail under Alternative 4 would affect watershed conditions much as under Alternative 1.

### Livestock Grazing

Under Alternative 4, livestock grazing would cease on 41,855 acres of BLM-managed land or 29% of the Upper Cienega Creek watershed. This area would meet the upland vegetation objective and benefit watershed function and condition for public lands under Alternative 4 more than it would under Alternative 1. This would not **necessarily** be the case on adjacent State Trust and private lands.

Some of the residual effects of grazing, which include soil compaction, mesquite (shrub) invasion, and trail building by cattle (which increases erosion), would fade over time **on public lands**. Stock tanks and other developments would be removed or abandoned. Livestock would no longer degrade the 3 mi<sup>2</sup> of watershed around the 30+ stock tanks. Fence and water line construction and repair would no

longer be needed and would no longer disturb the watershed. The network of cattle trails that span the 41,855 acres would heal. Vegetation treatments would reverse shrub invasion over much of the area, **although implementing the vegetation treatments could be more difficult.**

Livestock would no longer consume plant biomass that serves as soil cover and forage used by invertebrates, which loosen soil. The result would be increased water infiltration into the soil, increased soil moisture, and decreased runoff and erosion over the long-term.

**There are several scenarios which could occur relating to the State grazing leases held by BLM with differing impacts. BLM could sell the state grazing leases, it could obtain the resources to pursue a commercial permit, or it could apply for conservation use on State Trust lands.**

**If BLM sells the grazing leases, grazing would likely continue on State Trust and private lands, but BLM would no longer be involved in these livestock operations. Livestock management on these nonpublic lands could cause a decline in overall watershed condition, if they were stocked at higher levels to make up for the loss of federal lands for grazing. This decline in overall watershed condition would disturb BLM lands and the riparian and aquatic habitats of Cienega Creek. But BLM would not have input into grazing management on these lands.**

**If grazing continues on intermixed State Trust and private lands, BLM would need to fence the public lands to keep out livestock. If all the public lands, including the many scattered parcels, were fenced to exclude livestock about 110 miles of fencing would be needed. However, by utilizing existing fencing, livestock could be excluded from about 50% of the public lands including most of the riparian areas without the need to develop additional fencing.**

**Other fencing configurations could be utilized to fence out the majority of public lands with about 40-50 miles of fencing.**

**In addition to the required fencing, BLM would have to assume the maintenance responsibility for the new fencing as well as for the existing boundary fencing. BLM's experience in managing the San Pedro Riparian National Conservation Area also shows the need for hiring more staff to detect and resolve unauthorized grazing use on the public lands excluded from grazing, if surrounding lands are grazed. If the State Trust and private lands surrounding the public lands are not being grazed, then these grazing trespass costs would not be incurred. The fencing, fence maintenance and trespass monitoring costs incurred by BLM under Alternative 4 would therefore be variable. However, if BLM or another entity applied for and received conservation use on the State Trust lands (which is now a possibility based on a recent court decision), then the watershed impacts might be different. Improved watershed conditions would occur on both BLM and State Trust lands over the long-term.**

Watershed conditions would be more severely disturbed if private ranches or State Trust Lands are developed **for housing or commercial uses** (See Cumulative Impacts below).

#### **From Special Designations**

##### *Areas of Critical Environmental Concern*

ACEC management under Alternative 4 would affect watershed function and condition the same way as under Alternative 2.

#### **Summary--Alternative 4 on Watershed**

Under Alternative 4, the Cienega Creek watershed would remain stable and functional over the short-term and possibly the long-term. Alternative 4 proposes concentrated activities



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(e.g., roads, rights-of-way, administrative sites, and recreation sites) that could disturb as much as 540 acres of public lands throughout the planning area. This amount represents only 1% of the public lands in the Upper Cienega Creek basin. Dispersed recreation could affect 45,730 acres. Livestock grazing impacts would be eliminated over the long-term on 41,855 acres. Alternative 4 proposes the withdrawal of another 6,730 **7,265** acres, with the potential of being mined, subject to valid existing rights. Such a withdrawal would virtually eliminate the risk of impacts from mineral development.

Of all the alternatives, Alternative 4 most emphasizes maintaining and improving watershed health on the public lands. But these benefits to watershed condition would be offset on State Trust and private lands that revert to traditional livestock grazing that does not emphasize watershed condition. These benefits would be even more offset if State Trust and private lands are sold for development because the loss of public land grazing has caused their grazing operations to lose their economic viability. **However, if conservation use is applied to the State Trust lands or if BLM acquires the lands and removes grazing, then the impacts described for the public lands would also be expected to occur on the State Trust lands.**

Alternative 4 would designate an ACEC to protect the ecological integrity of the entire planning area. By the following actions, BLM would minimize disturbance of soil and vegetation and increase herbaceous soil cover, promoting long-term maintenance and improvement of watershed conditions on public lands and lands acquired within the ACEC:

- Precluding most mining on public lands.
- Eliminating livestock grazing on public lands.
- Designating a single utility corridor in the planning area.

- Applying vegetation treatments.

Road closures would be extensive, limiting runoff and erosion. Camping restrictions under Alternative 4 would be comparatively relaxed, increasing the potential for soil disturbance and the risk of erosion on more acreage than under the other alternatives except Alternative 1.

More than under Alternatives 1, 2, or 3, these provisions under Alternative 4 would help meet the upland vegetation and riparian objectives on the public lands in the short- and long-term, especially when coupled with the following management actions:

- Treating vegetation to increase grass and limit shrubs.
- Restricting riparian camping.
- Not authorizing sand and gravel sales.
- Coordinating watershed management with other entities.
- Correcting excess erosion in Wood Canyon.

#### ***Cumulative Impacts--Alternative 4 on Watershed***

By working as part interest in large ranches in the basin and engaging in mutually agreed upon progressive range management, BLM has been able to be involved in and affect the management of BLM, State Trust, and private lands. BLM's approach has led to flexible stocking rates that have been below the permitted rates. Flexible stocking rates tied to forage production, coupled with range improvements (paid for with grazing receipts) to improve the control of livestock distribution and rotational grazing systems, have improved watershed cover and soil conditions on public and nonpublic lands. If the partnership is lost as BLM drops out as a stakeholder in the

management of large ranches, these ranches might be more likely to resume running at the full permitted limit on State Trust and private lands to make up for the economic loss of public land forage.

Livestock management on these nonpublic lands could degrade overall watershed condition and harm BLM-administered lands, including riparian and aquatic habitats along Cienega Creek. On the Empire-Cienega allotment, the number of head would remain nearly the same to maintain economic viability of the ranch, but the area used would decrease by more than 50% once BLM fences off public lands.

Keeping ranches viable would be complicated by the disjointed pattern of state and private lands in the planning area. With ranching viability affected both by market forces and loss of forage from public lands, sale of land in the basin for development would accelerate. The gains on public lands would likely be offset by a substantial decline in watershed conditions from reverting to traditional grazing practices and converting of private ranches and State Trust Land to urban development. Over the long-term, further development in the basin and increased stocking densities at fixed numbers are expected to greatly increase runoff and erosion and decrease soil cover and water infiltration into the soil.

**However, if BLM or another entity applied for and received conservation use on the State Trust lands (which is now a possibility based on a recent court decision), then the cumulative impacts might be different. Improved watershed cover and soil conditions would occur on both BLM and State Trust lands over the long-term. The risk of development of State Trust lands would still exist and, if these lands were developed, the watershed impacts would include greatly increased runoff and erosion and decreased soil cover and water infiltration into the soil.**

**The implementation of the proposed Las Cienegas Acquisition Strategy (Appendix 2) and the existing Land Tenure Plan Amendment to the Safford District RMP will have the same long-term positive impact as described for Alternative 2.**

### *Impacts to Water Quality*

#### *Impacts on Water Quality from Alternative 1 (Current Management)*

Although water quality sampling of the past nine years has been limited in the Cienega Creek watershed, all samples have met state water quality standards and support all uses designated in the planning area. Therefore, current management would only negligibly lower water quality.

#### **From Desired Resource Conditions**

##### Watershed: Upland, Riparian, and Aquatic Vegetation Management

Current watershed and upland and riparian management would not directly, indirectly, or cumulatively lower water quality.

##### Fish and Wildlife Management

Fish and wildlife management under Alternative 1 would generally raise water quality. Even limited actions to improve habitat for special status species would reduce runoff, erosion, sedimentation, and turbidity, improving water quality but not measurably.

##### Visual Resource Management (VRM)

Visual resource management would not affect water quality.

##### Cultural Resource Management

Actions taken to meet cultural resource objectives would only imperceptibly affect water quality. Restoring historic sites might increase visitation and traffic, worsening road conditions, erosion, and, consequently, water

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quality. Under Alternative 1 upgrading existing visitor restrooms and water facilities at ranch headquarters would improve water quality because site design would incorporate water quality standards for drinking water, waste disposal, and water treatment for sewage. Water quality testing has been insufficient to determine a baseline, but without updates as part of the headquarters development, water quality at headquarters would continue to decline. Upgrading sanitary facilities at headquarters should also reduce impacts elsewhere from dispersed recreation ~~and the increased use of the Arizona Trail.~~

#### **From Land Use Allocations**

##### Mineral Development

The ~~458~~ **7,265** acres that would remain open to mineral development under current management would become a potential source of water quality degradation should mining actually occur. Impacts cannot be projected before preparing a mining plan of operations, which would include methods, mitigation, and rehabilitation plans and plans to meet the required conditions established in aquifer protection permits, Section 404 permits, or other permits for protecting water quality.

##### Utility Rights-of-Way and Land Use Authorizations

Without utility corridor designation, rights-of-way could proliferate, increasing disturbed or exposed surface area, runoff, erosion, and sedimentation in Cienega Creek. Revegetation of disturbed areas would be ~~mitigation~~ required on a case-by-case basis. Negative cumulative impacts of the current management approach to right-of-way and other land use authorizations are likely to exceed those of a designated corridor. An acre of disturbed right-of-way in the Cienega Creek watershed could produce 2 to

3 tons of displaced soil per year. Any action that results in an open-ended increase of disturbed area would have an increasing cumulative effect.

##### Off-Highway Vehicle Management

Under current management, use of unpaved roads is a significant source of turbidity and sedimentation in streams such as Cienega Creek, which receives runoff from the entire planning area. Without any road closures, the continued and probably increasing use of the existing ~~136.4~~ **134.7** miles of roads in the area would continue to lower water quality in Cienega Creek. Although cumulative increases in runoff and sedimentation would be mitigated by the restriction of OHV use to existing roads, increased use of the existing roads and, therefore, an increasing cumulative impact would be expected. Mitigation through increased road and ditch maintenance would be needed.

##### Recreation Management and the Arizona Trail

It is difficult to compare current management with its dispersed recreation use to alternatives that concentrate use. The impact of a single use of an existing trail, or camping area, is likely to be similar anywhere it occurs under comparable conditions. But the overall and cumulative negative impacts in runoff, sedimentation, and bacterial contamination of surface water from dispersed, unrestricted recreation as under current management could be greater than that of concentrated use. Previously undisturbed areas would more likely be disturbed. Erosion on a new, unmaintained trail would probably be greater than on an established, maintained trail. Limiting use in more erodible areas or areas closer to surface water would be more difficult under current management than under the other alternatives.

The current mix of dispersed and concentrated recreation only slightly lowers water quality. But as use increases under current management,

## *Impacts on Water Quality from Alternative 2*

the impacts on water quality from Alternative 1 are likely to increase at a greater rate than that of the other alternatives. Dumping of waste materials now degrades water quality in Empire Gulch.

### *Livestock Grazing*

The current management of grazing would affect water quality much as it would affect watershed, riparian, and aquatic resources.

### ***Empire-Cienega Allotment***

Current management and variable stocking rates, depending on conditions in the Empire-Cienega allotment, have moderately improved water quality. Riparian vegetation has been sustained or improved in condition. Exclosures have provided a high level of protection. And short-term, high intensity use of suitable pastures with annual rest has maintained vegetation cover. Maintaining or improving the condition of riparian and upland pasture vegetation is arguably the most important factor in improving water quality.

On the other hand, the continued use of six existing Cienega Creek livestock crossing lanes would temporarily increase turbidity and coliform bacteria. Livestock crossing the creek might increase sedimentation by trampling banks and disturbing streamside vegetation.

### ***Vera-Earl, Rose Tree, and Empirita Allotments***

The fixed stocking rates in these allotments are conservative. With adequate rest, impacts on water quality would be short-term, and cumulative impacts would be negligible. But not resting areas as planned, perhaps because of drought, could significantly reduce cover and result in runoff, turbidity, sedimentation, and bacterial pollution. Without later adjustments in stocking rates, cumulative harm to water quality would also result.

Not allocating all acres on the Empirita allotment to grazing and not allocating the Empire Mountains to grazing would cumulatively improve water quality in those subwatersheds of Cienega Creek and in Cienega Creek itself as vegetation cover increases.

### **From Special Designations**

#### *Areas of Critical Environmental Concern*

No impacts from current management are expected.

### ***Impacts on Water Quality from Alternative 2***

#### **From Desired Resource Conditions**

#### *Watershed: Upland, Riparian, and Aquatic Vegetation Management*

Vegetation treatments planned for the Empire-Cienega and Empirita allotments are likely to increase surface erosion in the short-term during a period of reduced cover on 20,000 acres identified for treatment through the ecological site inventories. **Additional acreage identified for treatment as a result of monitoring, if treated, would have similar impacts.** If treatments are successful, cover should increase after the first rainy season following treatment. Increased vegetation cover would reduce runoff, erosion, and sedimentation of drainages. Changes in other allotments cannot be predicted since further evaluation will be needed before BLM prescribes any treatments.

The following proposed actions would all immediately and cumulatively raise water quality by reducing sediment entering streams:

- Repairing damaged stream banks.
- Minimizing construction in the 100-year floodplain.
- Prohibiting camping in riparian areas.

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- Limiting stream crossings **by vehicles and livestock.**
- Restricting recreational mining in Cienega Creek.

In many areas, runoff from roads degrades water quality much more than any other agent and causes as much as 90% of degradation on steep slopes. Implementing design changes to halt excess erosion on roads would significantly improve water quality in Cienega Creek and its tributaries to an unknown extent.

##### Fish and Wildlife Management

Fish and wildlife management under Alternative 2 would generally improve water quality. Actions to improve habitat through overall watershed condition improvement would reduce runoff, erosion, sedimentation, and turbidity helping improve water quality.

Actions proposed to reestablish species are likely to have imperceptible or positive impacts on surface water quality. Generally, riparian and aquatic habitat improvement through periodic rest from grazing and vegetation treatments reduces sedimentation and turbidity in surface waters, improving water quality. Also, likely to improve water quality would be actions to improve pronghorn ~~antelope~~ habitat such as low-use primitive camping, limited road use, and acquisition of land and conservation easements.

##### Visual Resource Management (VRM)

Designating visual resource management Class II under Alternative 2 would not affect water quality.

##### Cultural Resource Management

Actions taken to meet cultural resource objectives under Alternative 2 would imperceptibly affect water quality although

restoring historic sites might increase visitation and traffic with associated negative impacts on road condition, erosion, and water quality.

Actions in support of cultural resource objectives would negligibly affect water quality. Monitoring and protecting areas subject to soil erosion and other disturbances that would damage cultural sites are also likely to slightly benefit water quality, depending on site locations.

Managing the Empire Ranch headquarters under Alternative 2 would have the same effects as under Alternative 1, except that adaptive reuse of buildings may attract greater numbers of visitors. Alternative 2 would further develop visitor restrooms and water facilities as visitation increases. Developing sanitary facilities at ranch headquarters would somewhat reduce water quality impacts in other recreation zones and impacts on water quality from increased use of the Arizona Trail.

#### **From Land Use Allocations**

##### Mineral Development

Under Alternative 2, continued closure of most of the public lands to new mining would significantly lower the risk of future water quality degradation from heavy metal contamination that could reach Cienega Creek in runoff. Successful petitions to withdraw land now open to mining would further lower the risk. But these changes would have no immediate measurable impact, positive or negative, because water quality data show no effect from current mineral management.

##### Utility Rights-of-Way and Land Use Authorizations

Alternative 2 would limit impacts to water quality from utility rights-of-way to those now occurring. Any new rights-of-way, if granted, would disturb more surface in the two designated right-of-way corridors.

## *Impacts on Water Quality from Alternative 2*

The degree of impact in increased sediment transport and turbidity is difficult to estimate. Rights-of-way granted on the current pipeline route would increase sedimentation in all tributaries on the west side of Cienega Creek for its entire course in the planning area. Rights-of-way granted on the current power line right-of-way would increase surface disturbance and sedimentation in tributaries on the east side of the northern half of the planning area, especially Mattie Canyon. The impact would diminish as the right-of-way moves farther from Cienega Creek in the south half of the planning area. In either case, Alternative 2 would exclude new disturbance on previously undisturbed land, which would benefit water quality. Seeding, water bars, sediment catchments, and other routine methods of erosion control would significantly mitigate impacts from new surface disturbance.

### Off-Highway Vehicle Management

Designating roads for OHV use would reduce the number of roads on which vehicles would travel. Less motorized travel on roads near drainages would reduce the risk of increased sedimentation, turbidity, and accidental spills of petroleum products in Cienega Creek and its tributaries. But road designation poses the long-term risk of degrading water quality should OHV use and related damage increase to a level that offsets the benefits of designated roads. At that point, when runoff from roads threatens to increase sediment, turbidity, or petroleum-related contamination in Cienega Creek, BLM might need to further restrict access. Such impacts cannot be measured because total traffic would increase to unknown levels as use of the planning area increases over time.

### Access and Transportation

Limiting access to Oak Tree Canyon and its erodible soils would reduce some sedimentation

in nearby drainages. A policy of responding to resource damage caused by transportation should have beneficial cumulative impacts.

### Recreation Management

Recreation zone management under Alternative 2 would affect water quality much as it would affect watershed and riparian areas. These impacts are difficult to project, particularly the cumulative impacts, because they are likely to increase over time at an unknown rate. Even the immediate impacts of concentrating certain types of recreation, groups over 30, car camping, or parking at designated trailhead sites are difficult to assess. Much of that activity is already occurring on those sites. Further concentration of the activity is likely to add slightly to the existing low level of disturbance, with some small increase in runoff and turbidity. These are not likely to be measurable increases.

Reduced ground cover from the group areas at Maternity Well, the Air Strip, and Agricultural Fields is likely to increase sedimentation in streams tributary to Cienega Creek and Empire Gulch. The same affects are likely at the designated camp areas at Oak Tree, Cieneguita, Oil Well, and Road Canyon. Use monitoring and periodically resting these sites could partially mitigate this sedimentation, as could covering the ground with gravel or other materials.

The closeness of heavy use areas to Cienega Creek or its main tributaries increases the risk at Oak Tree and the Agricultural Fields, although it might be some time before heavy use develops at the Agricultural Fields. Silty, erodible soils at Oak Tree further increase the risks of water quality degradation as use grows in that area.

Enforcing the day use restriction at Empire Gulch might reduce the dumping of waste material, particularly organic contaminants, that

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threaten water quality with fecal coliform. BLM has not yet detected violations of water quality standards.

Even where BLM has installed sanitary facilities, the risk of human waste degrading water quality would increase in concentrated use areas and in dispersed hiking and camping areas particularly near Cienega Creek, Empire Gulch, and main tributaries. As use increases, BLM might need to mitigate this problem by patrolling and cleaning up high-use areas.

This assessment assumes that the following management practices and mitigation are also implemented:

- The Leave No Trace program eliminates human waste from designated recreational areas without sanitary facilities.
- BLM educates visitors and enforces the rules on vehicle use and other destructive visitor behavior.
- When damage occurs, it is promptly repaired.

The proposed multi-level maintenance plan is expected to provide the mitigation and facility maintenance to protect or improve water quality.

##### Arizona Trail

Under Alternative 2, most of the Arizona Trail would have to be newly built, causing some transitory increase in sedimentation in Cienega Creek, especially where the trail runs close to the creek. Water quality could also be at risk if runoff in Oak Tree Canyon carries sediment into Cienega Creek.

Predicting levels of future use is difficult. But if use increases significantly, risk of fecal coliform contamination in Cienega Creek would also increase. But degrading of water quality is expected to be negligible and avoidable with simple mitigation. Adequate toilet facilities and

routine trail maintenance would assure that Cienega Creek would continue to meet water quality standards.

##### Livestock Grazing

Under Alternative 2, livestock grazing would affect water quality much as it would watershed. RMP (Resource Management Plan) level planning would slightly reduce acres being grazed in the planning area. A small increase in cover and decrease in runoff, sedimentation, and possibly fecal coliform contamination might result. In Cienega Creek, current levels of turbidity and fecal coliform--the two contaminants attributed to livestock grazing--meet state water quality standards. Therefore, water quality would only slightly improve. Variable stocking rates being used on more of the allotments should respond better to conditions than fixed stocking rates, assuring more cover during drought and improving water quality over time.

##### Empire- Cienega Allotment

Excluding about 2,319 acres from grazing under Alternative 2 might over time reduce runoff and sedimentation in drainages affected by this allotment. The current management strategy would continue on this allotment, not significantly changing water quality.

The use of six **five** existing and two proposed livestock crossing lanes on Cienega Creek and **one on Empire Gulch** would continue to temporarily increase turbidity and coliform bacteria. Livestock crossing the creek **might will** increase sedimentation by trampling banks and disturbing streamside vegetation. **Proposed hardening of lanes, that show erosion or are becoming so boggy that they impede crossing by livestock, with addition of rock in the stream bed and on a portion of the banks, would decrease these impacts.**

### *Impacts on Water Quality from Alternative 3*

#### ***Empirita Allotment***

Although the RMP-level planning under Alternative 2 would allow 300 more acres to be grazed on the Empirita allotment than under Alternative 1, changes in management strategy proposed in the activity plan **livestock management actions** would probably offset any small decrease in water quality. Plans to use a variable stocking rate should result in more cover and less watershed damage during dry periods. Overall, no measurable change in water quality is expected under Alternative 2.

#### ***Rose Tree Allotment***

A 10% reduction in acres being grazed and the implementing of a variable stocking rate might slightly improve water quality. But water quality in the watershed now meets state standards for turbidity and fecal coliform.

#### ***Vera Earl Allotment***

A reduction of nearly 15% in acres being grazed and the implementing of a variable stocking rate might slightly improve water quality, although water quality in the watershed now meets state standards for turbidity and fecal coliform.

#### ***Empire Mountains Allotment***

Livestock grazing in a new 400-acre allotment might increase runoff and sediment and turbidity in the area's drainages. The management plan prepared for this allotment should respond to this possibility with a flexible schedule and stocking rate to protect ground cover, controlling erosion and any threat to water quality from runoff.

The cumulative impacts of livestock grazing management under Alternative 2 are likely to consist of a small reduction of turbidity and fecal coliform in Cienega Creek over time. This improvement in water quality might not be measurable. During dry periods, there is little or no runoff into the creek from the grazing allotments. Current low-flow water quality is good and likely to remain good. During wet

periods when runoff flows, natural levels of turbidity are so high that they would obscure changes due to management under Alternative 2.

#### **From Special Designations**

##### *Areas of Critical Environmental Concern*

Designating all public lands in the planning area as an ACEC under Alternative 2 would not lower water quality. Other limitations, such as prohibiting new mining, would reduce the risk of contaminated runoff and could improve water quality. Prohibiting recreational gold panning in waters of the planning area under ~~implementation plans~~ **management actions** for Alternatives 2, 3, and 4 would significantly reduce the risk of violating turbidity standards. Water quality would improve the most under Alternatives 2 and 4, which would designate the largest ACEC. But the improvement would also apply to Alternative 3, whose ACECs would include all perennial waters, the most likely areas where people would pan for gold.

### ***Impacts on Water Quality from Alternative 3***

#### **From Desired Resource Conditions**

##### *Watershed, Fish and Wildlife, Visual and Cultural Resource Management*

Impacts under Alternative 3 would be the same as under Alternative 2.

#### **From Land Use Allocations**

##### *Mineral Development*

Mineral development under Alternative 3 would lower water quality in the same manner as under Alternative 1. But Alternative 3 would open to mineral development a potentially larger area of public lands outside designated ACECs. Opening areas to mineral extraction would increase the risk of future water quality degradation near perennial water or during high runoff. Nevertheless, implementing Alternative



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3 itself would not measurably lower water quality.

### Utility Rights-of-Way and Land Use Authorizations

Impacts under Alternative 3 would not measurably differ from those under Alternative 2.

### Off-Highway Vehicle Management

Impacts of OHV management on water quality under Alternative 3 would be the same as under Alternative 2.

### Recreation Management

Recreation management under Alternative 3 would directly, indirectly, and cumulatively affect water quality much as it would under Alternative 2. A much larger area in Zone 2 under Alternative 3 could slightly increase concentrated use, increasing runoff and the risk of degrading water quality. Alternative 3 would designate two more group sites, one more camp area and day use area, and three more pullout areas. But more measurable runoff into Cienega Creek or its tributaries with sediment, bacteria, or other contaminants from these sites is unlikely until overall use in the planning area greatly increases. As in the assessment of impacts under Alternative 2, this assessment assumes that BLM will install and maintain sanitary and other facilities and enforce the use rules.

### Arizona Trail

The risks of impacts on water quality from the Arizona Trail under Alternative 3 would be comparable to those of Alternative 2. Levels of use are unlikely to differ. Although the length of the trail in the planning area would be 2.5 miles greater, one mile would be on existing road.

### Livestock Grazing

At the RMP level, the impacts from Alternative 3 would be the same for the Empire-Cienega, Rose Tree, and Vera Earl allotments as under current management. Impacts on the Empirita and Empire Mountains allotments would increase as the result of an increased area of the allotments being open to grazing. The grazed area of public lands on the Empirita allotment would increase about three-fold, and the Empire Mountains, ungrazed under current management, would come entirely under grazing management. Many areas of shallow soils and steep slopes could significantly increase the risk of erosion and limit the opportunity for recovery. Intense storms with high volumes of runoff are common during the summer wet season and are likely to carry sediment directly to Cienega Creek.

~~At the activity plan level,~~ The fixed stocking rate under Alternative 3 would degrade water quality on the Empire-Cienega allotment more than under current management. During unfavorable conditions such as drought, Alternative 3's less flexible management could cause overgrazing and insufficient cover to protect the surface. The result could be sedimentation, increased turbidity, and the exceeding of water quality standards for fecal coliform.

The use of six **five** existing and two proposed livestock crossing lanes on Cienega Creek and **one crossing lane on Empire Gulch** would continue to temporarily increase turbidity and coliform bacteria. Livestock crossing the creek **might will** increase sedimentation by trampling banks and disturbing streamside vegetation. **Proposed hardening of lanes that show erosion or are becoming so boggy as to impede crossing, by addition of rock in the stream bed and on a portion of the banks, would decrease these impacts.**

## *Impacts on Water Quality from Alternative 4*

The activity-level **grazing** management for the Rose Tree, Vera Earl, and Empirita allotments would not significantly differ. Stocking rates would be slightly lower, and vegetation inventories would be updated on the Vera Earl and Rose Tree allotments. But these actions would be unlikely to affect water quality. Livestock would graze the Empire Mountains at a relatively low, fixed stocking rate, which under unfavorable conditions could degrade ground cover. At later dates, runoff into Cienega Creek could lower water quality.

### **From Special Designations**

Areas of Critical Environmental Concern  
ACECs designated under Alternative 3 would improve water quality much as those designated under Alternative 2. The benefits cannot be measured but would be less than under Alternative 2, whose area in ACECs would be ten times greater than that under Alternative 3.

### ***Impacts on Water Quality from Alternative 4***

#### **From Desired Resource Conditions**

Watershed, Fish and Wildlife, Visual and Cultural Resource Management  
Impacts under Alternative 4 would be the same as under Alternative 2.

#### **From Land Use Allocations**

Mineral Development  
Alternative 4 would benefit water quality the same as would Alternative 2.

Utility Rights-of-Way and Land Use Authorizations  
Construction in rights-of-way under Alternative 4 would cause the same disturbance as under Alternative 2 for the existing power line right-of-way on the planning area's east side. Eliminating new disturbance on the pipeline

right-of-way would reduce the risk of increased sedimentation and turbidity in water reaching Cienega Creek from tributaries on the planning area's west side. Eliminating new surface disturbance from construction in rights-of-way anywhere else in the planning area would benefit water quality in the same manner as under Alternative 2.

#### Off-Highway Vehicle Management

Impacts would be the same as under Alternative 2.

#### Recreation Management

Impacts to water quality from recreation under Alternative 4 would be the same as under Alternative 2. A slightly smaller area in Zone 2 management could reduce impacts of concentrated use and associated runoff and increases in turbidity or bacterial contamination in Cienega Creek. Changes are not likely to be measurable.

#### Arizona Trail

Use of the Arizona Trail under Alternative 4 should not degrade water quality as long as Leave No Trace education is effective.

#### Livestock Grazing

Without livestock grazing under Alternative 4, upland cover is likely to increase. Livestock could no longer disturb riparian areas and stream banks. Infiltration of more precipitation and increased density of vegetation in the riparian areas would be likely to improve water quality. Sediment, turbidity, and fecal coliform in perennial water would decline. But water quality would only modestly improve because upland condition is good and water quality is now meeting state standards under current management.

Cessation of grazing within riparian areas would slightly improve the condition of woody and herbaceous vegetation and further increase bank stability. But improvements would only be

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slight because livestock do not graze most of the riparian areas under current management except for crossing lanes and a small winter use area **representing about 2.7% and 8.6% of the total riparian area, respectively.** Any riparian areas not in proper functioning condition have resulted from forces other than grazing. Slight improvements in bank stability and upland condition would reduce sedimentation and turbidity in tributary drainages.

### From Special Designations

#### Areas of Critical Environmental Concern

Designating ACECs under Alternative 4 would benefit water quality in the same manner as under Alternative 2.

## BIOLOGICAL RESOURCES AND PROCESSES

### Impacts to Upland Vegetation

**Scope of Analysis:** This section uses changes in upland vegetation condition and ability to meet the upland vegetation objective to compare impacts of the alternatives on upland vegetation.

#### *Impacts to Upland Vegetation from Alternative 1 (Current Management)*

##### From Desired Resource Conditions

#### Watershed: Upland, Riparian, and Aquatic Vegetation Management

Without an integrated vegetation treatment strategy, Alternative 1 would allow mesquite and burroweed to continue to invade grassland sites as a long-term trend. This invasion would decrease herbaceous vegetation cover on the soil surface and increase deeper rooted woody perennials. If the trend continues, ecological conditions would fail to meet the Arizona Standards for Rangeland Health.

#### Fish and Wildlife and Cultural Resource Management

Fish and wildlife and cultural resource management under Alternative 1 would not affect upland vegetation.

#### Visual Resource Management (VRM)

Implementing visual resource management Class III could constrain vegetation treatments and range improvements.

### From Land Use Allocations

#### Mineral Development

Under current mineral management, mining could directly disturb upland vegetation on ~~6,373~~ **7,265** acres of public and split-estate lands. Moreover, haul roads, material storage sites, and associated facilities and activities would disturb more upland vegetation. These impacts include the following:

- Destroying and removing vegetation.
- Changing plant communities or conditions.
- Introducing exotics plants.
- Promoting weed invasions.

Both short- and long-term impacts could result, depending on the size, type, and duration of the mine. Impacts would be mitigated to the extent possible through BLM mining regulations and the National Environmental Policy Act (NEPA) process.

#### Utility Rights-of-Way and Land Use Authorizations

Many of the land uses authorized under current management (e.g., rights-of-way for access, utilities, vegetation products, and apiaries) require vehicle access roads or work areas that would disturb upland vegetation. The size and nature of the impacts would depend on the

### *Impacts to Upland Vegetation from Alternative 1 (Current Management)*

actions proposed. BLM develops and incorporates into use authorizations the mitigation for protecting and rehabilitating upland vegetation.

#### *Off-Highway Vehicle Management*

Under current off-highway vehicle management, BLM has not fully implemented a designated route system. When vehicles are driven off existing roads and new roads are created, it is difficult to prove that there previously was no road. These “wildcat” roads then become part of the existing road system which keeps expanding. Each new road disturbs more upland vegetation.

#### *Road Designations*

The intermixed land ownership pattern also creates problems. Under current management, BLM can regulate use and maintenance of only portions of the planning area’s road network on BLM-administered lands. This restriction creates great difficulty in implementing changes in the overall road network and in enforcing regulations that could protect upland vegetation. Protecting vegetation and soils in sensitive areas subject to erosion is difficult, if entities share the road ownership. Problems are recognized on a case-by-case basis and the big picture is often missed.

#### *Recreation Management*

Under current management, recreation use has steadily increased on the Empire Ranch since BLM acquired the property. Increased visitation has resulted in increases in campsites, parking areas, turnouts, and trails which have increased vegetation disturbance. Besides trampling more vegetation, expanded recreation has increased unplanned fire starts from vehicles, campfires, cigarettes, and arson. These unplanned fires can harm all resources and remove all vegetation on large portions of the watershed. Unplanned fires can burn when plants are sensitive to damage or in areas susceptible to erosion.

#### *Arizona Trail*

Alternative 1 would not designate a corridor for the Arizona Trail and the trail would, therefore, not affect upland vegetation.

#### *Livestock Grazing*

Under Alternative 1, existing livestock operations would continue at current levels on the public lands as shown in Table 2-6. Livestock would graze a total of 41,855 acres of upland vegetation. On BLM-administered public lands, livestock grazing operations must be able to achieve the Arizona Standards for Rangeland Health and the objectives developed in the interim grazing plans (See Appendix 2). Existing grazing plans have no site-specific interdisciplinary resource objectives for vegetation or wildlife.

Livestock grazing must be able to achieve healthy upland, riparian, and threatened and endangered habitat standards. Under current management, mesquite and burroweed are increasing and perennial grasses are decreasing due to changes in seasonal precipitation, fire suppression, and livestock grazing. Although overall vegetation conditions are improving under current livestock management, mesquite and brush, which are invading in response to past livestock use and fire suppression, might need to be removed through vegetation treatment. Apparent shifts from summer to winter rainfall patterns might also require shrub and tree removal to maintain desired vegetation conditions.

#### *Empire-Cienega Ranch Allotment*

Under current management, intensive, short-term grazing, coupled with annual rest of pastures and flexible stocking rates, is improving vegetation conditions on the watershed. The current grazing strategy seeks to improve plant vigor and herbage production and slowly change the species composition to more desirable perennial grasses (Martin 1978). The time needed and the amount of change expected

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would vary from site to site in the planning area, depending on the site potential of the particular range site (soil type and rainfall zone).

BLM and the livestock operator developed the current livestock grazing strategy with the seasonal growth habits of the key forage species in mind. The rest periods during the spring and summer growing season were designed to physiologically benefit both cool- and warm-season perennial grasses. Continuing this rest through the winter allows the complete phenological development of the grasses before another grazing cycle begins.

Grasses are adapted to grazing pressure because growth originates at the basal meristem, close to the soil surface. Aerial portions are not essential to plant survival and might be regenerated quickly if the root crown is not damaged and if enough photosynthesis has taken place to provide for root development and annual replacement. In fact, moderate grazing might stimulate plant growth because removing plant material with carbohydrate reserves might increase photosynthesis to replace the lost material (Humphrey 1958). Enough residual plant material must be left for soil cover, and the grass' energy reserves must not be depleted through repeated grazing during the growing season.

Fence building would not significantly disturb vegetation. Fence lines would not be bladed, and as little brush as possible would be cut. The impacts would be negligible and short-term.

#### ***Empirita, Rose Tree, and Vera Earl Allotments***

The current stocking rate, combined with annual rest of pastures, should improve upland vegetation conditions. Grazing would be adjusted, if needed, to achieve the Arizona Standards for Rangeland Health.

Impacts from creating any needed range improvements would be similar to those described for the Empire-Cienega allotment. On the Empirita allotment, building the Gary pipeline to replace the creek as a water source would disturb vegetation along the existing roadway for a short period. Future environmental analyses for specific proposals would analyze the nature and degree of impacts from these activities.

#### **From Special Designations**

##### *Areas of Critical Environmental Concern*

Since Alternative 1 would designate no areas of critical environmental concern (ACECs), no special management of upland vegetation would result.

#### ***Impacts to Upland Vegetation from Alternative 2***

#### **From Desired Resource Conditions**

##### *Watershed: Upland, Riparian, and Aquatic Vegetation Management*

Under Alternative 2, upland vegetation management through integrated vegetation treatment would reverse the long-term degradation from grazing and fire suppression that facilitated shrub invasion of grassland ecological sites. BLM would apply prescribed fire, tree and shrub cutting, and herbicide treatments where plant communities have shifted away from dominance by perennial grasses. BLM would also design and implement vegetation treatments to achieve the upland vegetation objective. These treatments would mainly consist of prescribed fire, brush cutting, and the use of herbicides to control mesquite and burroweed. Prescribed fire and herbicides would improve vegetation condition by reducing and slowing the spread of the shrubs in favor of perennial grasses. These treatments would convert 20,000 acres of grassland invaded by mesquite and burroweed to a visual aspect of

open grassland, **and would maintain grasslands and desired vegetation conditions in other areas.** **Requiring permits** **Establishing guidelines including weight limits** for collecting and harvesting vegetation products and plants in the planning area would help prevent unnecessary disturbance to upland vegetation by over collecting.

#### Fish and Wildlife Management

To guide upland vegetation management, BLM must do the following:

- Develop key habitat elements and conditions for the health of special status species.
- Determine desired future vegetation conditions and mosaics of wildlife habitat.
- Resolve conflicting uses.
- Modify vegetation objectives and wildlife sub-objectives to reflect the new information.

These tasks would require an increased commitment to monitoring resources and coordinating with other resource users and specialists. BLM would also need research to determine cause-and-effect relationships. In the Empire-Cienega allotment the biological planning process has served this function well. The pronghorn and sparrow cover objectives in this planning effort directly resulted from the biological planning process.

#### Visual Resource Management (VRM)

Implementing visual resource management (VRM) Class II could more restrict vegetation treatments and range improvements than managing for VRM Class III under current management, which is slightly less restrictive.

#### Cultural Resource Management

BLM would need to evaluate cultural resources for all surface-disturbing activities, including vegetation treatments. BLM might also need to

#### *Impacts to Upland Vegetation from Alternative 2*

develop mitigation to protect cultural resources. Both of these requirements increase the cost of vegetation treatment programs and, therefore, the cost of achieving desired upland vegetation conditions.

Developing the Empire Ranch headquarters would require stripping some vegetation for parking or access, but would result in only slight impacts. Onsite and offsite interpretative and educational programs could help the public understand the grassland ecosystem and how vegetation treatments help sustain that resource.

#### **From Land Use Allocations**

##### Mineral Development

Under Alternative 2, restrictions on mineral development of acquired public lands and the withdrawal of another ~~6,373~~ **7,265** acres of land now open to mineral development would prevent short- and long-term impacts to upland vegetation. Stable vegetation communities would not be at risk from the potential harm of small- or large-scale mining over the short- or long-term. The scope of the impacts would depend on the potential for mitigation and the scale, location, and type of mine.

~~The activity plans for Alternatives 2, 3, and 4 would authorize the administrative and casual use of a limited amount of sand, gravel, boulders, and clay. The vegetation disturbed by the administrative and casual use of these materials would cause localized short-term harm to upland vegetation at the material sites. BLM would incorporate mitigation into the authorization to ensure that as little vegetation as possible is disturbed and to require that the site be rehabilitated after operations cease. Any revegetation would require the use of native plants.~~

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### Utility Rights-of-Way and Land Use Authorizations

Under Alternative 2, more utility development within the two designated utility corridors where lines already exist could potentially disturb upland vegetation. Service roads could disturb more upland vegetation. Vegetation could be disturbed in both the short- and long-term along the route. BLM would use the National Environmental Policy Act (NEPA) to design measures to mitigate long-term adverse impacts.

### Off-Highway Vehicle Management

Alternatives 2, 3, and 4 would restrict vehicle use to designated roads and implement the designated transportation, eliminating the current confusion with wildcat roads. With fewer wildcat roads being created, visitors would disturb less upland vegetation.

### Road Designations

Alternative 2 would retire and rehabilitate ~~±6 13.7~~ miles or ~~23.2~~ **20** acres (~~±2~~ **10**%) of the planning area's ~~199~~ **196**-acre road system. Bare ground would slightly decrease and vegetation would slightly increase.

### Recreation Management

Alternative 2 would establish limits and zones for managing recreational use, growth, and development. The level of impact from recreation on upland vegetation is difficult to estimate. Recreation zones would limit camping-related soil and vegetation disturbance on 4,613 acres. Sites used for group camping or staging areas would be graveled or revegetated to protect watershed integrity. Although reducing the amount of upland vegetation, graveled areas would protect high-use areas and prevent erosion and soil loss from these sites.

The remaining 44,387 acres of public land would continue to be open to dispersed recreation, including camping, hiking, and hunting. These activities would slightly disturb vegetation. BLM would require group events to

have permits with stipulations that would mitigate impacts. Only a few designated group sites would cause watershed damage and these sites would be small. The level of impacts from recreation under Alternative 2 would be somewhat lower than under Alternative 1. Establishing a recreation permit system would allow BLM to adjust recreation levels to ensure that upland objectives continue to be met. Depending on the level of use, recreation under Alternative 2 would slightly to moderately harm upland vegetation.

### Arizona Trail

Trail building under Alternative 2 would disturb about four acres of upland vegetation. But associated camping and wildcat spur trails would disturb more land. Overall, Arizona Trail development under Alternative 2 would disturb slightly more upland vegetation than would Alternative 1, which would not develop the trail.

### Livestock Grazing

Livestock would graze a total of 42,155 acres of upland vegetation under Alternative 2. Livestock grazing management under Alternative 2 would benefit watershed condition and function more than under Alternative 1 as described in the above impacts to watershed section. Under Alternative 2, BLM-administered public lands would need to meet the Arizona Standards for Rangeland Health as detailed for Alternative 1. To make these standards more site specific, the planning team has developed resource objectives that further define BLM's understanding of what healthy conditions would be in the planning area. When implemented, Alternative 2 management would meet these objectives.

BLM would set up more vegetation study exclosures under Alternative 2 (**about** 2,319 acres versus **about** 659 acres under Alternative 1 on the Empire-Cienega allotment) and use them to compare the success of livestock and vegetation treatments in achieving vegetation

objectives and healthy watershed conditions. In response to the data collected and assessed, BLM would adjust livestock grazing strategies, and improved upland vegetation management would result.

Creating a new grazing allotment under Alternative 2 in the Empire Mountains would disturb vegetation much as current livestock grazing does on other public lands. But developing and implementing a livestock grazing operation that includes State Trust and private lands would consolidate land controlled by the grazing lessees, easing the area's overall management. Practices to improve watershed condition (such as prescribed burning), endangered species management, and protection of open space would be much easier to accomplish where all land owners have agreed to the vegetation objectives and ownership does not appear to be as "fractured" as it actually is.

### **From Special Designations**

Areas of Critical Environmental Concern  
ACEC designation would emphasize protecting more lands by acquisition, conservation easements, or partnerships and would allow BLM to coordinate desired future vegetation condition over a larger proportion of the planning area. This designation would also help direct more resources to achieve the upland vegetation objective.

### ***Impacts to Upland Vegetation from Alternative 3***

#### **From Desired Resource Conditions**

Watershed, Fish and Wildlife, Visual and Cultural Resource Management  
Impacts under Alternative 3 would be the same as under Alternative 2.

### ***Impacts to Upland Vegetation from Alternative 3***

#### **From Land Use Allocations**

##### Mineral Development

Under Alternative 3, mineral development would affect upland vegetation as it would under Alternative 1 except that the impacts could occur over a much larger area.

##### Utility Rights-of-Way and Land Use Authorizations

Under Alternative 3, utility rights-of-way and land use authorizations would affect upland vegetation as under Alternative 2. But the impacts could be greater due to the added right-of-way and associated service roads.

##### Off-Highway Vehicle Management

Impacts under Alternative 3 would be the same as under Alternative 2.

##### Road Designations

Alternative 3 would close ~~17.8~~ 14.2 acres of road, mostly in sensitive areas along Cienega Creek. Allowing only one road crossing **across the perennial section of Cienega Creek** and rehabilitating the others would reduce erosion. Watershed function and upland vegetation condition would improve slightly more than under Alternative 1.

##### Recreation Management

Under Alternative 3, the level of impact from recreation on the watershed and on upland vegetation would be less than under Alternatives 1 or 2, because more area would be restricted to designated sites as described in the above impacts to watershed section. Establishing a recreation permit system would allow BLM to adjust recreation levels to ensure that upland objectives continue to be met. As under Alternative 2, adverse affects of recreation on vegetation would be slight to moderate, depending on the level of use.



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### Arizona Trail

The Arizona Trail under Alternative 3 would affect upland vegetation the same as under Alternative 2.

### Livestock Grazing

Livestock would graze ~~43,895~~ **45,375** acres of upland vegetation under Alternative 3. For most years, management on the five allotments would meet the upland vegetation objects as a result of the following:

- Conservative fixed stocking rates.
- Scheduled pasture rotations.
- Annual and seasonal rest of pastures.
- Vegetation treatments such as prescribed fire.

During extended drought the risk of overstocking and overgrazing would increase because livestock management could not change as fast as field conditions might require. Thus, this grazing strategy might degrade vegetation and the watershed if plants lose vigor because of persistent low soil moisture and continued grazing at fixed levels.

Impacts from livestock waters and other improvements under Alternative 3 would be the same as under Alternative 1. This type of grazing management could result in long-term harm to vegetation and watershed condition more than under Alternatives 1 or 2.

### **From Special Designations**

#### Areas of Critical Environmental Concern

Alternative 3 would affect upland vegetation much as would Alternative 1, except that Alternative 3 would reduce the scope of protection by about 90% to cover 4,859 instead

of 45,859 acres. Moreover, opportunities for land acquisition **based on ACEC designation** would be **more** limited under Alternative 3.

### ***Impacts to Upland Vegetation from Alternative 4***

#### **From Desired Resource Conditions**

##### Watershed, Fish and Wildlife, Visual and Cultural Resource Management

Impacts under Alternative 4 would be the same as under Alternative 2.

#### **From Land Use Allocations**

##### Mineral Development

Mineral development under Alternative 4 would affect upland vegetation the same as it would under Alternative 2.

##### Utility Rights-of-Way and Land Use Authorizations

Impacts on upland vegetation under Alternative 4 would be similar to those described for Alternative 2, but would be less harmful because Alternative 4 would limit impacts to one corridor.

##### Off-Highway Vehicle Management

Impacts under Alternative 4 would be the same as under Alternative 2.

##### Road Designations

Under Alternative 4, BLM would close and rehabilitate ~~27.6~~ **25.5** miles of roads or about ~~40~~ **37** acres, including sensitive areas along Cienega Creek. Only one road crossing would remain open **across a perennial portion of Cienega Creek**. The rest would be rehabilitated to reduce erosion. The ~~29.6~~ **31.1** miles of restricted use roads would help prevent wildcat roads in sensitive areas in the watershed and would reduce disturbance of upland vegetation. Adverse impacts under Alternative 4 would be slightly less than under Alternative 1.

## *Impacts to Noxious Weeds from All Alternatives*

### Recreation Management

The level of impact from recreation under Alternative 4 would affect vegetation less than would recreation under Alternative 1. Alternative 4 would set up recreation zones that would limit camping-related vegetation disturbance on 3,270 acres and would periodically revegetate the group camping site. The remaining 45,730 acres of public land in the planning area would remain open to dispersed recreation, including camping, hiking, and hunting. At first, dispersed recreation would disturb only a small amount of vegetation. But the impacts would increase with recreation use over time. As under Alternative 2, establishing a recreation permit system would allow BLM to adjust recreation to ensure that upland vegetation continues to meet its objectives. Depending on the level of use, recreation under Alternative 4 would slightly to moderately harm upland vegetation.

### Arizona Trail

Placing the Arizona Trail along existing roads would eliminate any more disturbance of upland vegetation from trail construction. Some wildcat spur trails would negligibly disturb upland vegetation next to the trail. Consequently, the Arizona Trail under Alternative 4 would affect upland vegetation conditions much as it would under Alternative 1, which proposes no trail.

### Livestock Grazing

Under Alternative 4, BLM would not authorize livestock grazing on any public lands it administers in the planning area. BLM would take 41,855 acres out of livestock production within the four existing allotments. Livestock would no longer consume upland vegetation on these acres, but the following residual effects of grazing would remain at least in the short-term:

- Changes in species composition.
- Increases in invasive species.

- Increases in certain exotic species.

The upland objective would be achieved by applying vegetation treatments and **exotic/invasive species control measures**.

**There are several scenarios which could occur, relating to the State grazing leases held by BLM, with differing impacts.** These impacts would be similar to those described under Alternative 4: livestock grazing impacts to watershed.

### **From Special Designations**

#### Areas of Critical Environmental Concern

ACEC management under Alternative 4 would affect upland vegetation the same as under Alternative 2.

### **Impacts to Noxious Weeds and Invasive Species**

**Scope of Analysis:** This section uses the risk of invasion or spread of noxious weeds **and invasive species** to assess the impacts of the alternatives.

### *Impacts to Noxious Weeds from All Alternatives*

Under all alternatives a variety of human uses of the Empire-Cienega Planning Area could introduce noxious weeds **and introduce or spread invasive species**. Livestock and recreational use would be sources of noxious weeds **and invasive species and can also contribute to the spread of these species**.

Although the current livestock operators do not use supplemental feed for cattle, feed for horses used in livestock operations might not be weed free. As visitors increase, so does the probability of surface disturbance. Such disturbance would increase the likelihood of noxious weeds being introduced to the area.

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Revegetating with native plants following disturbances such as fire, utility line construction, or recreation developments would minimize the spread or introduction of exotic or invasive species from project development.

Under Alternatives 2, 3, and 4, the designation of the public lands in the planning area as a weed management area would provide guidance and resources to combat invasions of noxious weeds **and invasive species**. Reducing miles of road for motor vehicle use would slightly reduce the risk of spreading certain noxious weeds **and invasive species** from the risk under Alternative 1. Implementing integrated vegetation treatment, including prescribed fire, could help control some noxious weeds **and invasive species**, but could spread others such as Lehmann's lovegrass. BLM would consider this possibility in project design and mitigation.

Under Alternative 4, removal of livestock grazing would reduce one risk factor in the introduction and spread of noxious weeds **and invasive species**. Further reduction in miles of roads for motor vehicle use would slightly reduce the risk of spreading certain noxious weeds **and invasive species** from the risk under all other alternatives.

### **Cumulative Impacts--Noxious Weeds**

One of the planning area's goals is to maintain and restore native plant diversity and abundance. Without **proper management** a vegetation management and control program, tamarisk (salt cedar) and other species such as Lehmann's lovegrass can crowd out native species and dominate the landscape. **This would be more likely to occur over the long-term under Alternative 1 (Current Management) where a weed management area is not designated, a vegetation treatment program is not established, and specific actions to monitor and control exotic species where feasible are not prescribed.** Under Alternatives 2, 3 and 4, these

**management prescriptions are made, thereby, increasing the likelihood of elimination or control of noxious weeds and invasive species.** Under all alternatives, residential developments are another **potential** source of noxious weeds **and invasive species**. As the surrounding area continues to grow, the risk of noxious weeds **establishing and invasive species spreading** on the public lands increases.

**Regardless of the alternative, certain invasive species such as Lehmann's lovegrass remain difficult, if not impossible, to eradicate or control once they become established.** Lehmann's lovegrass is already established in the planning area. Over the long-term, unless researchers find new control measures, **Lehmann's lovegrass may continue to spread and replace large areas of native grasses in the planning area.**

### **Impacts to Wetland/Riparian Areas**

**Scope of Analysis:** This section uses changes in riparian condition and function and the ability to meet the riparian objective to compare the impacts of the alternatives on wetland and riparian areas.

### **Impacts to Wetland/Riparian Areas from Alternative 1 (Current Management)**

#### **From Desired Resource Conditions**

##### Watershed: Upland, Riparian, and Aquatic Vegetation Management

Watershed function is an important factor in maintaining stream function (Meehan 1991) and is extremely important to cienegas, which are sensitive to flood disturbance (Hendrickson and Minckley 1984). If the watershed condition and function eventually become degraded, correspondingly, rapid stream adjustments from changes in peak flows and sediment inputs would temporarily degrade riparian resources until the stream attains a new stable state.

### *Impacts to Wetland/Riparian Areas from Alternative 1 (Current Management)*

Increased flood peaks might reduce the extent of cienega habitat. The riparian vegetation objective would not be met until upland watershed conditions are also met by reducing the amount of shrub invasion and increasing the desirable perennial grass component in the vegetation communities.

Under Alternative 1, the lack of vegetation management might result in conditions that prevent Cienega Creek from meeting the riparian objective. Watershed function is an important factor in maintaining stream function (Meehan 1991) and is extremely important to cienegas, which are sensitive to flood disturbance (Hendrickson and Minckley 1984). If the watershed condition and function eventually become degraded from decreased soil stability and decreased cover from shrub invasion then, correspondingly, rapid stream adjustments from changes in peak flows and sediment inputs would temporarily degrade riparian resources until the stream attains a new quasi-stable state. Increased flood peaks are likely to reduce the extent of cienega habitat through incision (Hendrickson and Minckley 1994 1984).

#### *Fish and Wildlife, Visual and Cultural Resource Management*

Under Alternative 1, fish and wildlife management, visual resource management, and cultural resource management would not affect riparian/wetland areas.

#### **From Land Use Allocations**

##### *Mineral Development*

Although the area open to mining under Alternative 1 is a relatively small percentage of the public lands, the riparian objective might not be met if large-scale mineral development occurs on these areas or on surrounding lands in the watershed. Large-scale mineral development could lower water quality and quantity. Water

quality might be lowered by increased sedimentation from large-scale soil disturbance and inadvertent release of toxic materials (Nelson et al. 1991).

Surface water is limited in the Cienega Creek and Babocomari River basins. Extracting water for large-scale mining would reduce aquatic and riparian habitat. Large mines often result in an influx of development to support miners. New water developments for supporting new businesses and residences could reduce groundwater that ultimately feeds Cienega Creek and other riparian habitats. The harm could be negligible to severe depending on the scale, location, and type of mine.

##### *Utility Rights-of-Way and Land Use Authorizations*

Adding new utilities under Alternative 1 would still allow the riparian objective to be met unless utilities proliferate and have a widespread effect on watershed conditions. Increases in sedimentation and runoff from utility corridor development could be substantial. BLM would discourage utilities from crossing riparian zones, but a major utility could greatly degrade these areas. Such degradation could lead to bank instability and sedimentation but would be mitigated because of the high value of the resources, including endangered species.

##### *Off-Highway Vehicle Management*

Limiting off-highway vehicle travel to designated roads under Alternative 1 would protect riparian vegetation and banks from disturbance from cross-country vehicle traffic and should facilitate meeting the riparian objective.

##### *Road Designations*

The 11 fords that cross Cienega Creek are a source of sedimentation to the creek. These crossings provide access to recreation and

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extend the area of disturbance. This source of degradation would slightly harm riparian function under Alternative 1.

##### *Recreation Management*

The lack of designated recreation zones under Alternative 1 would interfere with meeting the riparian objective only if use levels increase dramatically. Recreation is light in the riparian area along Cienega Creek and Mattie Canyon, but is heavy enough in Upper Empire Gulch to create some trails and light bank damage. As recreation increases in the planning area, visitors would create more hiking trails where roads provide access. Water and shade of riparian areas attract people. Bank and floodplain soils are fragile within the planning area's riparian zones. Trails and bank damage are likely to promote erosion and retard riparian development in some areas in the future as visitation to the planning area increases. If bank damage becomes extensive, the stream channel would adjust from bank erosion and sedimentation to become wider and more shallow in profile with fewer deep pools (Rosgen 1996).

##### *Arizona Trail*

Alternative 1 would not designate a trail corridor, but the lack of such a corridor would not affect wetland/riparian areas.

##### *Livestock Grazing*

Watershed function is important in maintaining stream function (Meehan 1991) and is extremely important to cienegas, which are sensitive to flood disturbance (Hendrickson and Minckley 1984). A benefit from the improved watershed condition is the improvement of riparian conditions and later aggrading of the Cienega Creek base level, increasing the capacity of the aquifer in the valley. In the short-term, decreased runoff and improved water retention on uplands are expected to reduce peak flood flows and increase infiltration and aquifer recharge. But without upland vegetation

treatments, over time shrub invasion is likely to offset gains made through advances in grazing practices (See Impacts to **Wetland/Riparian areas from watershed management above**).

The overall impact of continued implementing of current grazing plans under Alternative 1 would be exclusion of livestock and their direct impacts from most of the riparian zone on Cienega Creek, Mattie Canyon, and Empire Gulch on the Empire-Cienega and Empirita allotments. This exclusion would allow plant succession within these riparian areas to progress rapidly toward the potential natural community, either the cottonwood-willow community or the interior marshland complex. The trend is away from a cottonwood-willow plant community toward a marshland (cienega) with a willow component. Increases in vegetation cover, structure, and composition in the riparian zone would improve bank stability and result in a more stable and flood-resistant channel morphology (Hendrickson and Minckley 1984; Platts 1991). Improved riparian function is expected to increase overbank flow, shallow aquifer water capacity, and recharge, increasing the creek's drought resistance and enhancing riparian development.

For about six weeks during the summer, cattle simultaneously graze and use Cinco Ponds as water points. In some years they graze herbaceous vegetation to the waterline and heavily trample banks. Bulrush and other riparian plants regrow after cattle move to another pasture. Sedimentation and accumulation of cattle waste products diminish water quality. Bank damage would likely result in the filling and widening of these ponds, slowly leading to less open water and more coverage by aquatic plants. Grazing of these ponds would directly harm the riparian plant community and the longevity of open water.

## *Impacts to Wetland/Riparian Areas from Alternative 2*

During the short-term, the use of six existing lanes to allow cattle to cross Cienega Creek for pasture rotation would negligibly affect the soils and disturb vegetation and stream banks on up to ~~four~~ **about 8.3** acres of riparian habitat. Cattle would probably use only an individual lane once a year for ~~just over a week~~ **up to 21 days**. While using these lanes, they would trample the soil, decreasing bank stability and increasing the opportunity for localized water erosion from soil disturbance.

Livestock are now grazing along ~~two~~ **1.5** miles of perennial Cienega Creek every other year during the winter (non-growing season) only. **The use area is about 26 acres.** The riparian condition data shows an improving trend and satisfactory condition. Restricting grazing in this area to winter-use is expected to continue in order to promote desirable habitat features such as vigorous plant growth and good bank stability. The livestock operator is currently fencing this reach to exclude livestock **during the growing season** to mitigate any direct impacts.

### **From Special Designations**

#### Areas of Critical Environmental Concern

Alternative 1 would designate no more ACECs with specific management actions to protect sensitive wetland and aquatic areas. The lack of ACEC designation and management prescriptions for these areas would be harmful compared to the other alternatives.

### ***Impacts to Wetland/Riparian Areas from Alternative 2***

#### **From Desired Resource Conditions**

##### Watershed: Upland, Riparian, and Aquatic Vegetation Management

Improved watershed condition under Alternative 2 would benefit wetland and aquatic areas. Treatments to reduce shrubs and increase

perennial grass cover would further reduce sedimentation and the frequency of peak flood flows and increase groundwater recharge, which feeds springs that support the planning area's riparian plant communities.

But prescribed fire might cause localized short-term harm from loss of mature cottonwood, willow, ash, and walnut trees should it temporarily get out of control. Individual burn plans for each year would incorporate mitigation to reduce the risk of damage to riparian areas. The small acreage likely to be burned and the relatively high humidity and fuel moisture would protect most of the trees and other riparian plants closer to the stream channel.

Riparian plant communities of semidesert grasslands have burned periodically (Davis 1994), and this burning has influenced the plant community. Limited accidental burning of riparian zones would likely cause limited short-term harm to these areas.

BLM would design herbicide use for removing invasive or exotic plants to mitigate most potential harm to non-target plants and animals and further analyze potential impacts in site-specific treatment plans.

Upland vegetation treatments that offset the influence of grazing on shrub invasion would lessen the impacts of grazing to the watershed's long-term health, thereby, improving hydrologic relationships and reducing sediment loads.

##### Fish and Wildlife Management

Proposed actions common to Alternatives 2, 3, and 4 for fish and wildlife management would benefit wetland/riparian areas. Securing an instream flow water right would help assure the sustainability of perennial water in Cienega Creek over the long-term, helping maintain the biodiversity in the basin for future generations.

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Restrictions on livestock and recreation use of riparian areas to protect threatened and endangered species would also protect riparian vegetation and stream banks.

Reintroducing beaver would affect channel geometry and riparian expression in several ways. Beaver dams would slow and spread out flood waters onto floodplains where channel widths are expansive. Dams would cause erosion along the perimeter of the new floodplain in incised stream segments created after the drought and flood cycle of the 1890s. This erosion would further widen narrow areas.

Dams are also likely to cause evulsion (the dramatic lateral change in channel location following a flood) of the stream channel onto the floodplain, allowing greater lateral migration of the channel and expanding the surface area of marsh habitat. Beaver activity, particularly new dam building, would follow this evulsion process. This activity would also serve to stabilize and elevate the channel over time by slowing the headward movement of gully erosion and by trapping sediment that fills beaver ponds.

Because Cienega Creek flows through a wide valley basin with floodplains ranging up to a half mile across and with a gentle slope less than 1%, most of the stream can accommodate physical changes caused by beaver dams. Vegetation would respond to tree felling by resprouting from downed limbs and stump bases and in so doing would enhance aquatic habitat diversity. Ground water elevations might rise as the channel as a whole aggrades. Overbank flooding and storm flow retention time is likely to increase bank recharge. Poole (1999) has shown that this type of recharge can be important to the overall water budget in the adjacent San Pedro Basin.

#### *Visual and Cultural Resource Management*

Proposed actions common to Alternatives 2, 3, and 4 for visual and cultural resource management would generally not affect wetland/riparian areas. Public information about wetland/riparian areas at the Empire Ranch headquarters would lead to increased public awareness. This awareness would likely contribute to increased public support for further constraints on activities that are detrimental to riparian/wetland areas in the basin and benefit these areas.

#### **From Land Use Allocations**

#### *Mineral Development*

By eliminating the potential for mining on public lands, Alternative 2 would greatly reduce the risk of impacts of mines (riparian habitat degradation from sedimentation, excessive water use, and contamination), which are described for Alternative 1. Some of these impacts could still occur if large-scale mines are developed on surrounding lands.

#### *Utility Rights-of-Way and Land Use Authorizations*

Designating utility corridors away from riparian areas under Alternative 2 would eliminate the risk of new utilities directly affecting these areas, as might occur under Alternative 1. The single "aerial" crossing of the existing corridor **little minimally** affects the riparian area. Future utilities using this corridor would likely apply the same mitigation. Restricting service roads to upland areas would prevent direct harm to riparian areas.

#### *Off-Highway Vehicle Management*

Off-highway vehicle management under Alternative 2 would affect riparian areas the same as under Alternative 1.

Road Designations

Only one of the 11 road crossings through wetland/riparian areas would remain under Alternative 2. Retiring and rehabilitating these road crossings on the floodplain would alleviate the bank erosion and sedimentation that would occur under Alternative 1.

Recreation Management

Foot and horse traffic along Cienega Creek would increase as the planning area becomes better known to the public. Erosion is likely to greatly increase if hikers and horseback riders create trails on the fragile soils along the banks or floodplain of Cienega Creek. Alternative 2 would better protect the riparian area along Cienega Creek than would Alternative 1. Recreation is likely to be slightly to moderately harmful to riparian areas. Establishing a recreation permit system would help ensure that use levels help maintain riparian function and condition.

Arizona Trail

Under Alternative 2, the Arizona Trail would not be located close enough to the riparian area to have a direct impact. But extra visitation by hikers might slightly degrade bank stability and vegetation. Hikers wanting access to the riparian area are likely over time to create small wildcat spur trails.

Livestock Grazing

Management of livestock grazing under Alternative 2 is likely to benefit riparian areas more than under Alternative 1, because of the improvement in watershed conditions as a result of vegetation treatments, including prescribed fire, coupled with variable stocking rates and flexible rotation systems determined by resource conditions through biological planning. Livestock exclosures on Cienega Creek below the Narrows and at Nogales and Little Nogales Springs would ensure that the vegetation would reach its potential natural state in the least amount of time and with fewest setbacks from

livestock management problems.

During the short-term, the use of ~~six~~ **five** existing ~~and two proposed~~ lanes on Cienega Creek **and one new lane on Empire Gulch** to allow cattle to cross Cienega Creek **and Empire Gulch** for pasture rotation would ~~negligibly~~ **negatively** affect the soils and disturb vegetation and stream banks on up to ~~five~~ **8.3** acres of riparian habitat, ~~slightly more than~~ **about the same as under** Alternative 1. Cattle may use an individual lane for up to three weeks, usually every other year. While using these lanes, they would trample the soil, decreasing bank stability and increasing the opportunity for localized water erosion from soil disturbance. **Hardening of lanes that show erosion or are becoming so boggy as to impede crossing by livestock, with rock would lessen these impacts.** Construction of an upland water in the 49 Wash confluence area which would result in conversion of A&B pastures to a lane would lessen impacts to wetland/riparian areas even further.

**Winter use of the Narrows riparian pasture and winter-spring use of A & B pastures by livestock along about 1.5 miles of creek (26 acres of riparian) would result in some trampling of riparian vegetation and banks along about 8.6% of the total riparian area. The result could be a decrease in bank stability and some loss of riparian vegetation along nearly two miles of the riparian area. Construction of an upland water in the area of the 49 Wash confluence with Cienega Creek would result in conversion of A & B pastures to a lane would be beneficial to wetland and riparian areas by further reducing livestock impacts along one-half mile of riparian area.**

**Under Alternative 2, livestock use of Cinco ponds and other wetland areas in the floodplain of Cienega Creek would be modified to ensure that these areas are in proper functioning condition and in accord with threatened and endangered species management needs.**



Initially, one or more of Cinco ponds would be excluded from livestock use. The resulting ecological changes would be studied to determine the best management practices for balancing both desired ecological condition and special status species needs.

Public lands in the Rose Tree Ranch, Vera Earl Ranch, and Empire Mountains would benefit from the more intensive management and collaboration under Alternative 2, including completion of ecological site inventories and monitoring. Improvements in watershed condition on all allotments should indirectly benefit riparian and wetland areas.

Implementing the biological planning process on all allotments should help recognize and resolve resource conflicts and also indirectly benefit these areas.

#### **From Special Designations**

##### Areas of Critical Environmental Concern

ACEC designation under Alternative 2 would emphasize agency conservation of watershed health and processes that benefit riparian and stream conditions. This designation would direct more agency resources to conserving the planning area's riparian resources and benefit riparian/wetland areas.

##### ***Cumulative Impacts--Alternative 2 on Wetland/Riparian Areas***

Upstream improvement in watershed conditions might benefit downstream segments of Cienega Creek into Tucson through indirect and cumulative benefits such as reduced flood peak discharge, attenuating flood discharge, and increased base discharge (Hendrickson and Minckley 1984).

The implementation of the proposed Las Cienegas Acquisition Strategy (Appendix 2) will preserve watershed condition of the NCA resulting in long-term positive impact to wetland

and riparian areas. Developments of private and State Trust Lands is a near certainty if the human population in southern Arizona continues to grow. Large scale development can change runoff and sediment relationships resulting in the destabilization of stream channels (Dunne and Leopold 1978). This destabilization can result in the rapid erosion of perennial, and intermittent stream channels that support wetland/riparian plant communities. Past watershed disturbances have resulted in deep down cutting and subsequent draining of aquifers that feed these areas composed of fragile soils (Hendrickson and Minckley 1984).

#### ***Impacts to Wetland/Riparian Areas from Alternative 3***

##### **From Desired Resource Conditions**

##### Watershed, Fish and Wildlife, Visual and Cultural Resource Management

Impacts under Alternative 3 would be the same as under Alternative 2.

##### **From Land Use Allocations**

##### Mineral Development

Mineral development under Alternative 3 could affect riparian areas more than under Alternative 1, because areas open to mineral development would be more extensive and have a greater potential for more large-scale mineral development. But Alternative 3 would protect Cienega Creek, Lower Empire Gulch, Cinco Ponds, Mattie Canyon, and Nogales and Little Nogales Springs from direct impacts of mineral entry and surface disturbance.

##### Utility Rights-of-Way and Land Use Authorizations

Utility rights-of-way and land use authorizations under Alternative 3 would affect riparian areas the same as under Alternative 2.

## *Impacts to Wetland/Riparian Areas from Alternative 3*

### Off-Highway Vehicle Management

Off-highway vehicle management under Alternative 3 would affect riparian areas the same as under Alternative 1.

### Road Designations

Road closures and restrictions under Alternative 3 would affect riparian areas much as they would under Alternative 2, except that Alternative 3 would close and rehabilitate a smaller acreage of roads.

### Recreation Management

Under Alternative 3 recreation would affect riparian areas the same as under Alternative 2.

### Arizona Trail

Under Alternative 3, the Arizona Trail would follow the riparian area through the Narrows and pass over fragile floodplain soils. Later, flooding might start erosion causing the trail to down cut. Down cutting might create secondary channels that would disturb stream function. Hikers leaving the trail might to some degree disturb bank stability and vegetation, depending on the level of use. If the trail passes over the floodplain, channel adjustments would directly harm riparian resources and channel function. The impacts would be greater than under the route proposed by Alternative 2.

### Livestock Grazing

Livestock grazing management under Alternative 3 might impair watershed condition during drought. Because watershed function is integral to riparian function through effects on the hydrologic response to watershed conditions, livestock grazing could harm riparian area condition and stream channel function. Reductions in watershed cover might increase runoff, flood peaks, and sedimentation, and decrease aquifer recharge and base flows (Dunne and Leopold 1995; Thurow 1991). Because few livestock would graze in riparian areas, vegetation is likely to buffer the channel

against erosion and somewhat filter excess sediments.

Livestock ~~would continue to use of Cinco Ponds, and degrade the area much as they would under Alternative 1~~ **under Alternative 3, would have a greater degree of negative impact than under Alternative 2.** Impacts from crossing lanes, livestock waters, and other improvements under Alternative 3 would be the same as under Alternative 2. Overall, grazing management under Alternative 3 would degrade riparian condition and function more than under Alternatives 1 or 2 **primarily due to reduced conditions of upland areas from fixed numbers of livestock grazing during drought periods when numbers exceed the current carrying capacity of the vegetation. This is likely to increase runoff and sediment rates causing some level of stream channel adjustment to Cienega Creek and its tributaries.**

## **From Special Designations**

### Areas of Critical Environmental Concern

Alternative 3 would reduce the area within ACECs by about 90% compared to Alternative 2. Nevertheless, ACECs would still cover most riparian areas and valley bottoms including: Cienega Creek, Cinco Ponds, Lower Empire Gulch, Mattie Canyon, and Nogales and Little Nogales Springs. Upper Empire Gulch would not be protected by ACEC designation and management emphasis to maintain ecological integrity. The impact of ACEC management to riparian areas under Alternative 3 would be more beneficial than under Alternative 1, which would designate no more ACECs.

## ***Cumulative Impacts—Alternative 3 on Wetland/Riparian Areas***

Cumulative impacts under Alternative 3 would be the same as under Alternative 2.

**Impacts to Wetland/Riparian Areas from Alternative 4**

**From Desired Resource Conditions**

Watershed, Fish and Wildlife, Visual and Cultural Resource Management

Impacts under Alternative 4 would be the same as under Alternative 2.

**From Land Use Allocations**

Mineral Development

Under Alternative 4, mineral development would affect riparian areas the same as under Alternative 2.

Utility Rights-of-Way and Land Use Authorizations

Utility rights-of-way and land use authorizations under Alternative 4 would affect riparian areas the same as under Alternative 2.

Off-Highway Vehicle Management

Off-highway vehicle management under Alternative 4 would affect riparian areas the same as under Alternative 1.

Road Designations

Road closures and restrictions under Alternative 4 would affect riparian areas the same as under Alternative 2.

Recreation Management

Under Alternative 4, recreation would affect riparian areas the same as under Alternative 2.

Arizona Trail

The Arizona Trail under Alternative 4 would affect riparian areas the same as under Alternative 2. The impacts of a minor increase in disturbed land in the watershed, resulting from the creation of a new trail under Alternative 2, would be negligible and comparable to impacts from restricting the trail to shared use on existing roads under Alternative 4.

Livestock Grazing

Grazing management under Alternative 4 would benefit riparian resources. Eliminating livestock grazing on public lands under Alternative 4 would affect riparian areas in much the same way as under Alternatives 1, 2, and 3, since these alternatives would virtually eliminate direct cattle impacts to riparian areas. The difference is that Alternative 4 would eliminate existing crossing lanes **and watering areas**, which would further improve riparian condition in **1,800 linear feet about 1.5 miles** of riparian area (**four 34** acres) along Cienega Creek. In addition, Cinco Ponds would remain undisturbed by heavy grazing and bank trampling. Alternative 4 would also benefit watershed condition and function by eliminating impacts from livestock and range improvements in the uplands on public lands and might indirectly benefit the riparian system. An improvement of some degree in watershed function is expected to result in the following benefits to riparian resources:

- Decreased peak flows.
- Decreased sedimentation.
- Increased infiltration and aquifer recharge.
- Increased duration and length of perennial flow.

But the failure of the management of the State Trust and private lands next to the BLM properties to provide desirable vegetation and soil relationships could degrade sensitive riparian and aquatic habitats on the public lands to unacceptable levels (See **Impacts to Wetland/Riparian Areas from watershed management under Alternative 2** above-watershed section).

### **From Special Designations**

#### Areas of Critical Environmental Concern

Under Alternative 4, ACEC management would affect riparian areas the same as under Alternative 2.

#### ***Cumulative Impacts—Alternative 4 on Wetland/Riparian Areas***

Under Alternative 4, watershed function would improve on 41,855 acres of BLM-managed land or 29% of the Upper Cienega Creek watershed. This is not expected to be the case on adjacent State Trust and private lands (See Impacts to Watershed section above). Upstream improvement in watershed conditions on public lands might be overshadowed by degradation elsewhere in the watershed. Such changes are likely to result in the following:

- Increased peak discharges during floods.
- Increased sedimentation.
- Decreased recharge.
- Increased water withdrawals resulting in decreased base discharge. All of these changes are likely to culminate in indirect, cumulative long-term harm to cienega-type wetlands (Hendrickson and Minckley 1984).

**The implementation of the proposed Las Cienegas Acquisition Strategy (Appendix 2) has the potential to off-set much of the negative impacts to watershed function that lead to wetland degradation. However the acquisition area is likely too small to prevent the influences of future high density development in the area which is likely to occur if southern Arizona's human population continues to grow. The water consumption in the basin as the population increases will likely have a negative impact on base flows in Cienega Creek and other wetland areas. This will likely occur through incremental reductions in discharge as more ground water is**

**intercepted from these areas through ground water withdrawals to support additional housing and industrial development.**

### **Impacts to Fish and Aquatic Wildlife**

**Scope of Analysis:** This section uses changes in habitat features and populations of fish and aquatic wildlife to compare the impacts of the alternatives on fish and aquatic wildlife.

#### ***Impacts to Fish and Aquatic Wildlife from Alternative 1 (Current Management)***

### **From Desired Resource Conditions**

#### Watershed: Upland, Riparian, and Aquatic Vegetation Management

Under Alternative 1, the lack of integrated vegetation management might create conditions that prevent Cienega Creek from meeting the aquatic portion of the riparian objective over the long-term and would harm federally listed aquatic wildlife and plants. Watershed function is important in maintaining stream function (Meehan 1991) and is extremely important to cienegas, which are sensitive to flood disturbance (Hendrickson and Minckley 1984). Under Alternative 1, habitat changes including loss of pools from sedimentation and loss of cover from channel adjustments would degrade aquatic habitat important to federally listed and other wildlife (See **Alternative 1: Impacts to Watershed** section).

#### Fish and Wildlife Management

Under all alternatives, BLM would consult with the U.S. Fish and Wildlife Service on all projects that might affect any listed species or critical habitat. This consultation would ensure that activities in aquatic environments are fully mitigated and their adverse impacts on endangered or threatened species are minimized. The range of the Gila topminnow would be extended to improve the status of the Cienega

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Creek lineage. Improvements in the status of endangered species would reduce the likelihood of extinction and might eventually lead to the recovery of the species to the point that it no longer needs to be listed.

Visual Resource Management (VRM)  
Management as VRM Class III under Alternative 1 is not expected to affect aquatic habitat conditions and wildlife.

Cultural Resource Management  
Cultural resource management under Alternative 1 would not affect fish and aquatic wildlife.

### **From Land Use Allocations**

Mineral Development  
The aquatic habitat portion of the riparian objective might not be met if mining becomes extensive in the planning area. Large-scale mineral development can affect both water quality and quantity. Surface water is limited in the Cienega Creek and Babocomari River basins. Extraction of water for large-scale mining would reduce aquatic habitat for native fishes, leopard frogs, Mexican garter snakes, and a host of migrating or nesting neotropical birds. Listed or soon to be listed under the Endangered Species Act of 1973 are the following species that could be affected by mineral development:

- Southwestern willow flycatcher
- Gila topminnow
- Huachuca water umbel
- Gila chub
- Yellow-billed cuckoo
- Chiricahua leopard frog

Large mines often result in an influx of development close to the mine to support workers. New water developments used to support new businesses and residences could lower the ground water that ultimately feeds

Cienega Creek and other aquatic habitats (Naeser and St. John 1996).

In addition, an increase in the population next to the planning area would likely increase pressure for sport fishing. This pressure could lead to an increased incidence of illegal fish introductions for sport fishing and could devastate native fish communities (Minckley and Deacon 1991). The harm to aquatic habitat and wildlife species could be negligible to severe depending on a variety of factors including: the scale, location, type of mine, location of resident miners, and potential for mitigation.

### Utility Rights-of-Way and Land Use Authorizations

Adding new utility lines would not interfere with BLM's meeting the aquatic habitat portion of the riparian objective unless the lines expand and have a widespread effect on watershed conditions or encourage increased urbanization in the basin. Utility corridor development could substantially increase sedimentation and runoff under Alternative 1. BLM would discourage utilities from crossing riparian zones, but a major utility could substantially degrade these areas and cause bank instability and sedimentation. Alternative 1 would discourage utilities from crossing the riparian zone, but utilities might still cross riparian and aquatic habitat. Heavy construction equipment and disturbance might slightly to moderately disturb habitats important to federally listed and other fish and aquatic wildlife.

Other infrastructure, such as utility lines, would facilitate or encourage the development of the basin which includes thousands of acres of State Trust and private lands. Such development would likely alter hydrologic function (Dunne and Leopold 1995; Naeser and St. John 1996). Cienegas in the basin are fragile wetlands that would likely be disturbed greatly by such changes (Hendrickson and Minckley 1984). Degradation from the corridor itself would be

*Impacts to Fish and Aquatic Wildlife from Alternative 1 (Current Management)*

mitigated to the extent possible because of the high value of the resources, including endangered species.

Off-Highway Vehicle Management

Under Alternative 1, limiting off-highway vehicle (OHV) travel to designated roads should help meet the aquatic portion of the riparian objective. This restriction would protect the following:

- Aquatic wildlife from harassment.
- Habitat conditions, especially stream banks, from OHV degradation.
- Habitats important to federally listed and other aquatic wildlife

Road Designations

Under Alternative 1, motor vehicles use 136.7 **134.7** miles of roads (public and administrative use) under partial implementation of the designated road system. Restricting vehicles to these roads helps meet the aquatic habitat objective. The 11 fords that cross Cienega Creek are a minor source of sedimentation to the creek. But they are eroding at increasing rates, adding to sedimentation caused by widespread soil piping on abandoned floodplains along Cienega Creek and Mattie Canyon. These crossings provide access for recreation, extend the area of disturbance, and allow ample opportunity for the illegal transport of nonnative fish. The potential impact of these crossings ranges from small adverse impacts from sedimentation and fish injury to the large adverse impact of facilitating the introducing of illegal sport fish.

Recreation Management

Although recreation zones are not established under Alternative 1, the aquatic portion of the riparian objective would be met unless recreation use levels rise dramatically. Alternative 1 would degrade stream banks to a

limited extent as recreation increases in riparian areas.

Recreation is light in the riparian area along Cienega Creek and Mattie Canyon, but is heavy enough in Upper Empire Gulch to create some trails and light bank damage. As recreation increases in the planning area, visitors would create more hiking trails where roads provide access to riparian areas. The water and shade of riparian areas attract people. Bank and floodplains soils are fragile within the planning area's riparian zones (See BLM 1987c). Trails and bank damage from increasing visitor use are likely to promote erosion and retard the growth of riparian plants on stream banks. This damage would disturb habitat features for fish and aquatic wildlife species in some of the more popular areas. If bank damage becomes extensive, the stream channel would adjust from bank erosion and sedimentation to become wider and more shallow in profile with fewer deep pools (**as described in the Alternative 1 Impacts to Wetland/Riparian Areas Recreation Management section above**).

The presence of large-pool habitat and the potential for fishing could encourage the illegal stocking of Cienega Creek with sport fish. But the Arizona Game and Fish Commission's closing of Cienega Creek to fishing has diminished this risk. Proper signing of the area would further diminish this risk. Thick vegetation and the muddiness of the creek limit foot traffic across the creek. Trampling along the creek's shallow margins is likely to subject Gila topminnow to a small level of mortality. These risks would become more serious as the area either becomes more popular or as the basin is developed for residential communities, which is the long-term trend (Naeser and St. John 1996).

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### Arizona Trail

The lack of a designated route for the Arizona Trail under Alternative 1 would not affect fish and aquatic wildlife.

### Livestock Grazing

Under Alternative 1, current livestock management, with limited use of aquatic habitat and the riparian zone by livestock, is increasing the habitat elements important to fish. These elements include: woody cover, undercut banks, average pool depth, and overhanging cover.

For about six weeks during the summer, cattle simultaneously graze and use Cinco Ponds as water points. Cinco Ponds support native leopard frogs, breeding ducks, and rails. Heavy grazing during the summer subjects frogs and tadpoles to decreased cover and water quality. Heavy grazing and bank trampling reduce the quality and quantity of habitats for frogs, ducks, and rails. Sedimentation and accumulation of cattle waste products diminish water quality.

Other impacts to these ponds from grazing can be both harmful and beneficial. On the one hand, bank damage would likely result in the filling and widening of these ponds, slowly leading to less open water and more coverage by aquatic plants and speeding their natural progression to wet meadows. This thick vegetation is ideal cover for rails and many other bird species. But grazing of these ponds would directly harm aquatic habitats by reducing the longevity of open water needed to support leopard frogs, ducks, and future fish introductions.

On the other hand, by cropping off large volumes of aquatic plants, grazing can reduce the biomass of plant material deposited annually. This reduction in biomass also opens up some of the ponds that would otherwise have a complete stand of emergent vegetation and provides open water for ducks, fish, and frogs.

**The reduction in plant material also attracts**

**bullfrogs which have recently populated these ponds. Remedies to bullfrog establishment include special fencing and removal. Ridding an area of bullfrogs even with these treatments have been shown to be problematic throughout southern Arizona.**

Livestock use of six existing crossing lanes on Cienega Creek would harm fish and fish habitat, directly affecting 1,800 linear feet (0.4 acres) of aquatic habitat. Large numbers of cattle crossing the creek are likely to injure small numbers of topminnow and other fish, frogs, and garter snakes. But, overall, harm to fish, frog, snake, and flycatcher populations is expected to be minor.

Indirect effects of livestock using these crossings would include trampling of the soil and the resulting decreased bank stability and lowering of water quality. This impact in turn increases the opportunity for localized water erosion from soil disturbance, which degrades fish habitat by covering food organisms with silt. The intermittent use of these lanes for cattle to cross the creek for pasture rotation in the short term would degrade the 0.4 acres **of aquatic habitat** involved.

Livestock are also grazing ~~two~~ about **1.5** miles of perennial Cienega Creek every other year; **about 0.5 miles** during the winter (non-growing season) only **and about one mile during winter and spring**. Riparian condition data show an improving trend and satisfactory condition. Winter-use is expected to continue until the reach is fenced to exclude livestock from the riparian area to mitigate most direct impacts of the grazing operation on federally listed fish.

Although fish populations might experience limited short-term harm from the existing livestock grazing plan, livestock grazing is not compromising the overall health of topminnow and Gila chub populations. Species such as the

*Impacts to Fish and Aquatic Wildlife from Alternative 1 (Current Management)*

Southwestern willow flycatcher, Mexican garter snake, and Chiricahua leopard frog are likely benefitting from increased vegetation density in aquatic habitats under the present grazing regime.

The diminutive Huachuca water umbel, on the other hand, might not be as likely to survive where other aquatic and semiaquatic plants limit exposed soil, light, and nutrients. Likewise, longfin dace would likely become less abundant with the continued loss of open, wide, shallow, sandy habitats to those of well-vegetated marsh or deeper, narrower pool habitats. Cattle do attract and support cowbirds, which lay parasitic eggs in the nests of Southwestern willow flycatchers and other riparian nesting birds (See Impacts to Terrestrial Wildlife section below). This attraction can be considered an adverse impact.

Stock ponds provide an opportunity for the illegal stocking of sport fish and refuges for dispersing bull frogs. These alien fish and frogs threaten native fish and frogs. To mitigate the probability of contaminating stock waters by the public's illegal transplanting of nonnative fishes, these water sources would be supplied with water on a seasonal basis only and would be allowed to dry annually. These "repressos" would dry up naturally in one to three months after pumping stops.

Only a few stock waters catch rain runoff that allows for extended persistence. Of these, none have perennial surface water. The risk to the fish community in Cienega Creek from developing these waters is small. This aspect of the grazing plan is not likely to harm Gila topminnow, longfin dace, or Gila chub.

***Empirita Allotment***

The present proposal to exclude grazing at the Narrows on Cienega Creek would provide a high level of protection for Gila topminnow habitat. No catchments that might attract sport

fish or bull frogs that could contaminate aquatic habitat with native species are planned for or operated on public land in this allotment.

***Vera Earl and Rose Tree Allotments***

No catchments that might attract sport fish or bull frogs that could contaminate topminnow sites are planned for or operated on public land in these allotments, and no perennial stream segments are present. Therefore, livestock grazing under Alternative 1 on these allotments would not affect fish and aquatic wildlife.

**From Special Designations**

*Areas of Critical Environmental Concern*

Lack of designation of ACECs in sensitive riparian areas could deny important protective management to fish and aquatic wildlife (See the impacts to **as described in the Alternative 1: Impacts to Wetland/Riparian Areas from ACEC management above**).

***Summary--Alternative 1 on Fish and Aquatic Wildlife***

Alternative 1 could meet the aquatic portion of the riparian objective in the short- and long-term with few long- or short-term negative impacts. As a result, a host of aquatic wildlife species, plants, and rare aquatic habitat types would benefit. BLM would restrict off-highway vehicles and livestock grazing to the point where impacts on aquatic habitat and populations of federally listed fish, frogs, and plants would be limited to the following:

- Cinco Ponds
- ~~± 1.5~~ miles of Cienega Creek (until fenced in 2001 **replacement upland waters developed**)
- 1,800 feet of creek within crossing lanes
- Nogales and Little Nogales Springs

Another 1,700 feet of Cienega Creek would be



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fenced to exclude livestock from the riparian area at the most northerly stream reach.

If use levels greatly increase, recreation could create enough damage to cause widespread and long-term disturbance to stream banks and vegetation, which form the structure of aquatic habitat. Increased recreation and urbanization in the basin could lead to the illegal stocking of Cienega Creek and other waters with nonnative fishes, bull frogs, or crayfish, which would permanently devastate populations of native aquatic animals.

Ultimately, changes in watershed conditions from shrub invasion (as a result of full fire suppression), widespread residential development, or large-scale mining could change aquifer elevations, duration of surface flows, sedimentation, and flood flows. The result would be bank erosion and undesirable changes in riparian and aquatic habitat, which would permanently harm wildlife populations that rely on Cienega Creek and other sensitive aquatic habitat types.

### ***Impacts to Fish and Aquatic Wildlife from Alternative 2***

#### **From Desired Resource Conditions**

##### *Watershed: Upland, Riparian, and Aquatic Vegetation Management*

Implementing a vegetation treatment program would create conditions that help Cienega Creek meet and maintain the aquatic portion of the riparian objective, thereby benefitting federally listed fish and aquatic wildlife and plants. Upland vegetation management would enhance riparian development and channel stability by reducing the prevalence of shrubs. Such management would also increase watershed cover by promoting increased perennial grasses. The fish and aquatic wildlife and plants in Cienega Creek would benefit from a low level of sediment supply that promotes channel

stability. Lower sedimentation and higher channel stability would promote habitat development with a diversity of conditions, including the following:

- High levels of instream cover.
- A large range of depths and velocities.
- Riparian canopy cover that lessens seasonal extremes in water temperatures.

Controlled burning might lower water quality for fish and frogs for short periods over limited distances of stream habitat. Precautions such as small burn unit size and sequencing of burn plots over individual sub-basins would make the influx of ash to Cienega Creek unlikely to reach concentrations that would kill fish and wildlife. The influx of sediments from burned areas is not expected to reach levels that would alter aquatic habitat composition and characteristics except when close to the tributary carrying the sediment.

Fire reaching the riparian area might cause a temporary loss over a limited area of cover used by waterfowl such as ducks, snipes, and rails. Fire might also destroy garter snakes, mud turtles, young birds, and eggs. But prescribed fire is likely to inflict only minor harm to wildlife populations and habitat in riparian/aquatic areas.

BLM would design herbicide use to mitigate most potentially harmful impacts to nontarget plants and animals and would further analyze potential impacts in site-specific treatment plans.

##### *Fish and Wildlife Management*

Unlike current management, the fish and wildlife management actions common to ~~activity plans for~~ Alternatives 2, 3, and 4 would enhance the ability to restore natural diversity of fish and wildlife. These actions would more emphasize

protecting habitat for sensitive aquatic species than would Alternative 1.

Reintroductions or range extensions would conserve aquatic wildlife, including the desert pupfish, Gila topminnow, Gila chub, lowland leopard frog, and Chiricahua leopard frog and improve their chances for long-term survival. If their situation (i.e. security from extinction) improves, candidate species for listing might not need to be listed or listed species might be down listed.

Securing instream flow water rights would ensure sustainability of surface water in Cienega Creek essential to maintaining habitats and populations of fish and aquatic wildlife. Such animals include: Gila topminnow, Gila chub, longfin dace, leopard frog, and Mexican garter snake.

Reintroducing beaver would affect channel geometry and riparian expression in several ways as described for riparian/wetland areas. The result would be enhanced aquatic habitat diversity through increased velocity and depth diversity, especially in dammed back waters. Areas of increased stream temperatures, particularly on stream margins, are likely to improve rearing habitat for young cyprinid minnows and topminnows. Gains in stream temperature will be partially moderated by shading from riparian tree canopy cover.

**Controlling alien species like the introduced bullfrog would improve the ability of native species remain in wetlands in the NCA resulting in a positive impact for leopard frogs, Mexican garter snake and Sonoran mud turtle. In General, this is true of other alien species that may arrive in the future that compete, displace or prey upon native species.**

Visual Resource Management (VRM)

Visual resource management classes under Alternative 2 would not affect fish and aquatic wildlife.

Cultural Resource Management

Cultural resource management under Alternative 2 would not measurably affect fish and aquatic wildlife and plants. The Empire Ranch headquarters' interpretive and educational program could increase public awareness of fish and aquatic wildlife species and habitats. This awareness would likely contribute to increased public support for further constraints on activities that harm native aquatic wildlife in the basin, thus benefitting these species.

**From Land Use Allocations**

Mineral Development

By eliminating the potential for mining and mineral leasing on public lands in the planning area, Alternative 2 would greatly reduce the risk of habitat degradation from sedimentation, unsustainable water use, and contamination. This action would ultimately improve aquatic habitat quantity and quality from that under Alternative 1. Increased security from habitat-altering land use practices would translate to increased security for populations of federally listed and common fish and aquatic wildlife and plants.

Utility Rights-of-Way and Land Use Authorizations

Alternative 2 would restrict utility rights-of-ways to existing corridors, thereby lessening the risk of disturbance from construction and maintenance of new utilities that would occur under Alternative 1. The limits on utility and other right-of-way authorizations would help minimize disturbance to the watershed, riparian area, and aquatic habitat. In addition, BLM would restrict infrastructure in the basin to support development. This restriction would inhibit suburban growth. Such growth would

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harm aquatic habitats that support fish and aquatic wildlife and plants.

##### Off-Highway Vehicle Management

Under Alternative 2, off-highway vehicle management would affect fish and aquatic wildlife much as under Alternative 1.

##### Road Designations

The closing and rehabilitating of all but one road crossing the creek **perennial Cienega Creek** under Alternative 2 would help prevent excessive sedimentation from degrading aquatic habitats. Alternative 2 would present less risk than Alternative 1 of death or injury from vehicles, diminished water quality from vehicle fluids, and contamination of the creek from the illegal transfer of sport fish or other nonnative aquatic animals. Such contaminations would most certainly place the Cienega Creek fish community at risk of being lost and replaced by introduced nonnatives.

##### Recreation Management

Closing or limiting motor traffic access along Cienega Creek would prevent more degrading of habitat from increased sedimentation and bank damage by off-highway vehicles at 11 creek crossings. Foot and horse travel would increase along Cienega Creek as the planning area becomes more well known and recreation use increases. Increased travel is likely to slightly increase injury or death of Gila topminnow, which occupy the shallow margins of the creek in large numbers. This injury and mortality would only negligibly affect the Cienega Creek population of Gila topminnow.

Some curious sightseers would harass, pursue, and capture leopard frogs and Mexican garter snakes. Visitors are also likely to trample some Huachuca water umbels. The level of impact under Alternative 2 would be less than under Alternative 1. Establishing a recreation permit

system should help ensure the sustainability of aquatic habitats and populations of aquatic species.

##### Arizona Trail

Under Alternative 2, foot and horse travel would increase along Cienega Creek as the Arizona Trail improves access to remote areas and attracts more visitors to the area. The result would be more impacts of the type described above for recreation management.

##### Livestock Grazing

Impacts from livestock grazing management under Alternative 2 would be similar to those under Alternative 1. Livestock use of ~~two additional~~ crossing lanes **and watering areas** will disturb ~~an additional 0.1~~ **about the same** acreage of aquatic habitat until alternate waters can be developed and then the aquatic acreage impacted would be reduced by about **one acre**. The expanded biological planning process should further help protect aquatic fish and wildlife through increased monitoring and improved watershed condition. Fencing of Nogales and Little Nogales Springs would protect these sensitive aquatic habitats from livestock impacts.

#### **From Special Designations**

##### Areas of Critical Environmental Concern

ACEC designation would emphasize improving watershed and riparian health. This emphasis would in turn benefit aquatic habitat used by fish and aquatic wildlife and plants. This designation would direct more BLM resources to conserving the planning area's fish and wildlife habitat and benefit fish and aquatic wildlife.

## ***Impacts to Fish and Aquatic Wildlife from Alternative 3***

### **From Desired Resource Conditions**

#### *Watershed, Fish and Wildlife, Visual and Cultural Resource Management*

Impacts under Alternative 3 would be the same as under Alternative 2.

### **From Land Use Allocations**

#### *Mineral Development*

Impacts under Alternative 3 would be similar to those under Alternative 1, except that they might occur over a much larger area of the watershed. Alternative 3 would protect Cienega Creek, Lower Empire Gulch, Cinco Ponds, Mattie Canyon, and Nogales and Little Nogales Springs from direct surface disturbance. Upper Empire Gulch would not have the same protection from the direct impacts of mining.

#### *Utility Rights-of-Way and Land Use Authorizations*

Impacts under Alternative 3 would be the same as under Alternative 2.

#### *Off-Highway Vehicle Management*

Impacts under Alternative 3 would be the same as under Alternative 1.

#### *Road Designations*

Road closures and restrictions under Alternative 3 would affect fish and aquatic wildlife and plants much as under Alternative 2, except that under Alternative 3, BLM would close and rehabilitate a smaller acreage of roads.

#### *Recreation Management*

Recreation under Alternative 3 would affect fish and aquatic wildlife and plants much as under Alternative 2.

#### *Arizona Trail*

Alternative 3 would locate the Arizona Trail in the riparian area through the Narrows.

Recreation levels high enough to allow bank erosion are likely to alter habitat properties, such as a change from narrow, deep pools with cover to wide, shallow pools. Channel adjustments from the trail, if located on the floodplain, would directly harm aquatic habitat, fish, and aquatic wildlife and plants in contrast to Alternative 1, which would not affect these habitats and species. A reduction in deep pool habitats would likely harm Gila chub, leopard frogs, and Sonoran mud turtles, which rely on these habitats. Use of the Arizona Trail could result in the following:

- Injury or death to Gila topminnow.
- Harassment of leopard frogs, Gila chubs, and Mexican garter snakes.
- Damage to vegetation cover.
- Trampling of stream banks.

#### *Livestock Grazing*

Livestock grazing management under Alternative 3 would affect fish and aquatic wildlife much as under Alternatives 1 and 2, except that watershed condition and function under Alternative 3 might suffer during droughts. This type of grazing management might be translated into adverse effects to the hydrology of Cienega Creek, including increased peak flow from flooding and sedimentation following extended droughts. Alternative 3 is more likely than Alternatives 1 or 2 to have a lasting negative impact over the long-term on aquatic habitats, fish, and aquatic wildlife and plants.

### **From Special Designations**

#### *Areas of Critical Environmental Concern*

Under Alternative 3, the planning area's ACEC would amount to only 4,859 acres (roughly 10% of that under Alternatives 2 and 4) but would still cover most aquatic habitats including:

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Cinco Ponds, Lower Empire Gulch, Mattie Canyon, and Nogales and Little Nogales Springs. The ecological integrity of Upper Empire Gulch would not be protected by ACEC designation and management emphasis. The impact to fish and aquatic wildlife and plants would be more beneficial than under Alternative 1, but not as beneficial as under Alternatives 2 and 4.

### ***Impacts to Fish and Aquatic Wildlife from Alternative 4***

#### **From Desired Resource Conditions**

##### *Watershed, Fish and Wildlife, Visual and Cultural Resource Management*

Impacts under Alternative 4 would be the same as under Alternative 2.

#### **From Land Use Allocations**

##### *Mineral Development*

Mineral development under Alternative 4 would affect fish and aquatic wildlife the same as under Alternative 2.

##### *Utility Rights-of-Way and Land Use Authorizations*

Utility rights-of-way and land use authorizations under Alternative 4 are less likely to indirectly disturb aquatic habitat than under Alternatives 1, 2 and 3, because Alternative 4 would designate only one utility corridor. Watershed disturbances would only slightly affect fish habitat by causing increased sedimentation and runoff, especially if construction disturbance is mitigated. The designation and later use of this single utility corridor are likely to slightly harm federally listed or common fish and aquatic wildlife and plants.

##### *Off-Highway Vehicle Management*

Impacts under Alternative 4 would be the same as under Alternative 1.

##### *Road Designations*

Road closures and restrictions under Alternative 4 would affect fish and aquatic wildlife and plants much as under Alternative 2.

##### *Recreation Management*

Recreation under Alternative 4 would affect fish and aquatic wildlife and plants much as under Alternative 2.

##### *Arizona Trail*

The Arizona Trail under Alternative 4 would affect fish and aquatic wildlife and plants much as under Alternative 2.

##### *Livestock Grazing*

Under Alternative 4, the crossing lanes for livestock management would no longer disturb 1,800 linear feet of aquatic habitat (less than 0.5 acre) **in the crossing lanes and up to 1.5 miles of aquatic habitat in the riparian watering areas.** Large numbers of cattle would no longer cross Cienega Creek and pose a small risk of injury to fish, frogs, garter snakes, and the Huachuca water umbel. Fish and aquatic wildlife and plants are expected to benefit only slightly more than under the other alternatives because most of Cienega Creek (**about 90%**) is already excluded from livestock grazing and the rest of the creek is scheduled to be fenced this year, **resulting in winter-use only in most of the other 10% of the creek.**

Most stock ponds would be retired or converted to wildlife use. To mitigate the probability of contamination of stock waters by illegal transplants of nonnative fishes and frogs by the public, water sources retained for wildlife or recreation use would still be supplied with water only seasonally and would be allowed to dry annually. These "repressos" would dry up naturally in one to three months after the pumping is stopped.

Upland vegetation management would promote a high level of channel stability, which would

enhance cienega-type riparian development. Upland vegetation management would reduce the prevalence of shrubs and increase watershed cover by promoting an increase in perennial grasses.

Without livestock grazing, ecological sites would likely meet their potential for plant community composition and production sooner and more often than with livestock grazing. All of the alternatives for grazing management are likely to promote habitat development with a diversity of conditions, including the following:

- High levels of instream cover.
- A large range of depths and velocities.
- Riparian canopy cover that ameliorates seasonal extremes in water temperatures.

Alternative 4 is likely to benefit habitat development with the least environmental risk of the problems of livestock control (e.g., fences and gates) and operator compliance (i.e., rotating pastures on time). But the gains on public lands are likely to be offset by reductions in watershed conditions from traditional grazing practices or large reductions in watershed conditions from conversion of private ranches and State Trust Land to urban development (see Impacts to Watersheds and Impacts to Wetland/Riparian Areas sections **earlier in this chapter**).

### **From Special Designations**

Areas of Critical Environmental Concern  
ACEC management under Alternative 4 would affect fish and aquatic wildlife as under Alternative 2.

### **Impacts to Terrestrial Wildlife** (Including Threatened and Endangered Species)

**Scope of Analysis:** This section uses changes in

### *Impacts to Terrestrial Wildlife from Alternative 1*

habitat features and populations of terrestrial wildlife to compare the impacts of the alternatives on terrestrial wildlife.

### ***Impacts to Terrestrial Wildlife from Alternative 1 (Current Management)***

#### **From Desired Resource Conditions**

##### Watershed: Upland, Riparian, and Aquatic Vegetation Management

Alternative 1 would make no concerted efforts to treat upland vegetation. In the long-term shrub cover would increase in the upland sites and perennial grasses would decrease. Some portion of open grassland communities would change over time to a mesquite/shrub woodland with grass understory. Less open grassland habitat would exist for grassland wildlife species (such as pronghorn, Baird's sparrow, scaled quail). Species that prefer more shrub and tree cover (e.g., white-tailed deer, mule deer, Gambel's quail, Cooper's hawk, Bell's vireo) would have more habitat.

##### Fish and Wildlife Management

Current fish and wildlife management includes: consultations with the U.S. Fish and Wildlife Service to reduce adverse impacts on endangered or threatened species, and coordination with the Arizona Game and Fish Department to minimize impacts to fish and wildlife from land use authorizations and projects.

Studies, habitat improvements, and reestablishing terrestrial wildlife could potentially improve the viability of wildlife populations and habitat values on public lands. For example, a study of pronghorn home range could document the amount of grassland habitat needed to sustain the local pronghorn herd. If applied, this knowledge could result in the acquisition from willing sellers--through purchase, easement, or other means--of more

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grassland and could help maintain pronghorn herds in the planning area.

### Visual Resource Management (VRM)

Alternative 1 would retain visual resource management (VRM) Class III for the planning area. This VRM classification is not expected to reduce the value or amount of upland habitats or reduce the viability of wildlife populations. Stipulations to ensure conformance with VRM Class III could slightly increase costs of habitat improvement projects.

### Cultural Resource Management

Under Alternative 1, BLM would survey cultural resources as needed and stabilize or preserve historic buildings. Cultural resource survey, preservation, or stabilization would disturb about two acres of upland habitats in the planning area. This level of habitat disturbance would not noticeably reduce upland wildlife habitat use, habitat quality, or population viability.

## **From Land Use Allocations**

### Mineral Development

Under Alternative 1, a total of 458 acres of desert scrub, disclimax grassland, and oak woodland habitat in the Empire Mountains would remain open to locatable and leaseable mineral development. The entire area would be closed to salable mineral development. An unknown number of mines might be developed under Alternative 1. The extraction of locatable or leaseable minerals would disturb the ground surface. Wildlife habitat loss and degradation would result from the following activities:

- Clearing vegetation and topsoil for pits, stockpiles, roads, ancillary facilities, storage sheds, offices, housing, parking, and loading areas.
- Excavating mineral materials, gravel, and rock.

- Stockpiling mineral material, ore, leaching piles, and overburden.
- Clearing habitat and installing trailers, storage areas, mills, equipment yards, material depots, refuse piles, fueling areas, and separation areas.

Mining of locatable or leaseable minerals under Alternative 1 would degrade or eliminate an undetermined amount of oak woodland habitat for such species as Mearns's quail, white-tailed deer, and alligator lizard. Mining would also disturb some agave, which grows in scattered clumps in both woodland and grassland, and might harm the endangered lesser long-nosed bat, which feeds on nectar and pollen from agave blossoms.

The excavation, surface disturbance, and vehicle traffic from mineral development accidentally kill reptiles, especially slow-moving species such as western box turtles, rattlesnakes, and Gila monsters. This mortality could result in long-term declines in reptile populations when combined with mortality from disease and predation.

Under Alternative 1, mineral extraction would disrupt wildlife use. Mining often creates noise and dust and results in vehicle traffic and human presence, all of which scare away large wildlife species such as pronghorn, deer, and javelina. Ockenfels et al. (1994) found that pronghorn tend to avoid habitat within one kilometer (0.6 mile) of maintained roads. De Vos et al. (1984) found that mule deer avoid habitat within 400 meters (0.25 mile) of human intrusions. From these studies one can reasonably conclude that large ungulate species would avoid an area within a half mile or more of a mine.

Mine access roads would encourage increased incidents of poaching by improving access to a given area. Poaching can be a significant source of mortality and could lead to long-term

population declines, reducing the carrying capacity of otherwise suitable habitat. Impacts of poaching are described in more detail in the off-highway vehicle section below.

Alternative 1 would subject only a small portion of the planning area to the negative impacts discussed above. About 48,542 acres would remain closed to mineral development and would not be subjected to the above-mentioned impacts.

#### Utility Rights-of-Way and Land Use Authorizations

Alternative 1 would designate no right-of-way corridors within the planning area. As a result, utilities could propose rights-of-way for almost any area if the rights-of-way would not conflict with threatened or endangered species or sensitive cultural resources. BLM might grant rights-of-way that would significantly disturb wildlife over the long-term.

Construction along rights-of-way and at communication sites disturbs the ground surface and destroys native wildlife habitats. Surface disturbance allows for potential colonization by nonnative plants and animals, such as Lehmann's lovegrass, Johnson grass, starlings, and house sparrows. These species might out compete native plants and wildlife and reduce species diversity in the long-term.

Visitors tend to adopt rights-of-way and communication site roads as recreation travel routes. These roads also become areas accessible for poaching, off-road vehicle use, and other unauthorized activities. Such rights-of-way and land use authorizations could have impacts of the type described for mining roads and off-highway vehicles.

#### Off-Highway Vehicle Management

Alternative 1 would allow public motor vehicle use on ~~116.4~~ 113.2 miles of road. Throughout

#### *Impacts to Terrestrial Wildlife from Alternative 1*

the planning area, levels of recreation use would be high and likely to harm wildlife and habitat.

Vehicle-based recreation disturbs wildlife. Such recreation often involves noise, vehicle traffic, and the presence of visitors and their dogs all of which scare large wildlife species, such as white-tailed deer and javelina away from the disturbed area. These species often reduce their use of an area surrounding recreational activities, especially those involving large numbers of people or pets.

Increased vehicle traffic (both authorized on-road use and unauthorized off-road use) would accidentally kill animals, especially slow-moving reptiles such as western box turtles, rattlesnakes, and Gila monsters, and other nongame species. When combined with death from other sources, such as disease and predation, this mortality could cause long-term declines in reptile populations.

Road access would also increase incidents of poaching. Roads increase the access to a given area and the likelihood of poaching. Large mammals are more easily poached, especially at night (Connolly ~~1981~~ 1991) and reptiles are more easily illegally collected in areas accessible by road. Brittell and Pierce (1984) found that almost 50% of mortality of radio-collared mountain lion was due to unregulated killing (including poaching) in Washington. Pursley (1977) estimated that the take of mule deer in New Mexico during closed season was 34,000, about the same as taken by legal harvest. This source of mortality could be significant and could lead to long-term population declines and reduce the carrying capacity of otherwise suitable habitat.

Unauthorized off-road travel by recreational users under Alternative 1 would disturb vegetation cover. Such users would leave



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roadways to retrieve downed game, explore new areas, or gain access to hilltops for better views or campsites. Once one vehicle travels through an area, the tracks become a visible path for future use. Over time a new “wildcat” road becomes established in a previously roadless area. This process inevitably occurs where roads are present roughly in direct proportion to the level of recreation use.

The unauthorized off-road travel and resultant road establishment would disturb stands of agave, which grow in open grasslands. Vehicles driving over plants and compacting soil would reduce the density of these plants and indirectly harm the endangered lesser long-nosed bat, which feeds upon the nectar and pollen of the flowering agaves.

Other indirect impacts of the roads consist of human presence and vehicle traffic, which kill other nongame wildlife as well. This mortality can take several forms. All forms of wildlife, especially slow-moving species, such as western box turtles, rattlesnakes, and Gila monsters, can suffer mortality from accidental crushing by passing vehicles. Rattlesnakes and Gila monsters and other species are exposed to deliberate killing when found by motorists who fear or loath reptiles, especially venomous ones.

Some species of reptiles are considered valuable and captured for the illegal pet trade. This collection removes these individuals from the breeding population and constitutes effective, if not actual, mortality. Though not the problem of decades ago, hawks, vultures, and other protected avian species are still subject to shooting (Muth and Bowe 1998). These sources of mortality, all road related, could cause long-term declines in wildlife populations when combined with mortality from other sources such as disease and predation.

#### Road Designations

Alternative 1 would keep ~~116.4~~ 113.2 miles of road open to recreational use and impose only a few road closures or restrictions. High levels of recreation use throughout the planning area could be expected. The impacts would be as described in the off-highway vehicle designation section above.

#### Recreation Management

The lack of designation of recreation zones would result in dispersed recreation throughout the planning area. Because all-terrain vehicles and other off-road and four-wheel drive vehicles could access the entire area, the impacts would be as previously discussed in the off-highway vehicle designation section above.

Because BLM would build no designated camp areas or group sites, Alternative 1 would not have the impacts of concentrated use associated with such developments (which are discussed later for Alternatives 2, 3, and 4). Visitors would still engage in dispersed recreation throughout the planning area. The impacts of this dispersed recreation are described in the off-highway vehicle designation section above.

#### Arizona Trail

Alternative 1 would not designate a route for the Arizona Trail across the planning area and the trail would not affect wildlife resources.

#### Livestock Grazing Management

The vegetation consumed by livestock as forage represents a loss of potential cover and forage for wildlife in the planning area. Many factors influence the relative impact to wildlife species and habitats from this vegetation consumption. The amount of vegetation available **as useable forage** in any year is determined largely by rainfall amounts and patterns. Cattle can consume differing percentages of the **available useable** forage depending on many variables including: stocking rates, pasture rotation, season, and types of forage.

The biological planning process which is used on the Empire-Cienega allotment, under current management, attempts to address these variations in vegetation production by making annual adjustments in stocking rates, employing flexible rotations, and addressing livestock-wildlife conflicts as they arise.

Utilization is another important factor. Utilization indirectly relates to the vertical cover (height) of vegetation removed, but utilization is usually unevenly distributed across the landscape due to livestock movement patterns and preferences for certain areas. Utilization is usually measured as an average of the use in a pasture, and some areas in a pasture might have greater utilization than other areas. If livestock are on a rotational system and plants are grazed only once in a growing season, the plants can regrow after cattle are moved out, thereby ensuring cover would remain for watershed and wildlife. But repeatedly using plants in one growing season would affect the reserves the plant has for growth in the next growing season as well as the amount of standing cover that remains. When the nutritional value of forage is low, cattle might consume up to twice as much to obtain the nutrients they need (SCS 1976). There has been a lack of certain types of monitoring data including utilization levels in pastures and measurements of standing cover for the allotments under Alternative 1, which has limited the effectiveness of the biological planning process to identify and resolve some of the grazing management issues.

Another potentially important factor is the dietary overlap (similarity in plants consumed) among livestock and wildlife species. This overlap represents the degree of competition between cattle and wildlife for forage plants. Cattle often prefer certain species of plants over others and might reduce the relative abundance of preferred species in an area. However, loss of wildlife cover from livestock grazing, rather than competition for specific forage species, has

been the issue on the allotments in the planning area.

Alternative 1 would permit livestock grazing on 41,855 acres of grassland and oak woodland habitats on public land. Since these cattle would graze on State Trust Lands or private lands during portions of the year, the number of livestock on public land at any one time would vary widely from 832 cattle (maximum allowable stocking rate on public land) to perhaps 400. If all allotments were stocked at the maximum allowable rate on public lands during a high rainfall year, livestock would consume 8 million pounds of forage, representing about 46% of the available useable forage on public land (See Chapter 2, Table 2-13). The same number of livestock would consume 68% of the available useable forage during a normal rainfall year and all available useable forage during a low rainfall year.

Under Alternative 1, livestock would graze 64,649 acres of grassland and woodland habitat on State Trust Lands. The maximum stocking rate on State Trust Lands in the planning area is 13,776 animal unit months (or 1,148 cattle per year). The 1,148 cattle would consume 11 million pounds of forage or 41% of the available useable forage on State Trust Lands during a high rainfall year. The same number of livestock would consume 61% of the available useable forage during a normal rainfall year and 92% of the available useable forage during a low rainfall year.

For all allotments and land ownership combined, the maximum stocking rate is 2,064 cattle, which would consume 19.8 million pounds of forage annually that represents 44% of the total available useable forage during a favorable year on allotments in the planning area. If livestock numbers were held at the maximum stocking rate during a normal rainfall year, livestock would consume 66% of the available useable forage. During an unfavorable

rainfall year, livestock held at the maximum stocking rate would consume 100% of the

available useable forage. (Table 4-1)

**Table 4-1  
Forage Consumed by Livestock on All Allotments in the Planning Area  
Under Three Rainfall Regimes  
Alternative 1, Las Cienegas RMP**

Rainfall Regime	Cattle Year-Long	Million Pounds of Forage Consumed/Year	% of Total Production Consumed	% of useable Forage Consumed (at 35% utilization limit)
High (Favorable)	2,064	19.8	11	44
Normal	2,064	19.8	16	66
Low (Unfavorable)	2,064	19.8	24	100

But if livestock operators continue to adjust numbers on the Empire-Cienega allotment as they have done in the past, based on input from the Biological Planning Team, the percent available useable forage consumed would stay fairly constant on the allotment (See Chapter 2, Table 2-14). In a favorable year, 1,436 cattle on the Empire-Cienega allotment would consume 13.8 million pounds of forage, representing 41% of the available useable forage. In a normal year, 1,037 cattle would consume 10 million pounds of forage, representing 45% of the available useable forage. In an unfavorable year, 662 cattle would consume 6.4 million pounds of forage, representing 44% of the available useable forage. **The variable stocking maintains a reserve of over one-half the useable forage in case of unexpected events such as wildfire. This reserve combined with one-half the total vegetation production which was initially left for rangeland health as watershed cover should ensure that the basic needs of the resource are being met. Less than 25% of the total production is being used for livestock forage.** Because the Empire-Cienega allotment represents 68% of the planning area's grazed acreage, adjustments in stocking rate on this

allotment significantly affect overall stocking rates and corresponding vegetation conditions in the planning area.

**Tables 2-13, 2-14, and 4-1 represent a simplified model of the relationship of forage production and livestock consumption and assume that forage consumption by livestock is at a relatively constant rate under all conditions. The actual relationships are more complex, but the tables were developed to provide for comparison of the different grazing strategies: across alternatives.**

These figures account only for the vegetation consumed by livestock. Trampling would also reduce vegetation cover. Livestock usually trample areas around reservoirs, springs, creek crossings, corrals, and other sites where they concentrate. The acreage of trampled habitat around each watering point can vary, but a zone of overuse of 1/4 mile radius around each water is a conservative estimate. Using the formula for calculating the area of a circle ( $\pi$  times radius squared ( $\pi r^2$ ) or  $3.141 \times 0.06$ ) each watering point would result in 0.2 mi<sup>2</sup> of disturbance or about 122 acres of heavily

disturbed ground. For 30 earthen reservoirs, trampling would disturb 3,660 acres (5.7 mi<sup>2</sup>) spread out over the allotments.

Livestock grazing could affect wildlife more during years of below-normal rainfall (six times between 1988 and 1997). The degree of impacts depend on the timing and extent of reductions in livestock numbers during drought. The impact of livestock grazing could be less during years of above-normal precipitation (three times between 1988 and 1997 as measured at the Empire west pasture Agricultural Research Service rain gauge).

Under Alternative 1, livestock would graze most grassland habitats, reducing cover or forage for grassland wildlife species such as Baird's sparrow, pronghorn, and grasshopper sparrow. If more than 50% ground cover is removed, which could occur at the upper end of current utilization limit of 40-60%, habitat conditions would improve for species that benefit from increased bare ground, such as horned larks, jackrabbits, and meadow larks.

The standing cover (stubble height) is an important factor for many of the grassland species, **including pronghorn and grassland sparrows for which sub-objectives were developed.** Measures of livestock use by percent utilization by weight fail to adequately measure standing cover and, under current management, **these or other standing cover measurements have not been made. Except on the Empire-Cienega allotment, upland vegetation data has not been regularly collected and the biological planning process has not been used.** Continued declines in pronghorn numbers indicate the need to collect additional monitoring data to better determine the factors leading to their decline in the planning area.

Livestock would also graze most oak woodland habitats, reducing habitat components, mainly cover, for such species as Mearn's quail, white-

tailed deer, and bunchgrass lizard.

Studies have found that the density of bunchgrass lizards is up to 10 times higher in ungrazed than in grazed areas (Bock et al. 1990). Ballinger and Congdon (1996) documented the elimination of bunchgrass lizard populations in severe cases of grazing. Although heavy grazing can increase *Oxalis* sp. (a plant whose bulbs are preferred by Mearn's quail), livestock grazing that removes more than 55% by weight of available useable forage can eliminate local quail populations (Brown, R. 1982). Livestock utilization of 46-50% by weight appears to create habitat conditions that are marginal for maintaining quail populations. This utilization could occur in some areas under the current utilization limit of 40-60%.

Studies in the nearby Santa Rita Mountains showed that white-tailed deer use declined steadily with increasing livestock utilization (Brown, M. 1984). In most vegetation associations, deer use (as measured by pellet group counts) declined to near zero as Brown's "cattle index" (the square root of the cattle fecal count) approached 18. This decline might be due to forage competition, shifts in plant composition, or some combination of the two factors caused by livestock grazing. Although only a minor part of white-tailed deer diet, grass is a major cover component.

In another study, heavy livestock grazing before fawning reduced cover for newborn fawns and could increase vulnerability to predation (Ockenfels et al. 1991). Heavy use by large numbers of livestock, combined with lower than normal rainfall, would probably result in poor physical condition of does and in reduced reproduction (Smith 1984). Continuing current livestock management where stocking rates are varied in response to annual vegetation production and vigor would tend to reduce these impacts. **However, the current allowable**

**utilization rate of 40-60% may result in heavy livestock use in some areas.**

Some livestock would consume growing agave stalks found in scattered clumps in both woodlands and grasslands under Alternative 1. Agave are a major food source for the lesser long-nosed bat. On the Empire-Cienega allotment the variability of the grazing system varies the degree of this impact. Mature agave, which flower only once, produce flower stalks in the spring and early summer. In the early stages the growth points, which are highly edible, are accessible to grazing animals. Livestock mainly graze the loamy hills (the main ecological sites producing agave) in winter before agave produce stalks or in late summer after stalks have grown to an inaccessible height. During the spring, most livestock on the Empire-Cienega allotment usually graze the loamy bottom ecological sites (sacaton bottoms with few agave), greatly reducing their consumption of agave growth points.

But during spring livestock operations often use the loamy hills as bull pastures, so bulls may be grazing stalks on these ecological sites. The U.S. Fish and Wildlife Service Biological Opinion for the Cienega Creek Interim Grazing Plan lists studies of livestock use of agave as a nonbinding conservation recommendation (FWS 1996). Under current management with minimal monitoring, BLM has not begun or proposed this study.

Under current management, BLM has excluded **about** 659 acres of Cienega Creek and Empire Gulch from livestock grazing, including most riparian areas on public land. The Riparian Area Condition and Evaluation (RACE) monitoring completed in 2000 found about 12.5 miles of the riparian area in satisfactory condition and 1.6 miles in unsatisfactory condition (See Chapter 3, Riparian **and Wetland** Area Conditions). Cattle still have access to small amounts of riparian area at crossing lanes

**(2.7% of total riparian area)** and in watering areas along Cienega Creek **(8.6 % of total riparian area) including at the Narrows along Cienega Creek during the winter**, and in portions of Empire Gulch, Gardner Canyon, Cinco Ponds, and at Nogales Springs.

The remainder of Cienega Creek is scheduled to be fenced from livestock except for six **existing** crossing lanes that include about **four 8.3** acres of riparian habitat **and in winter-use watering areas of about 26 acres**. In these areas, cattle would forage on riparian vegetation, consuming and trampling seedling trees and shrubs. The result would be a loss of cover and structural diversity of woody riparian trees in small areas **(less than 10% of total riparian area)**.

Suitable habitat for the endangered willow flycatcher is present in Cienega Creek (See Chapter 3, **Threatened, Endangered, and** Special Status Species section). **No nesting flycatchers have been recorded in the area, but the area has not been thoroughly surveyed.** **In 2001, an adult willow flycatcher feeding a fledgling near a willow flycatcher nest was found along Cienega Creek during willow flycatcher surveys.** Use of the crossing lanes and other areas open to grazing might fragment the habitat and affect its suitability for Southwestern willow flycatcher. Use of the lanes as described above could degrade about **four 8.3** acres of suitable habitat within or next to the crossing lanes. **However, the willow flycatcher nest was located just upstream of a livestock crossing lane. Continued monitoring and a larger sample size of flycatcher nests would be needed to better understand the impacts of crossing lane use on flycatchers and their habitat.**

Within 2-3 years of excluding livestock from the previously grazed riparian areas, suitable willow-flycatcher habitat is generally created. But over time, areas excluded from grazing for several years also lose habitat potential as the trees begin to age. Density of cover in the 1- to

6-foot height declines as the Goodding willow and Fremont cottonwoods age. Disturbance, such as periodic floods and historical wildfires opened up these areas and created new habitat patches. With wildfires suppressed, more active management might be needed to maintain extensive areas of suitable habitat in this relatively stable system.

Some of the 14 planned livestock developments (stock ponds) would be placed within four miles of riparian areas. These facilities provide improved foraging habitat (in the form of bare ground with manure and weed seeds) for mourning doves, starlings, house sparrows, and brown-headed cowbirds. The brown-headed cowbird is a nest parasite of the Southwestern willow flycatcher, Bell's vireo, yellow warbler, and other song birds. **Potential for** cowbird nest parasitism of the Southwestern willow flycatcher and other species might increase due to the proposed waters next to Cienega Creek. Cowbirds have been shown to fly up to four miles from feeding areas to engage in nest parasitism (Robinson et al. 1995). Cowbirds would likely be present in the planning area regardless of livestock grazing on public lands because of the closeness of residential areas and horse facilities on private land. **However, no studies or monitoring have been conducted to determine relative cowbird numbers and whether nest parasitism is occurring and, if so, to what extent.**

Most roads in the planning area were originally built and maintained to service livestock management facilities (e.g., wells, pumps, corrals, fences, housing for ranch workers, and other facilities). These roads are also open to the public and are used by visitors. The impacts on wildlife from use of these roads have previously been described under off-highway vehicle impacts and impacts of roads for mineral development.

Alternative 1 proposes 21.5 miles of fence for

livestock control. This fencing should not restrict movement of pronghorn, mule deer, and white-tailed deer, particularly, deer fawns because BLM fences are designed to allow passage by these species.

Decisions on livestock management and stocking rates for the Empire-Cienega allotment (the planning area's largest) have been made and would continue to be made with input from a Biological Planning Team under Alternative 1. Current levels of vegetation and watershed monitoring and analysis would continue under this alternative. BLM has conducted limited monitoring and analysis of wildlife species and habitat components (mainly for grassland sparrow habitat and endangered species) and would continue to do so.

The biological planning process has been used on the Empire-Cienega allotment since 1994 and has produced many changes in the management of the livestock operation. The grazing permittee first proposed this process and has voluntarily implemented almost all recommendations developed through it, including the following:

- Leaving more cover for sparrows and pronghorn, which use grassland sites on the south end of the ranch.
- Fencing most of the riparian habitat along Cienega Creek, Mattie Canyon, and Empire Gulch.
- Pumping water for pronghorn and other wildlife.

**Some of the improvements in ecological conditions which have resulted at least in part from these management changes include bringing the majority of riparian areas into proper functioning condition, expansion of wetland areas in the floodplain of Cienega Creek, expansion in length of perennial water in Empire Gulch, expansion of pool habitats for**

**Gila chub and Gila topminnow along Cienega Creek, and, most recently, successful nesting by willow flycatchers along Cienega Creek.**

The ability of the Biological Planning Team, under Alternative 1, to recommend effective livestock management changes that benefit wildlife is constrained by the limited amount of monitoring data being collected and the need to integrate the impacts of other resource uses. **It has been and would continue to be difficult to determine the effectiveness of management changes, particularly on wildlife species, made as a result of the current biological planning process without increased levels of monitoring.**

**From Special Designations**

Areas of Critical Environmental Concern

Alternative 1 would designate no areas of critical environmental concern. Hence, the impacts of grazing, mining, recreation, rights-of-way, vegetation treatments, and fire management on wildlife would be the same as those described in the preceding Alternative 1 impact discussions.

***Cumulative Impacts—Alternative 1 on Terrestrial Wildlife***

Species inhabiting oak woodland habitats, such as Mearns's quail, white-tailed deer, and bunchgrass lizard, would be subject to similar pressures from increased development and management on surrounding and intermixed lands. Unlike pronghorn, white-tailed deer are somewhat compatible with high levels of human disturbance and would probably persist over the long-term.

Increased development and management on surrounding and intermixed lands would constrict and eventually cut off movement corridors between mountain ranges, harming wide-ranging species such as jaguar, mountain

lion, black bear, and Gould's turkey, and dispersing individuals of other species such as bobcat, coati, and porcupine. Black bear, for example, might at first be attracted to humans because of refuse, bird food, and pet food. As these human-bear encounters increase from nuisance to dangerous levels, bears would be subject to lethal controls or removal. Such actions might reduce populations and eliminate bears from portions of their former range. This process has occurred recently in the Huachuca and Santa Catalina Mountains, where humans are rapidly encroaching.

Under Alternative 1, the Southwestern willow flycatcher would continue to use the riparian habitat along Cienega Creek during migration **and possibly during breeding.** This area has been documented as an important migratory stopover for many neotropical migratory bird species (Krueper 2000). ~~Although none have been documented as breeding within the planning area, willow flycatchers are highly opportunistic. Birds breeding 40-50 miles away could colonize the area (Krueper 2000).~~ **In 2001, an adult willow flycatcher feeding a fledgling near a willow flycatcher nest was found along Cienega Creek during willow flycatcher surveys. Continued monitoring in future years is needed to determine if flycatchers continue to use Cienega Creek for breeding and if use expands.**

Under Alternative 1, the likelihood of achieving the wildlife objectives would not be high because sufficient movement corridors might not remain to permit the maintenance of biological diversity desired in the objective. The high levels of human use likely under this alternative might increase the difficulty of successful recovery and reestablishing of species. Maintaining viability of priority wildlife species populations would also not be certain.

## *Impacts to Terrestrial Wildlife from Alternative 2*

Several adjustments in livestock management might also be needed to maintain the levels of vegetation cover desired in the objectives. Without monitoring data to support these adjustments, the needed modifications might never be made.

### ***Impacts to Terrestrial Wildlife from Alternative 2***

#### **From Desired Resource Conditions**

##### *Watershed: Upland, Riparian, and Aquatic Vegetation Management*

~~Activity plans for Alternatives 2, 3, and 4~~ prescribe integrated vegetation treatment for the Empire-Cienega and Empirita allotments to reduce the density of mesquite, sandpaper bush, catclaw, burroweed, and shrub species. Vegetation treatments would affect wildlife in both the short- and long-terms.

Areas treated with prescribed fire would temporarily lose vegetation cover and, therefore, habitat for species previously occupying the area. Fire would also kill some wildlife, particularly slow-moving species such as reptiles.

Pronghorn might benefit temporarily from new growth following prescribed fire if these fires burn in the southern portion of the Empire Ranch. Prescribed fires in the northern portion of the Empire Ranch or in the Empirita Ranch would not benefit pronghorn, because the topography in those areas is too eroded and rugged to support this species. Prescribed fire would destroy some agave. BLM would consult with the U.S. Fish and Wildlife Service (under Section 7 of the Endangered Species Act) for any project-level prescribed fire plans which adversely affect listed species or critical habitat.

If any goats or sheep were used for biological control, they would compete for forage with mule deer and white-tailed deer (BLM 1991). Habitat quality for ungulates (hoofed mammals) could decline.

It is uncertain to what extent vegetation treatments would restore desired grassland communities. In some areas, enough topsoil may not remain to permit native grasses to recolonize to densities of a climax grassland community, especially on limey slopes and uplands. Control of dense mesquite stands on the Santa Rita Experimental Range did **not** significantly increase perennial grasses (McCormick 1975). Research by W. Whitford in New Mexico also suggests that mesquite colonization is largely irreversible (Cordery 2000). The ecological chain of events that led to mesquite invasion in the Southwest is complex (Pinkava 1999). Mesquite is a native plant, well adapted to the region, and cattle are major consumers of mesquite pods and dispersers of seed (Pinkava 1999).

The decrease in mesquite and shrub cover on the 20,000 **or more** treatment acres, resulting from the combination of vegetation treatments, would reduce occupation of treated areas by species that favor dense cover usually found in mesquite or desert shrub habitat. Cover would decline for such species as bunchgrass lizard, desert spiny lizard, Abert's towhee, Bell's vireo, Lucy's warbler, and Cooper's hawk. Use of the treated areas by dove, Gambel's quail, cottontail, mule deer, and white-tailed deer would decrease (BLM 1991).

These treatments would tend to favor species that prefer open habitats. Such species include vesper sparrow, Cassin's sparrow (BLM 1991), horned larks, and meadow larks. Species such as Baird's sparrow and grasshopper sparrow would benefit from conversion to more open grassland habitat. But grazing rest must be long enough (at least two years) to allow for



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significant increases in native grass cover (BLM 1991). If nonnative species (such as Lehmann lovegrass) increase as a result of the treatments, then Baird's sparrow and grasshopper sparrow would not benefit.

The removal of livestock from most of the riparian area of Cienega Creek and its tributaries has improved riparian conditions and allowed most areas to return to proper functioning condition (See Chapter 3, Riparian and Wetland Area Condition). Localized impacts from cattle crossing lanes and watering areas would continue to include the following:

- Soil compaction of stream banks.
- Reduced stream bank cover.
- Reduced tree and shrub density.
- Reduced wildlife species diversity at watering areas and other sites where grazing is allowed as described under Alternative 1.

Limiting livestock grazing in riparian zones or using livestock grazing in riparian areas as a management tool would affect wildlife and wildlife habitat. Time lags in detecting the overuse of these areas could result in unacceptable levels of impacts. Impacts in acres of riparian habitat, stream miles, or the degree of wildlife impacts would depend upon the specific project proposal. BLM would complete environmental analyses for projects and consult with the U.S. Fish and Wildlife Service for any projects that might affect federally listed or proposed species or critical habitat.

BLM would reduce the loss of riparian vegetation and wildlife cover, especially for riparian birds, by the following actions:

- Restricting motor vehicles to designated crossings.

- Limiting camping.
- Prohibiting gold panning.
- Banning wood cutting.
- Limiting range and recreation developments.

Most of the riparian zone along Cienega Creek is in satisfactory condition with stream bank stability above 75%. Ensuring that activities do not cause bank stability to drop below 90% would improve the protection of riparian areas and wildlife habitats.

Through the biological planning process and by applying the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration, BLM could analyze proposed activities and recommend how to eliminate these impacts. If these recommendations are followed, then stream bank stability would not decline and no riparian habitat would be lost.

Potential positive impacts include small improvements in stream bank cover on specific sites. The nature and degree of impacts on wildlife habitat and species would depend upon the proposals and actions related to these measures.

#### *Fish and Wildlife Management*

The impacts of proposals to consider reintroductions, range extensions, and supplementing populations of selected wildlife species (e.g., aplomado falcon, Gould's turkey, beaver, black-tailed prairie dog, pronghorn) would depend on the following:

- Results of habitat suitability assessments
- Public input
- Agency commitment

- Funding availability
- Other factors

Enough quality habitat might not exist to support viable populations of some of these species within the planning area. Some species, such as Gould's turkey, might require movement corridors to nearby mountain ranges. The constriction of these movement routes by human intrusion and development might greatly curtail the planning area's ability to support this species. Public attitudes might be hostile to reestablishing species extirpated due to conflicts with agriculture, such as the prairie dog. Hence we cannot now adequately analyze the impact of this measure. Populations could be reestablished or expanded to benefit the wildlife species in question only if all of the following conditions are met:

- Evaluations and public attitudes are positive.
- Habitat quality and quantity are suitable.
- Special needs of a given species (such as for movement corridors and migration resting points) are met.
- Needed funding can be obtained.
- Agencies cooperate.

Not enough quality habitat might exist on public land to support a viable pronghorn population over the long-term. Until this habitat is evaluated, we cannot evaluate the impact of this measure. Pronghorn herds have been known to persist in spite of human intrusions (Ockenfels et al. 1994). Habitat can be suddenly lost due to constraints in movement routes between core habitat areas. Such a loss is suspected to have occurred already in the Sonoita area where new

homes and fences are being built. Managing for a mosaic of priority habitats could improve habitat for pronghorn, Baird's sparrow, grasshopper sparrow, Botteri's sparrow, and other terrestrial species. Potentially, habitat values could increase on public lands for species that depend on the priority habitat. If habitat does not improve, monitoring could provide clues as to corrective actions. BLM could then act to create the desired mosaic.

If it fully implements all actions proposed for pronghorn, BLM might be able to maintain a small but viable population of pronghorn on public land.

Actions to improve wildlife habitat by reducing habitat fragmentation would benefit wildlife. Enough actions might provide movement or dispersal corridors between the Santa Rita and Whetstone Mountains for large mammals including: mountain lion, black bear, white-tailed deer, and other wide-ranging species. From time to time, Gould's turkey might be able to travel along riparian corridors and use woodland habitats in the planning area.

But these efforts might not succeed with increased recreation. The creation of the off-highway vehicle (OHV) staging area and designated OHV trail along Oak Tree Canyon on national forest lands to the west of the planning area have increased human activity. Because ungulates and other wide-ranging wildlife tend to avoid the noise and disturbance created where many vehicles and visitors gather, Oak Tree Canyon is probably no longer suitable as a wildlife movement corridor.

**Visual Resource Management**  
Under Alternatives 2, 3, and 4, BLM would designate visual resource management (VRM) Class II for public lands within the planning area. This VRM classification is not expected to reduce the value or amount of upland habitats or reduce the viability of wildlife populations.

**Stipulations to ensure conformance with VRM Class II could slightly increase costs of habitat improvement projects compared with costs of conforming to VRM Class III under Alternative 1.**

Cultural Resource Management

Cultural resource management, mostly centered on the Empire Ranch headquarters, would slightly harm wildlife. More intensive use of the headquarters area could scare off large wildlife species, such as white-tailed deer and javelina. The area's planning and development would need to be sensitive to wildlife along Empire Gulch. Empire Gulch has high densities of nesting raptors and is often used by a variety of nongame and big game. The headquarters area could focus educational and interpretative themes on these and other wildlife. Such themes could increase public awareness of the planning area's wildlife issues.

**From Land Use Allocations**

Mineral Development

Under Alternative 2, no locatable or leasable mineral extraction would disturb the surface and none of the mineral development impacts described for Alternative 1 should occur. Lack of mineral development would benefit the grassland or oak woodland habitats and associated species, such as Baird's sparrow, pronghorn, grasshopper sparrow, bunchgrass lizard, Mearn's quail, white-tailed deer, and alligator lizard. Mineral extraction would not disturb agave or affect the lesser long-nosed bat, which forages on nectar and pollen from agave blossoms. By closing the remainder of the planning area to mining, Alternative 2 would not affect wildlife activity patterns, and impacts from new access routes described for Alternative 1 would not occur.

Utility Rights-of-Way and Land Use Authorizations

Alternative 2 would designate two rights-of-way

along preexisting routes. Developing rights-of-way would somewhat reduce cover for wildlife. Clearing wildlife cover to install towers, access roads, and construction staging areas would reduce the cover of trees, shrubs, and grasses near the route. Vegetation cover might not return to its previous condition because recreation users typically adopt these routes for travel and the right-of-way holder would periodically clear vegetation during right-of-way maintenance. Wildlife cover would decline on 180 acres.

Stands of agave, the plant that provides nectar and pollen for the lesser long-nosed bat, could grow in the path of new utility lines. Clearing of the utility lines could locally reduce agave density and affect this bat species. But BLM could stipulate avoidance of agave during the building of a utility line and enforce avoidance through the permitting process. Sometimes agaves can be replanted outside the path of construction to reduce losses.

The impacts of other land use authorizations would depend upon the nature and extent of the land use. No analysis can be performed at this time, but analysis would need to be done in site-specific environmental assessments.

The impacts of roads, which invariably occupy rights-of-way, have been discussed in previous sections on mineral development and off-highway vehicle management. These impacts, including vegetation loss, wildlife disturbance, poaching, and other wildlife deaths related to vehicles, would be somewhat less under Alternative 2 than under Alternative 1.

Off-Highway Vehicle Management

Limiting vehicles to designated roads would reduce road-related wildlife harm which is discussed under Alternative 1. Visitor use to the Empire-Cienega Planning Area might increase under Alternatives 2, 3, and 4 due to the following actions:

## *Impacts to Terrestrial Wildlife from Alternative 2*

- Promoting and enhancing motor vehicle access.
- Acquiring rights-of-way.
- Designating and maintaining roads and trails.
- Identifying access.
- Converting some motorized routes to nonmotorized routes to create a mix of routes.

Because more people would use the planning area for motorized travel and other forms of recreation, the following indirect impacts to wildlife are expected:

- Vehicle-based recreation would disturb wildlife as described for Alternative 1 but over a smaller area because Alternative 2 would close more roads than would Alternative 1 and convert other roads to nonmotorized use, as described below.
- Implementing a designated road system would increase authorized on-road traffic and decrease unauthorized off-road traffic. More vehicles on roads might increase the accidental killing of reptiles, especially slow-moving species such as western box turtles, rattlesnakes, and Gila monsters. When combined with deaths from other sources such as disease and predators, these deaths could cause long-term declines in reptile populations.
- Improved road access in some areas would increase poaching, allowing poachers to more easily take large mammals and illegally collect reptiles in areas accessible by road. This source of mortality could lead to long-term population declines and reduce the effective carrying capacity of otherwise suitable habitat. But proposed road closures and restrictions might offset these increases.

- Implementing a designated road system would reduce the disturbance of vegetation cover by allowing BLM to more easily detect and close unauthorized or wildcat roads. Impacts of unauthorized off-road travel have been described for Alternative 1.
- The actions to improve access might foster an increase in recreation use along riparian areas, favored as picnic and camping sites by vehicle-based users. Recreation would reduce tree, shrub, and herbaceous cover for about 1/4 mile up and downstream from each access point. Loss of plants would decrease cover for riparian birds and might harm the Southwestern willow flycatcher. Proposed camping restrictions in riparian areas and closure of most riparian road crossings would reduce the potential for these impacts.

### Road Designations

Alternative 2 would limit motor vehicle use to designated roads and keep 93.9 **91.9** miles of road open to recreational use. BLM would modify recreation use on 34.6 **35.3** miles of road by designating them for administrative use only or by converting them to non-motorized trails. BLM would close and rehabilitate 16 **13.7** miles of road, representing ~~2~~ **10**% of the planning area's total road network on public lands. Alternative 2 would result in a high level of recreation use throughout the planning area. Closing roads would reduce impacts to wildlife, but converting roads to trail use or designating roads for administrative use is not likely to greatly alter impacts to wildlife.

The closing of ~~14~~ **10**% of the road network would reduce vehicle-related wildlife impacts described for Alternative 1. Unless travel increases dramatically on roads that are open, wildlife traffic deaths might be lower than under Alternative 1 due to road closures and restrictions. Less road access would also slightly reduce opportunities for poaching. Road closures and restrictions, coupled with the

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designated road system, would reduce opportunities for unauthorized off-road travel and allow BLM to more easily detect and enforce unauthorized travel.

In grassland habitat, pronghorn would benefit from the seasonal closure of Road Canyon to vehicles. But increased use of South Road between Highway 82 and Road Canyon might increasingly disturb pronghorn. Vehicle-based recreation would also curtail the use of Oak Tree Canyon as a movement and dispersal corridor.

Alternative 2 might cause slightly less disturbance to agave stands and slightly less soil compaction than would Alternative 1 and slightly less affect the agave plant, which provides an important food source (nectar and pollen) for the endangered lesser long-nosed bat during migration.

Under Alternative 2, BLM would close to vehicle use all but one riparian road crossing **perennial section of** on Cienega Creek. The impact to vegetation and wildlife would be about 40% less under Alternative 2 than under Alternative 1. Alternative 2 would also slightly less affect the Southwestern willow flycatcher than would Alternative 1.

### Recreation Management

Designating recreation zones would slightly affect upland wildlife under Alternative 2. These designations relate to recreation opportunities and involve access, road conditions, developments, and quality of experience. Most of the planning area would be designated Zone 3, which is close to existing conditions. Therefore, zone prescriptions under Alternative 2 would not greatly alter the impacts of recreation discussed in previous sections. Since all-terrain vehicles, off-highway vehicles, and other four-wheel drive vehicles can access all zones, the impacts from motor travel would be as previously discussed and would not

change from one zone to another.

In Zone 1, recreational impacts from camping would cease because camping would not be permitted. Developing the ranch headquarters and increased vehicle use on the entrance road could have moderate to high effects on wildlife. These effects would include vehicle impacts, as described in the off-highway vehicle section above, and disturbance and displacement of wildlife in response to increased activity.

In Zone 2, recreational impacts from camping and group use would be concentrated in designated areas rather than dispersed throughout the zone. Zone 2 would consist of about 7% of the planning area. This amount would be a slight improvement from Alternative 1, which proposes no recreation zones.

In Zone 3 (44,387 acres), BLM would not restrict camping to designated areas and would allow dispersed camping. Recreational use would be more diffuse, and impacts would be the same as under Alternative 1 for 90% of the planning area.

~~Under the activity plans for Alternatives 2, 3, and 4, the following impacts would be expected from the recreation proposals~~ **management actions:**

- Establishing a permit system could directly, indirectly, or cumulatively affect wildlife or wildlife habitat. The permit system could help ensure that visitor levels are consistent with sustaining wildlife habitats and populations.
- A fee program option could benefit wildlife by providing funding to mitigate recreation impacts on wildlife. The fee program could also deter some visitors from using the area in the short-term. In the long-term, gradual acceptance of a fee system would probably no longer depress visitation levels.

## *Impacts to Terrestrial Wildlife from Alternative 2*

- Acquiring a special land use permit from the Arizona State Land Department would have slight direct, indirect, or cumulative impacts on wildlife or wildlife habitat.
- Developing an interpretive and educational plan would have slight direct, indirect, or cumulative impacts on wildlife or wildlife habitat. Wildlife-related education might have a slight, beneficial, indirect impact. Some people might voluntarily curtail detrimental activities in response to knowledge gained from BLM's education efforts.
- Developing a recreation maintenance plan would not directly, indirectly, or cumulatively affect wildlife or wildlife habitat. But maintenance activities could temporarily displace wildlife species, or result in localized short-term disturbance or loss of habitat.

The activity plan for Alternative 2 **management actions** would have several impacts.

Designating three group sites and five designated camping areas would increase trampling, fuel wood cutting, clearing, and loss of vegetation cover in these areas within Zone 2. Designations would cause recreation impacts to concentrate around each site. At these sites, species such as Mearn's quail, Baird's sparrow, grasshopper sparrow, and other birds that prefer high percentages of native grass and forb cover would decline in number. Because of high levels of activity by visitors and pets, ungulates and other large species would tend to avoid these areas. Pronghorn use, for example, near the southern group sites or camp areas would be expected to decline.

Establishing permanent group sites and designated camp areas would increase human refuse and food waste if visitors do not adhere to Leave No Trace principles. Any substantial levels of refuse and waste would attract

colonization by nonnative birds such as starlings and house sparrows. These birds could out compete native cavity-nesting birds (e.g., acorn woodpecker, American kestrel, ash-throated flycatcher) in and around these sites causing local declines in native bird species. Any substantial increases in human refuse in and around designated camp areas would increase food sources for deer mice, house mice, and native scavengers, such as the striped skunk and common raven. The coyote, a generalist predator/scavenger, would benefit from increased rodent numbers and increased refuse (a food source).

The above mentioned impacts might be less when organized groups use the sites. Typically, these groups would abide by BLM stipulations and clean up most refuse. To do otherwise could result in cancellation of their permit and exclusion from future use.

Soil compaction at these sites would increase bare ground, which would favor such wildlife species as horned lark, cowbird, and Brewer's blackbird.

### Arizona Trail

Under Alternative 2, a total of 11.6 miles of new trail would be built most within ½ to ¼ mile of existing roads. Four miles would be built close to the riparian zones of Empire Gulch and Cienega Creek. The remainder would be built in upland habitats.

Trail building would disturb some surface and destroy vegetation. These effects are discussed in the off-road vehicle management and road designation sections of Alternative 1 Impacts to **Terrestrial** Wildlife. Trail building and use might trample or reduce some stands of agave. Because of the trail's closeness to existing roads, where the degree of disturbance to wildlife and habitat is already high, the increase in recreational disturbance to wildlife would be less than under Alternative 1.

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Because of the closeness of the Arizona Trail to riparian habitats, it is inevitable that considerable recreational activity would occur in the riparian zone because of the shade and reduced temperature afforded within the tree canopy. Recreational camping would inevitably reduce some vegetation cover despite restrictions on camping in riparian areas, trail riding along the stream banks, and activity in the stream itself. Recreation would also disturb breeding birds and their habitat. This loss of cover and disturbance could affect the Southwestern willow flycatcher, ~~if it breeds in the area in the future~~ by the following: Frightening birds away from nests.

- Trampling vegetation cover that shelters birds from the elements.
- Cutting or breaking down trees that harbor nests or resting cover.

The trail would increase horse use, bare ground, and seed-bearing manure along the riparian area. These changes could improve foraging conditions for the brown-headed cowbird. They might also lead to increased opportunities for nest parasitism and reduced breeding success for the Southwestern willow flycatcher and other breeding birds, including the yellow-billed cuckoo, yellow warbler, and Bell's vireo under high levels of use.

As the Arizona Trail becomes publicized and widely known, more visitors would use the area. Hence the effects of human disturbance to wildlife and habitat under Alternative 2 would be greater than under Alternative 1, which would not designate a route for the trail.

##### Livestock Grazing

Under Alternative 2, livestock would graze 42,155 acres of grassland and oak woodland habitats on public lands. This area is 300 acres more than under Alternative 1. The remaining 3,919 acres would be contained within

enclosures.

Because Alternative 2 proposes a totally flexible stocking rate and cattle would graze State Trust Lands or private lands during portions of the year, the number of livestock on public land at any one time would vary widely. According to the examples of a flexible stocking rate that could be implemented for Alternative 2 under different rainfall regimes (See Chapter 2, Tables 2-21, 2-22, and 2-23), the stocking rate on public lands could vary from 861 cattle year long to 349 cattle year long. Over a year with high rainfall, for example, an amount of livestock use equal to 10,332 animal unit months (or 861 cattle per year) would occur on public lands. Table ~~4-1~~ **4-2** (compiled from information in Tables 2-21, 2-22, and 2-23) shows the amount of forage that livestock would consume on public lands under high, normal, and low rainfall regimes.

Under Alternative 2, livestock would graze 64,649 acres of grassland and woodland habitat on State Trust Land, the same amount as under Alternative 1. If stocking rates are as varied as they are on public lands based on input from the Biological Planning Team, from 519 to 1,209 cattle could be present on State Trust Lands. Table ~~4-2~~ **4-3** (compiled from information in Tables 2-21, 2-22, and 2-23) shows the amount of forage that livestock would consume on State Trust Lands under high, normal, and low rainfall regimes.

Table ~~4-3~~ **4-4** (compiled from information in Table 2-24) shows the amount of forage that livestock would consume for all allotments combined in the high, normal, and low rainfall regimes under Alternative 2. As under Alternative 1, adjustments in livestock numbers would result in the percent of ~~available~~ **useable** forage consumed remaining fairly constant, **leaving an adequate reserve of forage for unexpected events.**

Tables 4-2, 4-3, and 4-4 represent a simplified model of the relationship of forage production and livestock consumption and assume that forage consumption by livestock is at a

relatively constant rate under all conditions. The actual relationships are more complex, but the tables were developed to provide for comparison of the different grazing strategies

**Table 4-1 4-2**  
**Forage Consumed by Livestock on Public Lands in the Planning Area**  
**Under Three Rainfall Regimes**  
**Alternative 2, Las Cienegas RMP**

Rainfall Regime <sup>1</sup>	Cattle Year-Long	Million Pounds of Forage Consumed/Year	% of Total Production Consumed	% of Available Useable <sup>2</sup> Forage Consumed (at 35% utilization limit)
High (Favorable)	861	8.3	11.8	67
Normal	520	5.0	10.7	61
Low (Unfavorable)	349	3.4	11.0	63

<sup>1</sup> The "favorable, normal, and unfavorable" years are mainly a reflection of rainfall. This variable is used to show that production varies greatly in response to the amount and timing of precipitation, and how different livestock stocking rates affect the amount of vegetation cover remaining to achieve the watershed and wildlife objectives in the plan. In a Favorable Year, the assumed average production is 1800 lbs/ac and 0.25 AUM/ac on the Empire, Rose Tree, and Vera Earl ranches on the basis of NRCS Ecological Site Guides, and 1200 lbs/ac and 0.18 AUM/ac on the Empirita and Empire Mountain grazing units. In a Normal Year, the assumed average production is 1200 lbs/ac and 0.15 AUM/ac on the Empire, Rose Tree, and Vera Earl allotments based on NRCS Ecological Site Guides, and 800 lbs/ac and 0.12 AUM/ac on the Empirita and Empire Mountain grazing units. In an Unfavorable Year, the assumed average production is 800 lbs/ac and 0.10 AUM/ac on the Empire, Rose Tree, and Vera Earl ranches on the basis of NRCS Ecological Site Guides, and 500 lbs/ac and 0.09 AUM/ac on the Empirita and Empire Mountain grazing units.

<sup>2</sup> In this example, the useable forage is assumed to be 50% of the total vegetation produced multiplied by the 35% utilization rate on lands allocated for livestock grazing. The formula for determining useable forage, where V is total vegetation production and U is useable forage is  $U = [(V \times 0.50) \times 0.35]$ . The percentage of allocated forage consumed remains fairly constant under this management strategy. (Note that the remaining 50% of the total production, that was subtracted initially is left to provide for rangeland health as cover left for watershed values). Thus in Table 4-1 in a favorable year, the useable forage represents only about 18% of the total vegetation production. Livestock consuming 67% of the useable forage are therefore consuming only about 11% of the total production.

**Table 4-2 4-3**  
**Forage Consumed by Livestock on State Trust Lands in the Planning Area**  
**Under Three Rainfall Regimes**  
**Alternative 2, Las Cienegas RMP**

Rainfall Regime	Cattle Year-Long	Million Pounds of Forage Consumed/Year	% of Total Production Consumed	% of Available Useable Forage Consumed (at 35% utilization limit)
High (Favorable)	1,209	11.6	10.9	62
Normal	750	7.2	10.2	58
Low (Unfavorable)	519	5.0	10.7	61



**Table 4-3 4-4  
Forage Consumed by Livestock on All Allotments in the Planning Area  
Under Three Rainfall Regimes  
Alternative 2, Las Cienegas RMP**

<b>Rainfall Regime</b>	<b>Cattle Year-Long</b>	<b>Million Pounds of Forage Consumed/Year</b>	<b>% of Total Production Consumed</b>	<b>% of available useable Forage Consumed (at 35% utilization limit)</b>
High (Favorable)	2,110	20.3	11	64
Normal	1,295	12.4	10	60
Low (Unfavorable)	887	8.5	10	62

across alternatives. Although the data in the tables is based on a simplified model, the tables illustrate the potential resource benefits of making adjustments in stocking rates based on resource conditions. These benefits include relatively constant reserves of vegetation production for watershed and wildlife values under varying levels of annual vegetation production.

Also, as under Alternative 1, trampling would reduce more vegetation cover. The loss of cover to trampling might be slightly higher or lower depending on the number of livestock present. This number would vary from year to year. But the impacts of concentrated use around stock tanks would be similar to those under Alternative 1, since these impacts have accrued over the years of use and do not change much in the short-term.

Under Alternative 2, operations could stock slightly more cattle (29) than under Alternative 1, but on 300 more acres but under this alternative actual stocking is based on monitoring of the actual forage produced the previous year, and on health of the plants, rather than on the opportunity to just stock numbers at the maximum allocated level. In normal and particularly unfavorable (low rainfall) years, the

numbers stocked per acre would probably track should reflect the available actual useable forage, better than under Alternative 1 because the stocking rates would be based on more extensive monitoring data.

The potential for reduced cover and forage (based on the potential for livestock forage removal) for grassland wildlife species, such as Baird’s sparrow, pronghorn, and grasshopper sparrow under Alternative 2 would stay about the same from year to year as the stocking rate is adjusted. The amount of cover removed under Alternative 2 could be slightly higher or lower than under Alternative 1, depending on the year and the amount of rainfall. This amount is difficult to determine because of the wide variability in potential livestock use.

The potential for reduced cover and forage (based on the potential for livestock forage removal) for oak woodland species, such as Mearn’s quail, white-tailed deer, and bunchgrass lizard under Alternative 2 would stay about the same from year to year as the stocking rate is adjusted. The amount of cover removed under Alternative 2 could be slightly higher or lower than under Alternative 1, depending on the year and the amount of rainfall. This amount is difficult to determine

## *Impacts to Terrestrial Wildlife from Alternative 2*

because of the wide variability in potential livestock use.

The potential for livestock to remove more than 55% by weight of available useable forage and reduce local Mearns's quail populations would be slightly less than under Alternative 1, because the allowable utilization range would have been lowered from 40-60% to 30-40%. Monitoring would be needed to ensure that utilization meets this range. The potential for livestock to affect the white-tailed deer's use of the habitat would also be slightly less than under Alternative 1, because of the lowered allowable utilization range.

The potential under Alternative 2 for livestock consumption of growing agave stalks would be slightly less than under Alternative 1. Some livestock (i.e., bulls) would still be present on ecological sites that support most agave populations when stalks are first bolting. If the Biological Planning Team recommends that the agave stand receive total rest from grazing and if the livestock users agree, the lesser long-nosed bat, which feeds on nectar and pollen from agave blossoms, would be less harmed than under Alternative 1.

Livestock grazing under Alternative 2 would affect the Southwestern willow flycatcher and other riparian birds less than under Alternative 1, **as upland water developments result in conversion of some watering areas along Cienega Creek to lanes.** An additional 520 acres of riparian areas would be excluded from livestock grazing, in addition to the 659 acres already excluded. Attracted to riparian areas by abundant forage, shade, and water, livestock would continue to consume and trample vegetation at watering points and livestock crossings as described for Alternative 1. ~~The addition of two~~ Livestock crossing lanes will disturb ~~an additional~~ **about the same** acreage of riparian vegetation.

Conditions created by livestock would continue to attract cowbirds. Cowbirds would continue to be present and have the potential to parasitize songbird nests, including those of willow flycatchers (~~should this species attempt to nest in the area~~). ~~No nesting flycatchers have been recorded in the area, but the area has not been thoroughly surveyed~~ **Only one flycatcher nest was located in the 2001 survey and it successfully fledged at least one flycatcher with no evidence of cowbird parasitism (BLM files). The sample size is too small to determine what effect cowbirds may have on nesting flycatchers in the planning area.**

Alternative 2 proposes exclosures for 2,740 more acres outside riparian zones. Exclosures might slightly but directly benefit upland species, particularly smaller species that could use the protected habitats and increased cover within them. Some of the exclosures would be too small and confining to directly benefit species with large ranges, such as pronghorn. But exclosures might have more substantial long-term indirect impacts for upland species from: (1) their use as comparison sites for a better understanding how grazing affects upland wildlife habitats, and (2) later management responses through the use of this information in the biological planning process.

Roads needed for livestock operations are provided within the existing road network under Alternative 1, as well as the designated road network under Alternative 2. BLM determined that no new roads would be needed, although Alternative 2 would designate some roads used for livestock operations for administrative use only. Therefore, Alternative 2 would result in no net change from Alternative 1 in disturbance from the use of these roads for livestock operations.

Despite the potential for slightly higher livestock use under Alternative 2 than under Alternative 1, the biological planning process

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could increase population viability and habitat quality for some wildlife. In addition, it is a process for adjusting livestock grazing (and recreation use) to address and resolve issues that are raised for wildlife species. Monitoring for habitat and species would be more intensive than under Alternative 1, **as a result of implementing an ecological monitoring program** and might allow for more effective detection of habitat and population declines. The Biological Planning Team would use the monitoring data **as a basis for** changing management to try and reverse these declines. For example, if habitat conditions for pronghorn, Baird's sparrow, grasshopper sparrow, and Botteri's sparrow **continue to decline** despite the implementing of management actions, monitoring could provide clues as to further corrective actions.

The added monitoring of the biological planning process under Alternative 2 would help assess grazing (and recreation) impacts on selected species. Evidence of significant increases in habitat quality or in wildlife populations tied to changes in livestock management is lacking under current management due to limited monitoring data.

Existing data suggests that some wildlife populations (pronghorn and mule deer, for example) are in a state of prolonged decline throughout Arizona. The cause of this decline is **subject to speculation likely a result of a combination of factors including habitat loss from housing development; fragmentation of habitat by roads, fences, and other developments; and habitat alterations including invasion of shrubs.** The AGFD is initiating a pronghorn study in 2002 which should help answer some of the management questions surrounding the pronghorn populations in this area. **Habitat for some of the larger wildlife species such as these needs to be managed on a watershed or landscape scale. The emphasis on collaboration and partnerships in the watershed and on biological planning under Alternative 2**

**should aid in a more landscape-based approach to habitat management for these species.**

### **From Special Designations**

#### *Areas of Critical Environmental Concern*

Alternative 2 would designate the entire planning area as an ACEC. Since the ACEC plan is the same as the ~~interdisciplinary activity~~ plan for Alternative 2, the management actions and their impacts on terrestrial wildlife are those discussed previously under impacts of Alternative 2 on terrestrial wildlife.

#### *Cumulative Impacts—Alternative 2 on Terrestrial Wildlife*

Because of continuing economic pressure to subdivide and develop private land, much private land in and around Sonoita/Elgin is likely to be developed as residences and businesses, despite the BLM's collaborative efforts. Roads, fences, and human disturbance would still increase, especially near the southern and western edges of the planning area although perhaps less than under Alternative 1.

Under Alternative 2 some private land holders might decide to resist the economic incentive and continue ranching. Some adjacent undeveloped private lands, along with the public lands and State Trust Lands, would continue to provide habitat for grassland wildlife species such as grasshopper sparrow and Baird's sparrow. But invading nonnative birds found near human development and habitation, such as starlings and house sparrows, could still compete with wintering Baird's sparrows and breeding grasshopper sparrows. These species might be able to better coexist than under Alternative 1 because of the presence of undeveloped private lands.

The public lands in the planning area, along with some adjacent undeveloped, private lands, could become a refuge for many grassland

wildlife species such as grasshopper sparrow and Baird's sparrow.

High-quality pronghorn habitat on public land is limited within the planning area. Quality habitat on State Trust and private lands is important to the survival of the herd. Maintenance of a sustainable pronghorn herd would be doubtful, as under Alternative 1, because of human encroachment and changes in habitat quality on **surrounding** private lands (which are vital to pronghorn survival). Increased recreation use, domestic dogs, and other pressures would also restrict pronghorn from moving about and occupying otherwise suitable habitat.

These pressures would steadily increase and might eventually reach a level at which a self-sustaining pronghorn herd could not persist. For example, increased fences and homes have severely curtailed pronghorn movement from the Babocomari Ranch to public lands north of Elgin Road. These forces may have confined pronghorn to a 1,200-acre patch of public lands south of Highway 82.

Studies of pronghorn by Ockenfels et al. (1994) suggest that this patch might not ensure long-term viability of pronghorn unless movement corridors can be maintained or, in some cases, re-created. A viable herd might be maintained if cooperative private landowners preserve enough tracts of quality grassland habitat with movement corridors connecting them to public lands. Alternative 2 would be more likely than Alternative 1 to maintain such tracts, but Alternative 2 might not succeed.

Species inhabiting oak woodland habitats, such as Mearn's quail, white-tailed deer, and bunchgrass lizard, would be subject to less pressures on remaining public land than under Alternative 1. Unlike pronghorn, white-tailed deer are somewhat more compatible with high levels of human disturbance and would probably persist as under Alternative 1.

Despite actions proposed by Alternative 2, increased human occupation; fence construction; road building; and other alterations of habitat on private, State Trust, public, and national forest land would restrict important movement corridors. Wide-ranging species such as jaguar, mountain lion, black bear, mule deer, Gould's turkey, and coatimundi might have a few more movement corridors open to them under Alternative 2 than under Alternative 1, but human-wildlife encounters would continue to increase.

Under Alternative 2, the likelihood of achieving the wildlife objectives would still be doubtful, though less so than under Alternative 1. Enough movement corridors would be slightly more likely to remain under Alternative 2 than under Alternative 1 to permit the maintenance of biological diversity desired in the objective. As under Alternative 1, the high levels of human use likely under Alternative 2 would increase the difficulty of maintaining viable wildlife populations and successfully recovering and reestablishing species.

Upland species might still decline due to impacts outside public lands in the planning area. For example, Baird's sparrow, which migrate in summer, might decline due to habitat alterations on its summer range.

Several adjustments in livestock management might also be needed to maintain the levels of vegetation cover desired in the objectives. With enough monitoring data to support these adjustments, Alternative 2 might be more likely than Alternative 1 to make the modifications to achieve the desired vegetation objectives. But these vegetation objectives might not translate into population increases of priority species.

The vegetation treatment program, collaboratively implemented under Alternative 2, could improve habitat conditions for grassland species on public lands and

surrounding lands through cooperative projects. Under Alternative 2, the Southwestern willow flycatcher would continue to use the riparian habitat along Cienega Creek during migration **and possibly breeding**. This area has been documented as an important migratory stopover for many neotropical migratory bird species (Krueper 2000). **In 2001, an adult willow flycatcher feeding a fledgling near a willow flycatcher nest was found along Cienega Creek during willow flycatcher surveys. Continued monitoring in future years is needed to determine if flycatchers continue to use Cienega Creek for breeding and if use expands.**

Excluding more riparian acres from livestock use than Alternative 1, Alternative 2 would present a slightly higher probability than Alternative 1 that Southwestern willow flycatchers would **continue to** nest in the area.

Under Alternative 2, livestock would consume some agave, and numbers of agave would decrease along rights-of-ways and roads, in prescribed fire units, and around recreation facilities. This loss of agave would negligibly affect the lesser long-nosed bat.

**Under Alternatives 2, 3, and 4 the implementation of the proposed Las Cienegas Acquisition Strategy (Appendix 2) could result in the protection from development of significant tracts of State Trust and private lands within the planning area. If this occurs and is combined with the other management strategies under Alternative 2, then it will be much more likely that wildlife objectives are achieved, that more wildlife movement areas are preserved and that the viability of more fish and wildlife populations are assured over the longer term.**

### ***Impacts to Terrestrial Wildlife from Alternative 3***

#### **From Desired Resource Conditions**

##### *Watershed, Fish and Wildlife, Visual and Cultural Resource Management*

Impacts under Alternative 3 would be the same as under Alternative 2.

#### **From Land Use Allocations**

##### *Mineral Development*

Mineral development under Alternative 3 would affect wildlife and wildlife habitats much as would Alternative 1 but over a potentially much larger area. No estimate of disturbed acres is possible because there are no credible estimates of the number of mines and gravel pits that might be developed. The planning area might have limited potential for new mineral discoveries.

Clearing vegetation and topsoil for the pits, stockpiles, roads, ancillary facilities, storage sheds, offices, housing, parking, and loading areas would destroy and degrade wildlife habitat. Extracting locatable, salable, or leasable minerals would disturb the surface. The level of impacts described for Alternative 1 could be greater under Alternative 3, because Alternative 3 would open more acreage to mineral exploration and development.

Mineral extraction under Alternative 3 would disturb or degrade an undetermined amount of grassland habitat and directly disturb such grassland wildlife as Baird's sparrow, pronghorn, grasshopper sparrow, and bunchgrass lizard. Mineral extraction under Alternative 3 would also disturb an

### *Impacts to Terrestrial Wildlife from Alternative 3*

undetermined amount of oak woodland habitats and eliminate or degrade habitat for such species as the Mearns quail, white-tailed deer, and alligator lizard. Mining would disturb agave, which grows in scattered clumps in both woodland and grassland and might harm the lesser long-nosed bat, which feeds on nectar and pollen from agave blossoms.

Under Alternative 3, a total of 4,859 acres of riparian habitat within the Nogales Spring and Cienega Creek Areas of Critical Environmental Concern (ACECs) would not be subject to many of the impacts that could result from the mining of salable or locatable minerals. These ACECs would still be subject to many of the same impacts under leasable mineral exploration and development. But the development potential of such leasable minerals as oil, gas, and thermal energy is not known to be great.

#### Utility Rights-of-Way and Land Use Authorizations

The impacts of utility rights-of-way and land use authorizations on upland wildlife under Alternative 3 would be the same as under Alternative 2 with the following exception: An additional right-of-way corridor would parallel Highway 82 for underground utilities. Surface disturbance would result in loss of native grass species and potential for replacement with nonnative species, such as Johnson grass, Lehmann lovegrass, and Russian thistle. This loss would slightly reduce the suitability along the roadside for native birds, such as Baird's sparrow and grasshopper sparrow, but would improve habitat for nonnative species such as starlings and house sparrows.

#### Off-Highway Vehicle Management

Impacts would be the same as under Alternative 2.

#### Road Designations

Alternative 3 would convert 7.6 6.8 miles of road to trails and close 11.4 9.8 miles of road.

The miles of closed roads would make up 87% of the planning area's current road network on public land. These adjustments would not substantially alter the impacts discussed for road designations under Alternative 1.

#### Recreation Management

The designation of recreation zones under Alternative 3 would affect upland wildlife much as under Alternative 2. But Alternative 3 would include a greater area in Zone 2, where impacts of camping and group events would be restricted to designated sites. Under Alternative 3, Zone 2 would consist of nearly 17,000 acres, more than four times as large as Zone 2 under Alternative 2. Extensive, dispersed use would therefore disturb less wildlife, and localized concentrated use would inflict slightly more disturbance. Most of the area would still be in Zone 3, which would be similar to existing management in impacts to wildlife.

Alternative 3 would designate two additional group sites and one additional camp area than would Alternative 2. Therefore, the impacts of these concentrated use areas, as described for Alternative 2, would be extended to these additional areas. These additional areas are within grassland habitats and would most harm species inhabiting open grasslands.

Under Alternative 3, the two additional group sites would be in pronghorn habitat. Pronghorn tend to flee further from disturbance than other ungulates, so concentrated use areas more affect them. Pronghorn use near these sites would decline in response to the sites' occupation by visitors with pets.

#### Arizona Trail

Under Alternative 3, the Arizona Trail would affect terrestrial habitat and wildlife species the same as under Alternative 2.

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### Livestock Grazing

Under Alternative 3, livestock would graze ~~43,895~~ **45,375** acres of grassland and oak woodland habitats on public lands. BLM would permit livestock use equal to 5,832 animal unit months or 486 cattle per year on public lands in the planning area. This is less livestock use than would potentially occur under either Alternative 1 or 2 in normal and above-average rainfall years. At this stocking level, these animals would consume an average of 4 million pounds (dry weight) of vegetation material per year. The 486 cattle would be consuming 34% of **available useable** forage in a favorable (high rainfall) year, 52% of **available useable** forage in a normal rainfall year, and 78% of **available useable** forage in an unfavorable (low rainfall) year.

Under Alternative 3, livestock would graze 64,649 acres of grassland and woodland habitat on State Trust Land. Over the course of a year, an amount of livestock use equal to 7,932 animal unit months or 661 cattle per year would occur on State Trust Lands in the planning area (See Chapter 2, Table 2-28). This use would remove, on average, 6.3 million pounds of forage per year from State Trust Lands. The 661 cattle would be consuming 32% of **available useable** forage in a favorable (high rainfall) year, 48% of **available useable** forage in a normal rainfall year, and 72% of **available useable** forage in an unfavorable (low rainfall) year.

**Available Useable** annual vegetation production would vary between 14 million and 33 million pounds on all allotments combined in the planning area. Livestock would consume an average of 11 million pounds of forage per year or between 34 and 78% of the **available useable** forage, depending on the production (See **Table 4-5** and Chapter 2, Table 2-29).

In a series of years with less than the mean annual rainfall, the goals and objectives in this

plan for vegetation and wildlife would probably not be met, even with this conservative level of livestock grazing. In such a situation, BLM would not meet the standards required in the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (See Appendix 2). BLM would systematically implement and monitor the modification to the livestock grazing regime (including reduced numbers of cattle, until meeting the objectives. Since Alternative 3 would not apply the Biological Planning Team approach, this process of monitoring and adjustment could take several seasons before the livestock grazing is brought into balance with the capacity of the range and the rangeland standard is attained.

Under Alternative 3, livestock would graze most grassland habitats. Alternative 3 would result in potentially less loss of cover on public lands in most years (due to the lower livestock use levels) for grassland wildlife such as Baird's sparrow, pronghorn, and grasshopper sparrow than would Alternatives 1 or 2. Habitat conditions for species that prefer bare ground, such as horned larks, black-tailed jackrabbit, and meadow larks, would not increase much.

Livestock would graze most oak woodland habitats under Alternative 3, which in most years would have less potential than Alternative 1 or 2 to reduce habitat components (mainly cover) for such species as bunchgrass lizard, Mearn's quail, and white-tailed deer.

Under Alternative 3, livestock would consume slightly fewer growing agave stalks than under Alternatives 1 or 2 in most years due to the conservative stocking rate. But as under Alternatives 1 and 2, the impact on foraging habitat for the lesser long-nosed bat--which feeds on nectar and pollen from agave blossoms--is expected to be negligible.

Under Alternative 3, BLM would exclude 699 acres of Cienega Creek and Empire Gulch from

**Table 4-5  
Forage Consumed by Livestock on All Allotments in the Planning Area  
Under Three Rainfall Regimes  
Alternative 3, Las Cienegas RMP**

<b>Rainfall Regime</b>	<b>Cattle Year-Long</b>	<b>Million Pounds of Forage Consumed/Year</b>	<b>% of Total Production Consumed</b>	<b>% of useable Forage Consumed (at 35% utilization limit)</b>
High (Favorable)	1,175	11.3	6	34
Normal	1,175	11.3	9	52
Low (Unfavorable)	1,175	11.3	14	78

livestock grazing. Cattle would still have access to small amounts of riparian area at livestock crossing lanes, and in portions of Empire Gulch, Gardner Canyon, Cinco Ponds, **and at Cienega Creek near the Narrows and in the A & B pastures north of the Agricultural Fields, and Nogales Spring.** The impact of this livestock use on the Southwestern willow flycatcher and other riparian birds would be the same as under Alternative 2.

The impacts of the 14 planned livestock developments would be the same as described for Alternative 2.

Roads needed for livestock operations are provided within the existing road network under Alternative 1 and the designated road network under Alternatives 2 and 3. BLM found no new roads were needed, but would designate some roads used for livestock operations for administrative use only under Alternatives 2 and 3. Therefore, BLM expects no net change in disturbance from livestock operation use of these roads under Alternatives 1, 2, or 3.

Stocking rates under Alternative 3 (by applying BLM’s standards and guidelines policy) would be adjusted more slowly than under Alternatives 1 or 2. But over the long term, livestock grazing management under Alternative 3 would achieve

vegetation and wildlife habitat objectives.

**From Special Designations**

*Areas of Critical Environmental Concern*

Alternative 3 would designate two ACECs: Cienega Creek ACEC and Nogales Spring ACEC. Both consist of riparian areas, and their designation and management would not greatly affect upland wildlife. For analysis of the impacts of actions proposed under the ACEC plans for Cienega Creek and Nogales Springs, see Impacts to Terrestrial Wildlife from watershed, upland, and riparian actions under Alternative 2.

***Cumulative Impacts to Terrestrial Wildlife from Alternative 3***

The cumulative impacts of Alternative 3 would be the same as **similar to those** under Alternative 1. However, **as under Alternative 2, the implementation of the proposed Las Cienegas Acquisition Strategy (Appendix 2) could result in the protection from development of significant tracts of State Trust and private lands within the planning area. If this occurs and is combined with the other management strategies under Alternative 3, then it will be more likely that wildlife objectives are achieved, that additional wildlife movement areas are preserved and that the viability of additional fish**



**and wildlife populations are assured than under Alternative over the longer term.**

The likelihood of achieving the wildlife objectives would also be about the same as under Alternative 1.

### ***Impacts to Terrestrial Wildlife from Alternative 4***

#### **From Desired Resource Conditions**

##### Watershed, Visual and Cultural Resources Management

Impacts under Alternative 4 would be the same as under Alternative 2.

##### Fish and Wildlife Management

The impact of wildlife management under Alternative 4 would be substantially the same as under Alternative 2. But the more restrictive management environment on public lands under Alternative 4 would greatly enhance the potential to maintain habitat quality, reduce habitat loss, and maintain viable wildlife populations on the 49,000 acres of public lands in the planning area. With less emphasis on collaboration, BLM could more quickly make management decisions. But BLM's limited potential for input on decisions for surrounding lands could have far-reaching impacts on wildlife. The impacts on the 120,000 acres of state and private lands could be substantial if these lands are developed and the areas are lost as habitat for many species (See Cumulative Impacts section below).

#### **From Land Use Allocations**

##### Mineral Development

Mineral development under Alternative 4 would affect wildlife the same as under Alternative 2.

##### Utility Rights-of-Way and Land Use Authorizations

Utility rights-of-way and land use authorizations under Alternative 4 would affect upland wildlife

the same as under Alternative 2, except that rights-of-way would be limited to one designated corridor rather than two.

##### Off-Highway Vehicle Management

Impacts under Alternative 4 would be the same as under Alternative 2

##### Road Designations

Alternative 4 would designate ~~86.8~~ **83.9** miles of road for motorized recreation use, restrict ~~28.5~~ **30.2** miles of road to administrative use, and close and rehabilitate ~~27.6~~ **25.5** miles of roads. The road closures would represent ~~20~~ **19**% of the planning area's road network on public lands. Therefore, impacts to wildlife from motorized recreation could greatly decline. By not converting roads to non-motorized trails, BLM would eliminate the potential of added impacts from nonmotorized recreation.

A high level of recreation use throughout the planning area can still be expected under Alternative 4, and impacts projected for Alternative 1 from motorized recreation (both authorized and unauthorized use) would still occur. Overall, the harm would be slightly less than under the other alternatives. Less vegetation cover would be lost. Agave stands might be slightly less disturbed and soil compaction slightly reduced from conditions under Alternative 1. Alternative 4 might also inflict slightly less harm on the endangered lesser long-nosed bat than would Alternative 1.

Under Alternative 4, BLM would close to vehicle use all but one riparian road crossing **the perennial reaches of** ~~on~~ Cienega Creek. The impact to vegetation and wildlife would be about 40% less under Alternative 4 than under Alternative 1. Motorized recreation under Alternative 4 would slightly less harm the Southwestern willow flycatcher than under Alternative 1, but recreation would still somewhat affect bird species and nesting cover.

### *Impacts to Terrestrial Wildlife from Alternative 3*

#### Recreation Management

The impacts on wildlife of designating recreation zones under Alternative 4 would not greatly differ from those under Alternative 2.

Alternative 4 would designate only one group site and four camp areas. Impacts from these concentrated use sites would be slightly less than under Alternative 2. But Alternative 4 would designate the most area in Zone 3, and impacts from dispersed recreation would be greater than under Alternatives 2 or 3 and the most like Alternative 1.

#### Arizona Trail

The impacts of the Arizona Trail on wildlife under Alternative 4 would be essentially the same as under Alternative 1, under which the Arizona Trail would not pass through the planning area.

Under Alternative 4, horse use is likely to increase along the riparian zone as a result of installing a nationally advertised trail. Increased bare ground and manure near the stream would increase **potential for** nest parasitism by cowbirds. Impacts to riparian birds, including the Southwestern willow flycatcher, would be as the same as under Alternative 2.

#### Livestock Grazing

Under Alternative 4, livestock would not graze 41,855 acres of public land that they now graze and livestock would not trample and reduce the vegetation cover on these acres. On average, 7 million more pounds of vegetation could be used for wildlife cover and forage needs on public lands than under Alternative 1; 3.4 to 8.3 million more pounds of vegetation than under Alternative 2, and 4 million more pounds of vegetation than under Alternative 3.

Under Alternative 4, livestock would still likely graze 64,649 acres of grassland and woodland habitat on State Trust Land. Over a year, an amount of livestock use equal to 13,776 animal

unit months (or 1,148 cattle per year) would occur on these lands.

This livestock use would remove 6.3 million pounds of forage per year from State Trust Lands. If a series of years occurs with less than mean annual rainfall, livestock operators would decide how to adjust livestock use, with some input from the State Land Department. BLM would not contribute to decisions for stocking rates on State Trust Land since it would no longer hold state grazing leases.

Operators are likely to adjust livestock use in response to forage availability, range condition, and livestock nutritional needs. The need to reduce impacts to sensitive habitats or wildlife species would probably not greatly influence stocking rate decisions on State Trust Lands. The result might be less grass cover on State Trust Land for sensitive upland species during years of low rainfall.

The ungrazed vegetation would provide more cover on public land than under other alternatives for grassland wildlife, improving habitat for Baird's sparrow, pronghorn, and grasshopper sparrow, and for oak woodland species such as the Mearns's quail, white-tailed deer, and bunchgrass lizard.

**Potential for** cowbird nest parasitism of Southwestern willow flycatcher and other riparian species would slightly decrease from that under Alternatives 1, 2, or 3 because no livestock waters would be built close to the riparian area.

Cowbirds have been known to fly up to four miles from feeding areas to engage in nest parasitism (Robinson et al. 1995). An estimated 25 residences are on private land within four miles of the riparian area. Most of these have horses (five or more per residence) or other livestock that produce forage conditions

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favorable for cowbirds. Hence, some parasitism is bound to occur under Alternative 4.

Riparian habitat under Alternative 4 would become less fragmented than under the other alternatives because no livestock crossings would be needed, and Southwestern willow flycatcher habitat would not be degraded by livestock use.

Alternative 4 would produce slightly more flowering agave stalks, providing nectar and pollen for the lesser long-nosed bat. Native ungulates (including pronghorn, deer, and javelina) would continue to consume agave stalks; thus, a percentage of stalks would fail to reach maturity.

The absence of livestock would reduce the need for some roads proposed for administrative use, under Alternatives 1, 2, and 3. BLM would close some of these roads for habitat restoration under Alternative 4 and maintain others for recreation use (see previous Road Designations section). Since livestock operators would no longer support road maintenance, some roads might decline in condition and be used less often. The result would be less road-related wildlife disturbance and mortality.

### **From Special Designations**

*Areas of Critical Environmental Concern*  
ACECs under Alternative 4 would have the same impacts as under Alternative 2.

### ***Cumulative Impacts—Alternative 4 on Terrestrial Wildlife***

As under other alternatives, most larger upland wildlife species depend on habitats outside the planning area. Loss of habitat or reduction in habitat quality on nonpublic lands and lands outside the planning area could still result in habitat loss and population declines despite actions taken under Alternative 4 for the public lands.

Because pronghorn need large amounts of space, the increase in cover and forage under Alternative 4 might not be enough to offset the loss of pronghorn habitat to private land development. Land owners might be less inclined to preserve open space and maintain livestock operations on private land, as might be the case under Alternative 2. As under Alternative 1, the loss of grassland habitat on private lands could lessen the viability of the pronghorn herd when combined with recreation pressure on the planning area's public lands. As a result, the pronghorn herd might not be able to sustain itself on the remaining fragmented public land tracts.

The planning area would likely become the sole refuge for many grassland wildlife species, such as grasshopper sparrow and Baird's sparrow, if surrounding and intermixed private or State Trust lands are developed. Wintering Baird's sparrows and breeding grasshopper sparrows would be subjected to potential competition from invading nonnative birds, such as starlings and house sparrows, that are attracted by human development and habitation. But this competition would be less than under Alternative 1. Despite exotic competition, the native species would probably be able to coexist due to the excellent grass cover remaining on public lands.

Species inhabiting oak woodland habitats, such as Mearns's quail, white-tailed deer, and bunchgrass lizard, would be subject to similar pressures on the remaining public land. But because of increased amounts of available ground cover these pressures would be somewhat less than under Alternative 1. Unlike pronghorn, white-tailed deer are somewhat more compatible with high levels of human disturbance and would probably increase in numbers more than under Alternative 1.

Under Alternative 4, the Southwestern willow flycatcher would continue to use the riparian

habitat along Cienega Creek during migration and possibly breeding. In 2001, an adult willow flycatcher feeding a fledgling near a willow flycatcher nest was found along Cienega Creek during willow flycatcher surveys. Continued monitoring in future years is needed to determine if flycatchers continue to use Cienega Creek for breeding and if use expands. The suitability of the riparian area for nesting by Southwestern willow flycatcher would increase more than under Alternatives 1, 2, or 3, due to lowered potential for nest parasitism and reduced habitat fragmentation.

Under Alternative 4, livestock would not consume agaves, but agaves would somewhat decline along rights-of-ways and roads and around recreational facilities. This agave loss would negligibly affect foraging habitat for the lesser long-nosed bat.

Under Alternative 4, the likelihood of achieving the wildlife objectives would still be doubtful but less so than under Alternatives 1, 2, or 3. Movement corridors between mountain ranges would still likely be constricted and eventually cut off, harming wide-ranging species such as jaguar, mountain lion, and black bear.

The levels of human use would probably still be high under Alternative 4, and recreation would continue to affect wildlife. The removal of livestock from public lands and elimination of grazing conflicts might allow for more successful recovery and reestablishment of species. They might also permit maintenance of viable populations of more species than under Alternatives 1, 2, or 3.

Since no livestock would be grazed, sufficient levels of vegetation cover are likely to be maintained to achieve the objectives. BLM would still need to monitor the public lands to determine the effect of management on wildlife populations. But BLM might more quickly change its management than under Alternatives

1, 2, or 3 since livestock grazing would not be an issue.

As under Alternatives 2 and 3, the implementation of the proposed Las Cienegas Acquisition Strategy (Appendix 2) could result in the protection from development of significant tracts of State Trust and private lands within the planning area. If this occurs and is combined with the other management strategies under Alternative 4, then it will be much more likely that wildlife objectives are achieved, that more wildlife movement areas are preserved and that the viability of more fish and wildlife populations are assured over the longer term compared with the other alternatives.

## **Impacts to Visual Resources**

**Scope of Analysis:** This section uses changes in the quality of visual resource conditions in the viewshed, particularly from prime viewing areas, to compare the impacts of the alternatives on visual resources.

### ***Impacts to Visual Resources from Alternative 1***

#### **From Desired Resource Conditions**

##### *Watershed: Upland, Riparian, and Aquatic Vegetation Management*

Some older vegetation treatment projects (e.g., cut stumps and pulled trees), from an era before BLM management, slightly intrude on visual resources. Creek restoration projects can create short-term visual intrusions due to restoration work. Scenic values are maintained by using visually non-intrusive rocks and materials. For project sites with cut vegetation, heavy equipment tracks and other disturbances are naturalized within 1-3 years of completion.

##### *Fish and Wildlife Management*

Existing fish and wildlife management would continue to cumulatively enhance scenic values.

## *Chapter 4: Biological Resources and Processes*

### Visual Resource Management (VRM)

In general, the planning area retains a high scenic value under current management. Perceptions differ on what standards should be used to determine quality. A VRM Class III designation could slightly and cumulatively degrade visual quality, if BLM allows major visually intrusive projects without the more restrictive Class II designation.

### Cultural Resource Management

Impacts from data recovery projects (i.e., archeological digs) are rare and do not significantly degrade high scenic values. If need be, areas can be naturalized or restored. BLM would develop the Empire Ranch headquarters to maximize viewsheds for visitors and to minimize added impacts from parking, access, and other facilities. BLM would keep the historical themes and settings during site design by using styles, colors, materials, and other architectural elements to reduce conflict.

### **From Land Use Allocations**

#### Mineral Development

Any major mineral development on the “seen” viewshed of the planning area, especially the Empire Mountains, could degrade current high scenic quality. The social and political impacts of visual intrusions created by mining in the region’s scenic areas are high. Impacts on visual resources could include: surface disturbance from road building, increased traffic, development of the mined site, and presence of equipment and structures.

#### Utility Rights-of-Way and Land Use Authorizations

Existing utility lines and developments requiring land use permits intrude on the quality of the visual resources, but they are not dominant features from the popular viewing areas. Random development and placement of new lines due to lack of designated corridors could

increase the degrading of scenic values. Lines designed to be non-intrusive over the landscape would not have as great a negative impact as other lines.

#### Off-Highway Vehicle Management

Under existing management, the perpetuation of existing wildcat roads and the unauthorized creation of new roads can reduce scenic quality. Some barricade methods also intrude on the quality of visual resources.

#### Recreation Management

Lack of recreation zones would not directly degrade visual resources if management repairs current impacts. But having no established zones indirectly allows for continual spread of hardened campsites--continually used areas where the ground becomes bare, surrounding vegetation is damaged, and fire rings and trash are evident.

#### Arizona Trail

Without the development of the Arizona Trail, visitors might create social trails, which would slightly degrade visual resources.

#### Livestock Grazing

Many livestock developments, including water holes, power poles, wells, tanks, and corrals, are within view of the main touring roads and slightly reduce high scenic qualities.

### **From Special Designations**

#### Areas of Critical Environmental Concern

Lack of ACEC designation under Alternative 1 might slightly reduce the resource protection emphasis that contributes to the planning area’s visual quality.

## ***Impacts to Visual Resources from Alternative 2***

### **From Desired Resource Conditions**

#### *Watershed: Upland, Riparian, and Aquatic Vegetation Management*

Some vegetation enhancement projects under Alternative 2 might temporarily or permanently intrude on the stricter standards of a Class II VRM designation.

#### *Fish and Wildlife and Cultural Resources Management*

Under Alternative 2, projects would need to conform to Class II VRM class standards, or mitigation would be required.

#### *Visual Resource Management (VRM)*

VRM Class II is the same classification required in many wilderness areas, where fewer alterations to the landscape can be allowed. This classification would ensure the mitigation of visual impacts from past and future grazing and recreation developments, major vegetation treatments, and wildlife enhancement projects that create structures or alter the landscape, thereby, benefitting the visual landscape.

### **From Land Use Allocations**

#### *Mineral Development*

Because Alternative 2 would virtually eliminate opportunities for mineral development, mineral development would not degrade visual resources.

#### *Utility Rights-of-Way and Land Use Authorizations*

Establishing a corridor in areas that do not dominate the viewshed and in conformance with Class II VRM prescriptions should retain high scenic values. Establishing a corridor along the existing El Paso gas line would perpetuate the visual intrusion of the service road from certain view points. The corridor in the northeast is not

## *Impacts to Visual Resources from Alternative 2*

viewed as often as the El Paso gas line corridor, and new development, if allowed, should not dominate the viewshed. If conforming to Class II prescriptions, the corridor should retain high scenic values.

#### *Off-Highway Vehicle Management*

Limiting motor vehicles to designated roads under Alternative 2 might reduce the perpetuation of wildcat roads and the potential for creating new wildcat roads and would thus benefit visual resources. Under road closures, the reduction in miles of roads could reduce some visual intrusions. But few, if any, of these roads affect the prime viewshed.

#### *Recreation Management*

Group sites, parking areas, and campsites prescribed in Zones 1 and 2 under Alternative 2 could become visual intrusions if they are placed in dominant viewsheds. The southern end of the Airstrip might become a dominant feature from a prime viewpoint (Road 900 and ranch headquarters), if not landscaped to reduce visual intrusions. Restricting camping within the main road corridors would enhance VRM values from prime viewing areas. Establishing a group site at the Airstrip might not conform to Class II standards, unless it is landscaped to a more natural appearance.

#### *Arizona Trail*

Trail placement in dominant viewsheds under Alternative 2 could slightly reduce scenic qualities. Livestock Grazing Under Alternative 2, some current livestock infrastructure might not conform to stricter Class II standards. Range improvements might also not adhere to designs that conform to stricter Class II standards.

### **From Special Designations**

#### *Areas of Critical Environmental Concern*

Designation of more ACECs under Alternative 2 might ensure compliance of Class II VRM designation.

***Impacts to Visual Resources from Alternative 3***

**From Desired Resource Conditions**

*Watershed, Fish and Wildlife, Visual and Cultural Resource Management*

Impacts under Alternative 3 would be the same as under Alternative 2.

**From Land Use Allocations**

*Mineral Development*

Mineral development outside ACECs under Alternative 3 would have similar types of impacts as under Alternative 1 but at a much greater scale. Potential mineral material sales outside the ACEC could slightly impair the viewshed, but would have to conform to Class II standards.

*Utility Rights-of-Way and Land Use Authorizations*

An added utility corridor (three versus two) under Alternative 3 would increase the potential for degrading visual resource management classes in other areas. Impacts could be mitigated. Buried utility lines could reduce visual impacts as long as the affected land is rehabilitated to conform to Class II designations. But buried lines are not feasible for all applications.

*Off-Highway Vehicle Management*

Impacts under Alternative 3 would be the same as under Alternative 2.

*Recreation Management*

Recreation Zone 2 under Alternative 3 could retain high VRM values because of limiting camping to a few designated campsites. Because Zone 2 would include the largest area under Alternative 3, this restriction might be more beneficial to visual resource values than restrictions under Alternative 2, which cover less area. Some Zone 2 developments, including

some barricades and permanently altered areas for parking lots and campsites, might not conform to VRM Class II standards and would have to be mitigated. Zone 3 would have a tendency to receive more impacts to landscape because of the dispersed camping prescription. Zone 3 covers less area under Alternative 3 than under the other alternatives.

Permanent recreation use of the Airstrip would slightly mar the viewshed because the airstrip is in a prominent location and does not fit into Class II standards. Restoring and revegetating the southern end of the Airstrip instead of the northern end to camouflage proposed recreation development plans might be more suitable for retaining Class II standards.

*Arizona Trail*

Impacts under Alternative 3 would be similar to those under Alternative 2. Trail placement in the dominant viewshed could slightly reduce scenic qualities.

*Livestock Grazing*

Impacts under Alternative 3 would be the same as under Alternative 2.

**From Special Designation**

*Areas of Critical Environmental Concern*

Impacts under Alternative 3 would be the same as under Alternative 2.

***Impacts to Visual Resources from Alternative 4***

**From Desired Resource Conditions**

*Watershed, Fish and Wildlife, Visual and Cultural Resource Management*

Impacts under Alternative 4 would be the same as under Alternative 2.

*Impacts to Cultural and Paleontological Resources from Alternative 1 (Current Management)*

**From Land Use Allocations**

Mineral Development

Impacts under Alternative 4 would be the same as under Alternative 2.

Utility Rights-of-Way and Land Use Authorizations

Impacts would be similar to those under Alternatives 2 and 3 but would have slightly less potential for visual intrusion under Alternative 4, which would designate only one corridor instead of two or three. The proposed corridor in the northeast corner of the planning area is generally not within prime viewshed. This corridor would be the preferable alternative for retaining the quality of the viewshed from prime viewing locations on Road 900 and at ranch headquarters.

Off-Highway Vehicle Management

Impacts under Alternative 4 would be the same as under Alternative 2.

Recreation Management

The recreation zone configuration under Alternative 4 would have the most area in Zone 3. This area would receive more dispersed camping and would harm the viewshed slightly more from main viewing roads than would Alternatives 2 or 3. The partial use of the Airstrip could be reversed to the other end of the Airstrip to conform to VRM Class II.

Arizona Trail

The Alternative 4 proposal for the Arizona Trail would cause the least amount of added impacts to the existing viewshed, because the trail would be routed along existing roads. Using existing routes for the Arizona Trail would reduce potential adverse impacts to VRM critical vantage points

Livestock Grazing

Although livestock would no longer graze on public land, continuing cattle operations on

intermixed and adjacent State Trust Lands could degrade VRM Class II values by creating the need for miles of new fence lines. Some cattle operation needs might also intrude on prime viewsheds on State Trust Lands. If BLM retains range developments for wildlife or recreation use after removing livestock, those developments would continue to intrude on visual resources.

**From Special Designations**

Areas of Critical Environmental Concern

Impacts under Alternative 4 would be the same as under Alternative 2.

**CULTURAL AND PALEONTOLOGICAL RESOURCES**

**Impacts to Cultural and Paleontological Resources**

**Scope of Analysis:** This section uses the potential for disturbance to or for increased protection of cultural and paleontological resources to compare the impacts of the alternatives on cultural and paleontological resources.

***Impacts to Cultural and Paleontological Resources from Alternative 1 (Current Management)***

**From Desired Resource Conditions**

Watershed: Upland, Riparian, and Aquatic Vegetation Management

Vegetation cover often helps to preserve archaeological sites by reducing and inhibiting soil erosion. Lack of integrated vegetation treatment in the planning area would eliminate a protective action from which most cultural resources could benefit.



## *Chapter 4: Cultural and Paleontological Resources*

### *Fish and Wildlife Management*

Actions proposed for wildlife management under Alternative 1 would benefit cultural resources to a limited extent by limiting human and livestock disturbances.

### *Visual Resource Management (VRM)*

Designating VRM Class III under Alternative 1 could allow some visual intrusion of the landscape surrounding the historic Empire Ranch headquarters. Such intrusions might include utility lines, roads, buildings, and other structures.

### *Cultural Resource Management*

BLM would comply with National Historic Preservation Act mandates for preserving and treating the planning area's cultural resources. But limited funds and staff time might hamper or slow the work.

Accumulation of archaeological data would continue to be limited and would largely depend upon Class III inventories conducted on a project-by-project basis for small-scale projects and undertakings, such as building wildlife or livestock watering tanks or fences or occasional rerouting of a short stretch of road. A database to enable the meeting of the cultural resource objective would develop only very slowly over a long period. BLM would probably not conduct Class I and II cultural resource inventories unless it somehow acquires special funds or an occasional scientific project funded by a university research grant or other non-BLM entity. BLM would probably not accumulate the data needed to develop a well-rounded and complete cultural resource management program for the planning area. Additionally, BLM would probably not collect or present interpretive and educational materials useful to the public.

Under all alternatives, BLM would evaluate, stabilize, and manage historic properties under the Secretary of the Interior's Standards for

National Register Eligible Sites. Under Alternative 1, BLM would continue to stabilize and preserve the Empire Ranch headquarters buildings, but the work would largely depend upon grants obtained through the Empire Ranch Foundation. The buildings would probably deteriorate faster than stabilization could be funded through the foundation or sporadically by BLM.

Limited funds and staff time would probably hamper or slow work on completing National Register forms for historic buildings (other than the Empire Ranch House, which is listed on the National Register). Alternative 1 would limit the scope of interpretive programs at the Empire Ranch headquarters and would not include the educational opportunities provided under Alternatives 2, 3, and 4.

## **From Land Use Allocations**

### *Mineral Development*

Under Alternative 1 keeping 48,542 acres of acquired public lands closed to locatable and leaseable mineral development and closing all public lands to salable mineral (discretionary) development would protect cultural and paleontological resources in those areas from mining disturbance. But mining could disturb some cultural and paleontological resources on ~~5,915~~ **7,167** acres of split-estate lands and 458 acres of original public domain in the Empire Mountains. Mining plans of operations could be designed to avoid cultural or paleontological sites or mitigate impacts through data recovery.

### *Utility Rights-of-Way and Land Use Authorizations*

With an absence of designated utility corridors, construction and maintenance of randomly placed utility lines could disturb some cultural and paleontological sites. But utility lines could be designed to avoid sites, or data recovery could mitigate impacts.

## *Impacts to Cultural and Paleontological Resources from Alternative 2*

### Off-Highway Vehicle Management

The most serious threat to the planning area's cultural resources is posed by people illegally driving four-wheel-drive vehicles, all-terrain vehicles, and motorcycles off of roads. Vehicles can damage cultural sites by driving over them. Some people might also use these types of vehicles to drive into remote areas, where they illegally collect surface artifacts and vandalize and loot cultural sites. Protecting the planning area's cultural resources, while allowing recreational vehicle use in the area, would be a difficult task.

Under Alternative 1, limiting vehicles to the existing ~~116.4~~ **113.2** mile road network would continue impacts at several locations where roads cross cultural sites. Alternative 1 would also allow access to remote areas where sites are vulnerable to looting, vandalism, and illegal surface collecting. By not allowing the creation of random new roads, Alternative 1 would help protect some sites. Roads affecting sites could be rerouted to avoid causing further damage. Dirt or gravel pads could be laid on sections of roads crossing sites, to protect against further damage. If no other course is possible, BLM could close a road that is causing or allowing a site to be damaged. BLM would also close to public use roads providing access to sites being looted, vandalized, or subjected to illegal surface collection.

Designating ~~20.3~~ **21.1** miles of road for administrative use only would restrict public access into some areas where cultural sites are vulnerable to impacts. BLM would conduct Class III cultural resource surveys where roads are closed and reclaimed, as well as along roadways where such inventories have not been conducted. Where necessary and feasible, roads would be rerouted to avoid further site impacts, or data collection would be used to mitigate impacts.

### Recreation Management

By not establishing recreation zones, Alternative 1 would encourage dispersed recreational uses that would disturb some cultural sites. Without zones, the irregular and unplanned uses by the public at the Empire Ranch headquarters would continue.

### Arizona Trail

By not designating a corridor for the Arizona Trail, Alternative 1 would avoid direct cultural site impacts from trail building and associated cumulative impacts.

### Livestock Grazing

Currently, livestock are fenced from areas where cultural site densities are high and are dispersed where site densities are low. BLM could erect protective fences around sites that livestock might disturb. No grazing in the Empire Mountains would encourage vegetation growth, which might reduce soil erosion at some sites. Class III cultural resource surveys would continue for all grazing improvements, such as livestock tanks and fences.

## **From Special Designations**

### Areas of Critical Environmental Concern

By not designating Cienega Creek and portions of Gardner Canyon, Empire Gulch, and Mattie Canyon as ACECs, Alternative 1 could preclude management prescriptions that might help preserve cultural resources in those areas.

## ***Impacts to Cultural and Paleontological Resources from Alternative 2***

## **From Desired Resource Conditions**

### Watershed: Upland, Riparian, and Aquatic Vegetation Management

Actions proposed for integrated vegetation treatment under Alternatives 2, 3, and 4 would benefit cultural and paleontological resources by increasing vegetation cover and reducing soil

## *Chapter 4: Cultural and Paleontological Resources*

erosion at many sites. BLM would conduct Class III surveys to find cultural and paleontological sites in all treatment areas and would design prescriptions to avoid or mitigate impacts.

Implementing the Fire Management Plan would reduce fuels around the buildings at the Empire Ranch headquarters and encourage growth of vegetation that would conserve soil at many cultural sites throughout the planning area. For prescribed burns, BLM would follow guidelines specified under “Requirements for Cultural Resource Inventory of Prescribed Burn Areas,” Appendix 5, BLM Handbook H-8120.

### *Fish and Wildlife Management*

Management for priority species and priority habitats would help preserve cultural resources. Actions proposed for fish and wildlife management under Alternatives 2, 3, and 4 would encourage preserving some cultural resources. BLM would conduct Class III surveys to find cultural sites in all treatment areas and design prescriptions to avoid or mitigate impacts.

### *Visual Resource Management (VRM)*

Designating a Class II visual management area would help preserve cultural and paleontological resources by prohibiting physical disturbances at some cultural sites. This proposal would help preserve the visual integrity of the historic landscape around the Empire Ranch headquarters because Class II restricts changes to the existing character of the landscape more than VRM Class III under current management.

### *Cultural Resource Management*

Under Alternative 2, the public and the scientific community would benefit from a wide array of educational, interpretive, and research uses at the Empire Ranch headquarters and sites outside the headquarters area. Adaptive reuse of the historic buildings would facilitate their

preservation and allow both public and administrative uses. Use of partnership and volunteer labor would allow the public to participate in interesting and unique projects not generally offered elsewhere, while accomplishing tasks to comply with the National Historic Preservation Act and BLM objectives.

Scientific information accumulated from cultural resource inventories and data collection at sites outside the ranch headquarters would contribute knowledge toward understanding human use of the planning area during prehistoric and historic times. Such information would also be crucial to managing the planning area’s cultural resources.

Under Alternatives 2, 3, and 4, local communities and residents would have a restored historic site at the Empire Ranch headquarters to represent their history and development and ranching’s contribution to the area. Developing the ranch headquarters would give school groups an unusual, natural and cultural laboratory for studies. The headquarters would also allow students and teachers to intern, join hands-on programs, or conduct studies at the headquarters and planning area.

Under Alternatives 2, 3, and 4, visitors to the headquarters would have fully developed facilities with drinking water, restrooms, Americans with Disabilities Act access, shade, and communications. Alternatives 2, 3, and 4 would best meet the desired resource conditions for the headquarters by offering the public more programs while maintaining the historic properties.

## **From Land Use Allocations**

### *Mineral Development*

By essentially eliminating locatable and leasable mineral development in the planning area, Alternative 2 would protect the area’s cultural

## *Impacts to Cultural and Paleontological Resources from Alternative 2*

and paleontological resources from disturbances of mining.

~~The activity plans for Alternatives 2, 3, and 4~~ **minerals management actions** would eliminate the earth disturbance of gold panning from areas where cultural sites might be harmed.

### Utility Rights-of-Way and Land Use Authorizations

Designating two utility corridors across public land in the planning area could damage cultural and paleontological resources in those corridors. But utility lines could be designed to avoid disturbing cultural and paleontological sites, or impacts could be mitigated with data recovery.

Designating utility corridors would confine site impacts to specified linear areas and facilitate impact management, as opposed to widely dispersed impacts that might result with randomly placed corridors. Class III cultural resource inventories would be conducted within each right-of-way corridor and, where suitable, ensuring that treatment and mitigation prescriptions would be developed and implemented. Under Alternative 2, disturbance to cultural and paleontological sites would be more confined within the corridors than at multiple locations in the planning area.

### Off-Highway Vehicle Management

Alternative 2 would limit motor vehicle use on 49,000 acres of public land to designated roads covering 93.9 ~~91.9~~ miles. But some cultural sites would remain vulnerable to impacts from motor vehicles. BLM would conduct Class III cultural resource surveys on existing and future road and trail routes and on roads to be closed and reclaimed. Information collected during these surveys would be used to develop plans for the following:

- Site avoidance or physical protection (dirt or gravel pad).

- Data recovery where roads and trails cannot avoid sites.
- Monitoring for all sites in or near trails and roads.

When needed, BLM could close roads and trails to protect sites. BLM would not create new roads or trails that might disturb or destroy cultural sites. Some areas with significant cultural properties and possible paleontological sites would remain accessible and would continue to have the potential for illegal surface collecting, vandalism, and looting.

### Recreation Management

Designating recreation Zones 1, 2, and 3 could affect cultural and paleontological resources. In Zone 1, the Empire Ranch buildings would be preserved and interpreted for the public. Land surrounding the buildings would be surveyed at a Class III level and site impacts would be mitigated by data collection. BLM would manage the buildings and adjacent land according to requirements of the National Historic Preservation Act and the National Register of Historic Places. Designating and managing the headquarters as Zone 1 would benefit cultural and paleontological resources dispersed elsewhere because visitors and facilities would be concentrated at the headquarters. Certain types of visitors would confine all activities to the headquarters rather than the remaining planning area.

In Zone 2, corridors along Oak Tree Canyon and South Road would be surveyed at a Class III level. Data collection or recovery would mitigate impacts. BLM would routinely monitor and assess for mitigation needs the cultural properties and sites along these corridors.

In Zone 3, BLM would survey roads and trails at a Class III level and reroute or close them where they affect cultural sites. Data collection or

## *Chapter 4: Cultural and Paleontological Resources*

recovery could mitigate impacts. When needed, fees could be used to mitigate impacts caused by recreation use.

Under Alternatives 2, 3, and 4, a recreation permit system could be used to ensure that visitor levels remain compatible with protecting cultural resources, including the historic ranch headquarters. A fee program, if established as part of the permit system, would supplement objectives for educational and scientific use and preservation of the planning area's cultural and paleontological resources. Fees could also help pay for rehabilitation, maintenance, and adaptive reuse of the Empire Ranch headquarters buildings and also for stabilizing archaeological and paleontological sites throughout the planning area.

### Arizona Trail

Under Alternative 2, designating a corridor for the Arizona Trail would disturb some cultural sites and could disturb some paleontological sites. The trail route would be surveyed at a Class III level and, where possible, routed to avoid sites. Data collection or recovery would mitigate any direct impacts from trail building and cumulative visitor use. BLM would routinely monitor sites along the trail to assess and mitigate impacts of trail use.

### Livestock Grazing

Impacts from management of grazing on the Empire-Cienega, Empirita, Rose Tree, and Vera Earl allotments under Alternative 2 would be the same as under Alternative 1. BLM would design grazing management in new allotments in the Empire Mountains to disperse livestock and prevent their congregating where cultural properties might be located. BLM would conduct Class III cultural resource surveys before placing any range improvement structures, such as fences and livestock watering tanks. Such structures would be designed to avoid both direct and cumulative impacts. Enclosure fences could be built around cultural

properties to protect them from livestock damage.

### **From Special Designations**

#### Areas of Critical Environmental Concern

ACEC management in the planning area under Alternative 2 would emphasize protecting and enhancing soil, vegetation, and wildlife. Cultural and paleontological resources in an ACEC would benefit from these prescriptions through increased vegetation cover and reduced soil erosion.

### ***Impacts to Cultural and Paleontological Resources from Alternative 3***

#### **From Desired Resource Conditions**

#### Watershed, Fish and Wildlife, Visual and Cultural Resource Management

Impacts under Alternative 3 would be the same as under Alternative 2.

#### **From Land Use Allocations**

#### Mineral Development

Under Alternative 3, mining could disturb cultural and paleontological resources on 41,000 acres of public land open to mineral location and on 45,859 acres of public land open to mineral leasing. But mining would not disturb cultural and paleontological resources in ACECs. Mines could be designed to avoid some cultural and paleontological properties, and some disturbance could be mitigated with data recovery.

#### Utility Rights-of-Way and Land Use Authorizations

Impacts to cultural and paleontological resources from utility rights-of-way and land use authorizations under Alternative 3 would be the same as under Alternative 2. Potential impacts and avoidance or mitigation of impacts would apply as under Alternative 2, except that a third

## *Impacts to Cultural and Paleontological Resources from Alternative 4*

utility corridor could disturb more cultural and paleontological sites. A Class III survey would be required on the rights-of-way along Highway 82. Data recovery would be required at all National Register eligible sites that the survey finds and that would be disturbed by installing utility lines.

### Off-Highway Vehicle Management

Although the number of miles vary for road closures and restrictions, the impacts and avoidance and mitigation prescriptions under Alternative 3 would be the same as under Alternative 2.

### Recreation Management

Management of uses and impacts to cultural and paleontological resources would be the same under Alternative 3 as under Alternative 2.

### Arizona Trail

Impacts to cultural and paleontological resources from the Arizona Trail under Alternative 3 would be the same as under Alternative 2, except that under Alternative 3, the Arizona Trail would channel people into a narrow corridor having significant cultural resources, subjecting them to looting, vandalism, casual visitor impacts, and illegal surface collecting. Data accumulated by a Class III survey could aid in trail layout and design to avoid directly disturbing sites in this corridor. These sites would be vulnerable to increased levels of looting, vandalism, illegal surface collecting, and unauthorized visitation.

### Livestock Grazing

Under Alternative 3, livestock grazing would affect cultural resources in the same manner as under Alternatives 1 and 2.

## **From Special Designations**

### Areas of Critical Environmental Concern

Under Alternative 3, management prescriptions to enhance soil, vegetation, and wildlife in the

Cienega Creek and Nogales Springs ACECs would help protect archaeological sites against soil erosion. Cultural resources would benefit as they would under Alternative 2, because both ACEC proposals would protect riparian areas where cultural resources tend to be most prevalent.

## ***Impacts to Cultural and Paleontological Resources from Alternative 4***

### **From Desired Resource Conditions**

#### Watershed, Fish and Wildlife, Visual and Cultural Resource Management

Impacts under Alternative 4 would be the same as under Alternative 2.

### **From Land Use Allocations**

#### Mineral Development

Impacts under Alternative 4 would be the same as under Alternative 2. Utility Rights-of-Way and Land Use Authorizations Potential impacts and avoidance or mitigation of impacts under Alternative 4 would be the same as under Alternatives 2 and 3. But under Alternative 4, potential impacts would be confined to sites in only one utility corridor.

#### Off-Highway Vehicle Management

Although the numbers of miles would vary for road closures and restrictions, the impacts, avoidance, and mitigation prescriptions under Alternative 4 would be the same as under Alternatives 2 and 3.

#### Recreation Management

Management of uses and impacts to cultural and paleontological resources would be the same under Alternative 4 as under Alternatives 2 and 3.

#### Arizona Trail

Under Alternative 4, designating eight miles of existing road as the Arizona Trail corridor

## *Chapter 4: Land Use*

would disturb locations where roads now cross some cultural sites. BLM could reroute the trail to avoid sites, or mitigate impacts by data recovery.

### *Livestock Grazing*

Exclusion of livestock from public lands in the planning area could both benefit and harm the area's cultural and paleontological resources. Eliminating livestock could enhance the growth of vegetation cover and reduce soil erosion at some cultural sites. But cumulative impacts on cultural resources could occur if ranches are subdivided or visitation to the area increases.

### ***Cumulative Impacts--Cultural and Paleontological Resources***

Loss of grazing on public lands could result in the failure of adjacent and associated ranch businesses and in turn encourage the sale of adjacent State Trust and private land for residential development. Statistical data collected during the past decades from public land throughout the Southwest shows that illegal surface collecting, vandalism, and looting increase on public land sites as residential development occurs on adjacent and nearby private lands. This process would probably occur should State Trust and private land next to public land in the planning area be developed for residential use. Also, earth moving for residential development could disturb or obliterate significant prehistoric village sites and historic ranch and homestead sites. Such development might change natural drainage systems and cause flooding and loss of cultural sites through stream bank erosion.

Increasing tourism and recreation are trends being experienced in the watershed and beyond as Kartchner Caverns and other developments open. The spinoff effects of such visits to the planning area are unknown, but are expected to increase as visitors discover the area and as marketing promotes the Sonoita-Patagonia/Hwy. 82-83 loop. As visitation increases to the

headquarters, visitation to surrounding communities such as Sonoita would also be likely to increase. Communities and local businesses would benefit economically from increased visitation.

## **LAND USES**

### **Impacts to Lands and Realty Actions**

**Scope of Analysis:** This section uses impacts on the ability to permit land use authorizations and provide services to compare the impacts of the alternatives on lands and realty actions.

### ***Impacts to Lands and Realty Actions from All Alternatives***

#### **From Desired Resource Conditions**

##### *Watershed: Upland, Riparian, and Aquatic Vegetation Management*

Lack of an integrated vegetation treatment program under Alternative 1 would not affect lands and realty actions. Under Alternatives 2, 3, and 4 proposed vegetation treatments, including prescribed fire, could affect existing and future utility right-of-way facilities. Mitigation measures would need to be adopted to avoid damaging facilities. In addition, applicants for utility right-of-way facilities must be aware of these mitigation measures for the proposed vegetation treatments and how these measures might affect their facilities.

Wildland fire management under all alternatives would help protect facilities from wildfires.

##### *Fish and Wildlife Management*

Under all alternatives, protecting threatened, endangered, and sensitive plants and animals could impede the installing of new right-of-way facilities or could increase development costs due to mitigation. BLM might have to require mitigation to avoid harm to priority species or

prevent jeopardizing the existence of endangered or proposed species. If a proposed right-of-way facility cannot be installed within the proposed right-of-way corridors without harming a priority species, an alternative right-of-way corridor might have to be selected for the proposed use. If the impacts could not be mitigated, BLM might have to deny the application.

Under all alternatives, proposals to remove or modify rights-of-way would be difficult and expensive for the holders and have significant adverse economic and social impacts. According to regulation 43 CFR 2800, the right-of-way holder can continue to renew its right-of-way under the original terms of the right-of-way grant. BLM cannot terminate a right-of-way grant unless: (1) the holder has violated the terms of the grant and refuses to correct the violation, or (2) the right-of-way is no longer needed. As possible mitigation, BLM could suggest to the holders that they modify and move their facilities. Then only with the holder's permission could BLM modify the right-of-way grant to reflect changes from the original right-of-way plan of development, terms, and stipulations.

Removing existing roads could harm right-of-way users who use the subject roads to gain access to their facilities. Mitigation would need to ensure that holders have another road for reaching and servicing their facilities.

Cumulative Impacts: The listing of more threatened and endangered species would further restrict site availabilities and options for land use and right-of-way authorizations.

#### Visual Resource Management (VRM)

Under all alternatives, BLM would consider visual resources in developing and analyzing rights-of-ways or other land use proposals. Designating public lands as VRM Class III under Alternative 1 would less restrict land use

proposals than the more restrictive VRM Class II under Alternatives 2, 3, and 4. BLM would require mitigation to preserve existing visual resources; such preservation would increase development costs.

#### Cultural Resource Management

Under all alternatives, the discovery of any cultural sites could delay or preclude the installing of a right-of-way facility. Mitigation needed to avoid damaging the site would increase development costs. Should mitigation prohibit the installing of a new facility, an alternative right-of-way corridor would be used. Otherwise, BLM would have to deny the application.

#### **From Land Use Allocations**

##### Mineral Development

Any mineral development under Alternatives 1 or 3 would likely result in requests for utility rights-of-way or other land use permits to service the mining facilities. Opening up the most area to mining, Alternative 3 would be most likely to cause these impacts.

##### Utility Rights-of-Way and Land Use Authorizations

BLM ~~must be able to meet the needs and provide the services required by utility companies now and in the future.~~ **will attempt to meet the needs requested by utility companies provided that the services and needs are conducive and in accordance to federal laws, regulations and the goals and values of the Las Cienegas NCA, as set forth by congressional legislation.** The designated utility corridors within the planning area under Alternatives 2, 3, and 4 respond in varying degrees to the expected increase in future right-of-way requests, which would be driven by economic and social factors. With the deregulation of the utility industry increasing demands for more interstate and intrastate utility routes are likely. The increase of regional developments on adjacent private



## *Chapter 4: Land Use*

lands, State Trust Lands, and neighboring cities outside the planning area would bring a need for the utility industry to accommodate consumer needs. The proliferation of utility routes crossing the public lands in the planning area might be attributed to the capacity restrictions on existing major utility corridors along Interstate 10 and through State Trust and Forest Service lands.

Once existing utility corridors reach their capacities, later utility routes would look more to using the designated corridors proposed in this plan. Alternative 4 would provide the fewest routing options with only one corridor. Alternative 2 would provide a moderate level of routing options with two corridors. Alternative 3 would provide the highest level of routing options with three corridors. Because the BLM-managed land crossed in these utility corridors is such a small percent of the total, the ability to obtain rights-of-ways across adjoining State Trust Lands might have more impact than obtaining rights-of-ways across public land.

### Off-Highway Vehicle Management

Motor vehicle travel on utility easements or access routes under all alternatives might result in conflicts between users and utilities over damage to facilities and liability concerns.

### Road Designations

Road closures and restrictions under Alternatives 1 and 3 would not affect lands and realty actions.

Under Alternatives 2 and 4 road closures might conflict with access routes used by utility rights-of-way holders and with proposed utility facilities. Proposed closures could be mitigated by not allowing the closing of any roads or trails used to access utility rights-of-way. BLM would need to grant administrative access for all authorized users. Fewer roads closed would impose fewer access restrictions on right-of-way holders.

### Recreation Management

The designation of recreation zones would not affect lands and realty actions under any of the alternatives.

### Arizona Trail

Under Alternatives 2, 3, and 4, the use of the Arizona Trail could conflict with access routes being used by utility right-of-way holders. Any new trails or roads built for the Arizona Trail could be mitigated by not allowing the trail to interfere with a right-of-way holder's facilities, maintenance, and access. Designating the Arizona Trail would require access authorization from El Paso Gas Company to cross its gas line property, which runs through public lands in the planning area.

### Livestock Grazing

Livestock grazing management would not affect lands and realty actions under any of the alternatives.

## **From Special Designations**

### Areas of Critical Environmental Concern

ACEC designation would not affect lands and realty actions under Alternatives 1, 2, and 4. Designating an ACEC could conflict with the proposed right-of-way utility corridor and existing rights-of-way on public lands in two sections:

T.18 S., R. 17 E., Sec. 12

T.18 S., R. 18 E., Sec. 7

**Cumulative Impacts:** The ACEC designation for sensitive species and resources would more greatly restrict the availability of sites and allow fewer options for providing land use and right-of-way authorizations.

## Impacts to Mineral Development

**Scope of Analysis:** This section uses the acreage open to potential mineral exploration and development to compare the impacts of the alternatives on mineral development.

### *Impacts to Fluid Mineral Leasing*

#### *Impacts to Fluid Mineral Leasing from Alternative 1 (Current Management)*

The planning area contains lands that are prospectively valuable for oil and gas. This area represents about 5% of the land in southeast Arizona (Cochise, Eastern Pima, and Santa Cruz counties) that is prospectively valuable for oil and gas. About 48,542 **48,498** acres (**88%**) of BLM-managed land and mineral estate prospectively valuable for oil and gas are not open to mineral leasing under current management. The original public domain lands (458 acres) and split-estate lands (5,914.6 **7,167** acres) are open to fluid mineral leasing under current management. This acreage represents  $\pm$  **13.5%** of the public land mineral estate. BLM considers lease applications and permits to drill on a case-by-case basis. About 25,000 acres of the Cienega Basin that is prospectively valuable for oil and gas is open to fluid leasing on the State Trust Lands, which are managed by the Arizona State Land Department. Therefore, under current management, 40% of the Cienega Basin that is prospectively valuable for oil and gas is open to mineral leasing and 60% is closed.

#### *Cumulative Impacts--Alternative 1 on Fluid Mineral Leasing (Current Management)*

Cumulative impacts to the oil and gas industry are expected to be nominal given the limited interest in the basin during the past 60 years. Alternative 1 does not affect geothermal resources because the planning area is not prospectively valuable for geothermal energy.

#### *Impacts to Fluid Mineral Leasing from Alternative 2*

Alternative 2 would close split-estate and public domain lands to mineral leasing, increasing the planning area acreage closed to leasing by ~~6,373~~ **7,625** acres, a  $\pm$  **16%** increase from Alternative 1. A total of ~~54,915~~ **56,123** acres would be closed. As a result, 70% of the planning area that is prospectively valuable for oil and gas would be closed to fluid mineral leasing.

#### *Cumulative Impacts--Alternative 2 on Fluid Mineral Leasing*

Cumulative impacts under Alternative 2 would be the same as under Alternative 1.

#### *Impacts to Fluid Mineral Leasing from Alternative 3*

Under Alternative 3, a total of ~~51,774~~ **52,983** acres of public land and public mineral estate in the planning area would be open to fluid mineral leasing subject to standard lease terms and conditions. Only lands within the Appleton-Whittell Research Ranch (3,140 acres) would remain closed to mineral leasing. The area open to mineral leasing would increase by ~~45,401~~ **45,358** acres (**84 70%**) over current acreage (Alternative 1). About ~~77,000~~ **78,000** acres or 96% of the planning area that is prospectively valuable for oil and gas would be open to fluid mineral leasing.

Areas of critical environmental concern (ACECs) would be subject to no surface occupancy. Permittees would have to directionally drill to targets that might be located beneath the ACEC, increasing drilling costs.

#### *Cumulative Impacts--Alternative 3 on Fluid Mineral Leasing*

Alternative 3 would open the entire Cienega Basin to fluid mineral leasing, increasing the area in southeast Arizona that is prospectively valuable for oil and gas by about 5%. An

increase in exploration, however, is not expected in the foreseeable future.

### ***Impacts to Fluid Mineral Leasing from Alternative 4***

Alternative 4 would affect fluid mineral development the same as would Alternative 2.

### ***Summary Overview***

Alternative 1 would help meet the goals and objectives for the planning area by limiting oil and gas exploration to a few scattered tracts of land throughout the planning area. Alternatives 2 and 4 would meet the goals and objectives more immediately by not allowing any oil and gas exploration within the planning area. Alternative 3 would not meet the goals and objectives in the short-term because oil and gas activity would disturb upland vegetation, upland wildlife, scenic beauty, and watershed health. Only in the long-term, after reclamation has erased the impacts, could the goals and objectives be maintained.

### ***Impacts to Locatable Minerals***

#### ***Impacts to Locatable Mineral Development from Alternative 1 (Current Management)***

Under current management all acquired public lands (48,542 ~~48,498~~ acres) are closed to mineral location. This acreage represents 88 ~~86.5~~ % of the federal mineral estate in the planning area. This closure prohibits mineral exploration in more than 33% of the planning area. About ~~5,900~~ 7,167 acres of split-estate lands and 458 acres of public lands in the Empire Mountains (~~12~~ 13.5% of the federal mineral estate in the planning area) are open to mineral location. State Trust Lands are also open to mineral exploration and development as authorized by the State of Arizona. Therefore, 65% of the planning area is open to mining either on federal mining claims or state leases.

#### ***Impacts to Locatable Mineral Development from Alternative 2***

Alternative 2 would close all public lands and split-estate lands to mineral location, removing ~~6,373~~ 7,625 more acres of land from locatable mineral exploration, a ~~12~~ 13.5% increase in closed area from current management (Alternative 1). Limiting mineral exploration to State Trust Lands would prevent exploration for high-purity limestone on the southeast side of the Empire Mountains and also prevent exploration for copper in 40% of the planning area. The one known deposit of limestone on federal lands within the planning area is under mining claims owned by the Georgia Marble Company. Therefore, the right to mine the deposit would be protected unless Georgia Marble drops the claims.

#### ***Cumulative Impacts--Alternative 2 on Locatable Mineral Development***

Several high-purity limestone deposits are known to occur in southeast Arizona. At least seven have been mined in the past, and four are still being mined. Therefore, closing the Empire Mountains would not prevent the mining of this important resource, and the cumulative impacts to the limestone industry would be slight. The cumulative impact to the copper mining industry under Alternative 2 would also be slight because the industry has not shown an interest in exploring for copper in the Cienega Basin and Empire Mountains for the last 30 years. Moreover, no interest is expected for the foreseeable future.

#### ***Impacts to Locatable Mineral Development from Alternative 3***

Alternative 3 would open all public lands to mineral location except lands within areas of critical environmental concern, including the Appleton-Whittell Research Ranch. Alternative 3 would open up 40,509 more acres (74% more land) to exploration for locatable minerals than would Alternative 1. Combined with the split-

estate lands, lands open to location would amount to 46,882 48,124 acres (85 86% of the federal mineral estate in the planning area). About 95% of the planning area would then be open to mining on either federal mining claims or state leases. This would be an increase in area open to mining of about 30% from current management (Alternative 1).

***Cumulative Impacts–Alternative 3 on Locatable Mineral Development***

More land would be open to mineral location in southeast Arizona. Exploration and mining are not expected to increase much in the foreseeable future.

***Impacts to Locatable Mineral Development from Alternative 4***

Alternative 4 would have the same effect on locatable mineral development as would Alternative 2.

***Summary Overview***

Alternative 1 would help meet the goals and objectives for the planning area by limiting mining to a few scattered tracts throughout the planning area. Alternatives 2 and 4 would meet the goals and objectives more immediately by not allowing any mining on public lands within the planning area. Alternative 3 would not meet the goals and objectives in the short term because mining would create direct adverse impacts to water quantity, upland vegetation, upland wildlife, scenic beauty, and watershed health, and indirect adverse impacts to water quality and aquatic life. Only in the long term, after the disturbances have been reclaimed, could the goals and objectives be maintained.

***Impacts to Salable Minerals***

***Impacts to Salable Mineral Development from Alternative 1 (Current Management)***

BLM does not grant sales of mineral materials

on public lands within the planning area. The urban growth centers of Tucson and Sierra Vista obtain their sand and gravel from sources closer to home. Therefore, closing the planning area to salable mineral development is not affecting the supply of sand and gravel for Tucson and Sierra Vista. Moreover, no one has shown an interest in mining sand and gravel in the planning area. Mineral material sales on private surface split-estate lands can be sold only to the surface owner.

***Impacts to Salable Mineral Development from Alternative 2***

The impacts to salable mineral development under Alternative 2 would be the same as under Alternative 1.

***Impacts to Salable Mineral Development from Alternative 3***

Under Alternative 3, BLM would not authorize mineral material sales within areas of critical environmental concern, including the Appleton-Whittell Research Ranch but would authorize them on other public lands in the planning area. This authorization would open up 40,509 more acres to mineral material sale applications for a total of 46,882 48,124 acres of public lands and public mineral estate. BLM would analyze mineral material applications on a case-by-case basis, and sales on the 4,474 5,727 acres of private surface split-estate lands would be limited to the surface owner.

***Cumulative Impacts--Alternative 3 on Salable Mineral Development***

Opening BLM lands to saleable minerals would provide many sources of sand and gravel to the mining industry. BLM expects little interest in sand and gravel sales in the planning area in the foreseeable future because of prohibitive haul distances to markets. For future road construction on Highways 83 or 82, the Arizona Department of Transportation might need to find material sources within the planning area.

### ***Impacts to Salable Mineral Development from Alternative 4***

The impacts to salable mineral development under Alternative 4 would be the same as under Alternative 1.

#### ***Summary Overview***

Alternatives 1, 2, and 4 would help meet the goals and objectives by closing the public land portion of the planning area to sales of mineral materials. Alternative 3 would not meet the goals and objectives in the short-term because mineral material sales would harm upland wildlife, upland vegetation, scenic beauty, and native plant diversity and abundance in the short-term. In the long-term, after mining has ceased and the site has been reclaimed, the objectives and goals could be met.

### **Impacts to Recreational Mining**

#### ***Impacts to Recreational Mining from Alternative 1***

Alternative 1 would not affect recreational mining.

#### ***Impacts to Recreational Mining from Alternatives 2, 3, and 4***

Prohibiting the public from recreational mining (e.g., gold panning, dredging, sluicing) in the areas of critical environmental concern would effectively close off Cienega Creek and many of its tributaries to recreational mining. But this prohibition would little affect recreational mining because currently and historically recreational mining has occurred on national forest lands around Greaterville, where there are known occurrences of placer gold.

### **Impacts to Ranching and Livestock Grazing**

**Scope of Analysis:** This section uses the acreage open to grazing, allowable use levels, and other constraints to compare the impacts of the alternatives on livestock grazing.

#### ***Impacts to Ranching and Livestock Grazing from Alternative 1 (Current Management)***

Alternative 1 would maintain ranching operations on public lands in the four allotments where families are employed in rural agriculture (i.e., Empire, Empirita, Vera Earl, and Rose Tree ranches) at least for the next 10-20 years. Currently, livestock do not graze BLM-administered lands in the Empire Mountains.

That BLM has no coordinated public outreach for the public lands in the planning area.

**Because of this, there is little education on the** and does little to reduce the harm of growing recreation use on livestock operations or to ~~explain~~ **explanation of** the benefits of preserving rural lifestyles, traditional uses, and open space.

On the Empire-Cienega allotment, variable stocking rates under a flexible grazing system result in variable net cash returns to the grazing permittee. Variable stocking rates also result in variable grazing receipts for BLM.

#### ***Cumulative Impacts–Alternative 1 on Ranching and Livestock Grazing (Current Management)***

The Sonoita Valley area is shifting from a rural to suburban economy. Recreation and ecotourism uses of the public lands are rapidly increasing. As urban centers continue to expand, the Sonoita-Elgin area is attracting people who want to escape the sprawl of cities. Recreation on public lands is continuing to increase in the planning area with very little regulation or constraint on its growth.

The increase in visitors and their diverse activities would continue until it is no longer feasible or suitable to graze cattle. Visitors are leaving gates open, vandalizing improvements, and starting wildfires. Roads must be maintained more often. The cumulative effect of these impacts is to increase the labor and capital outlay of the ranchers. The operations become less viable. Also, as the number of people recreating on the public lands continues to increase, the direct conflicts between people and livestock would increase. Recreation development under Alternative 1 would continue to increase until livestock grazing is not feasible. The shift from a rural agricultural-based economy to a residential- and service-related ecotourism economy would continue. The private lands would continue to be sold for residential and business development, decreasing the amount of open space for ranching. As private lands are sold off, the demand for more subdivision property next to the protected public lands would increase the demands for the State Land Department to sell State Trust Lands for development. Agricultural uses could not afford to compete with residential development in purchasing the lands. The trend would be toward less land for rural uses such as livestock grazing.

### ***Impacts to Ranching and Livestock Grazing from Alternative 2***

Alternative 2 would maintain ranching operations on public lands in four units where families are employed in rural agriculture for the next 10-20 years. In addition, it would create a new grazing allotment on public lands in the Empire Mountains and could generate personal income of more than \$1,700 and \$300 in grazing receipts on this allotment.

Implementing flexible grazing systems on all the allotments would result in variable stocking rates, cash returns, and grazing receipts.

To conduct their business livestock operators rely on water from streams and wells. **These water sources are located** on lands with various owners **The livestock operators also rely on obtaining various land use permits including access, utilities, and grazing leases.** Under Alternative 2, operators would continue to obtain these authorizations on public lands. There are currently few restrictions on drilling new wells. As they develop riparian pastures, ranchers must obtain authorizations to develop and use alternative water sources in the adjacent uplands. Resource conflicts would be resolved through the National Environmental Policy Act (NEPA) process and the biological planning process.

Alternative 2 would implement a coordinated outreach strategy. BLM would interpret the area for its values and uses and disseminate this information to the public through an outreach plan. This plan would educate the public and improve the public's understanding and knowledge of proper use. This outreach would include explaining the benefits of preserving rural lifestyles, traditional uses, and open space.

The proposed ACEC should raise public awareness of the importance of the planning area and its sensitive resources and help in obtaining increased levels of funding to acquire the inholdings. The inholdings would better protect resources that support grazing operations.

### ***Cumulative Impacts--Alternative 2 on Ranching and Livestock Grazing***

As described for Alternative 1, the shift from a rural agricultural-based economy to a residential- and service-related ecotourism economy would continue under Alternative 2. Acquiring private land inholdings could reduce the amount of open space lost in the planning area. Otherwise, owners could sell these lands for residential and business development, decreasing the amount of open space for

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ranching. BLM's acquisition or protection of State Trust Lands would greatly benefit the protection of all resources and uses in the planning area, including grazing operations for the long-term. Agricultural users could afford to obtain use authorizations on the acquired properties. The trend would be toward more land for rural uses such as grazing.

Recreation and ecotourism are rapidly increasing on the region's public lands. As urban centers continue to expand, the Sonoita-Elgin area would attract people who want to escape urban sprawl. Recreation uses on public lands would continue to increase up to the capacity of the zones.

### ***Impacts to Ranching and Livestock Grazing from Alternative 3***

Alternative 3 would also maintain ranching operations on public lands in four allotments where families would be engaged in rural agriculture for the next 10-20 years. In addition, Alternative 3 would create a new grazing allotment on public lands in the Empire Mountains. This allotment could generate personal income of more than \$1,700 and \$300 in grazing receipts. Grazing operators could still obtain the permits and authorizations to conduct their operations.

Establishing fixed conservative stocking rates for the allotments could reduce incomes due to fewer available AUMs. But incomes could be slightly more stable since stocking rates would not be as variable. Also, BLM would lose a small amount of revenue in grazing receipts. Alternative 3 would create a new grazing allotment in the Empire Mountains. This allotment could generate personal income of more than \$1,700 and \$300 in grazing receipts.

### ***Cumulative Impacts--Alternative 3 on Ranching and Livestock Grazing***

Cumulative Impacts under Alternative 3 would

be similar to those under Alternative 2.

### ***Impacts to Ranching and Livestock Grazing from Alternative 4***

Alternative 4 would eliminate ranching operations on public lands in the four allotments where families are employed in rural agriculture (i.e., Empire, Empirita, Vera Earl, and Rose Tree ranches). Currently, livestock do not graze on BLM-administered lands in the Empire Mountains. Alternative 4 would result in the loss of more than \$129,000 in personal income on the Empire-Cienega allotment and a loss of federal grazing receipts. This loss would reduce funding for rangeland improvements.

BLM would be required to fence the public lands to keep livestock grazing on adjacent lands out. **If all the public lands including the many scattered parcels were fenced to exclude livestock, about 110 miles of fencing would be needed at a cost of \$555,000. However, by utilizing existing fencing, livestock could be excluded from about 50% of the public lands including most of the riparian areas without the need to develop additional fencing. Other fencing configurations could be utilized to fence out the majority of public lands with about 40-50 miles of fencing.**

In addition to the required fencing, BLM would have to assume the maintenance responsibility for the new fencing as well as for the existing boundary fencing. BLM's experience in managing the San Pedro Riparian National Conservation Area also shows the need for hiring more staff to detect and resolve unauthorized grazing **use on the public lands excluded from grazing if surrounding lands are grazed. If the State Trust and private lands surrounding the public lands are not being grazed, then these grazing trespass costs would not be incurred. The fencing, fence maintenance, and trespass monitoring costs incurred by BLM under Alternative 4 would therefore be variable.**

*Impacts to Outdoor Recreation from Alternative 1 (Current Management)*

***Cumulative Impacts--Alternative 4 on Ranching and Livestock Grazing***

There are several scenarios which could occur relating to the State grazing leases held by BLM with differing impacts. BLM could sell the state grazing leases, it could obtain the resources to pursue a commercial permit, or it could apply for conservation use on State Trust lands.

Under Alternative 4, BLM would likely could sell the State of Arizona livestock grazing leases on the Empire-Cienega and Empirita ranches to the private sector. Well permits and water rights on the public lands obtained for livestock grazing would need to be relinquished or abandoned and new applications filed. The wells not being used for wildlife or recreational purposes would need to be abandoned and sealed. Water rights on the State Trust Lands would probably have to be sold with the grazing leases.

The Bureau managed lands tend to divide the valley east and west along Cienega Creek, and north to south from the Whetstone Mountains to the Santa Rita Mountains. Thus if the public lands (approximately 50,000 acres) are removed from existing ranches, the result would be creation of four quadrants of State Trust Lands (totaling about 100,000 acres) and private lands (totaling about 50,000 acres) with the public lands in the center. This would topographically create seven areas which could be put together as smaller ranches. As the ranches are fragmented into smaller units with less land available for grazing they become less attractive to ranchers and less viable economically.

Under this scenario, Alternative 4 would hasten the trend away from a rural society. The four families would no longer derive income from livestock produced using forage from the planning area's public rangelands. Cancelling the grazing authorizations would seriously affect the Empire-Cienega and Rose Tree ranches. The public relations of eliminating livestock

grazing on public lands would contribute to and probably hasten the elimination of livestock grazing on other properties.

As the agricultural nature of this area is lost, more pressure would come to bear on the State of Arizona to sell the State Trust Lands for development, which would likely soar in value due to the closeness to the federally protected resource lands. The sale of State Trust Lands would increase the residential construction and other commercial development, removing open space and native vegetation at a faster rate and providing progressively fewer options for continuing ranching as the resources on which this activity depends would become increasingly scarce.

If conservation use was applied for and obtained on State Trust lands surrounding the public lands, then opportunities for continuing livestock ranching would be very limited in the area

**Impacts to Outdoor Recreation**

**Scope of Analysis:** This section uses changes in recreation opportunity settings (see Table 2-7), corresponding changes in recreation experiences, and changes in access to compare the impacts of the alternatives on outdoor recreation.

***Impacts to Outdoor Recreation from Alternative 1 (Current Management)***

**From Desired Resource Conditions**

*Watershed: Upland, Riparian, and Aquatic Vegetation Management*

The lack of planned and integrated upland, riparian, and aquatic vegetation management under Alternative 1 might over the long-term detract from natural and semi-primitive recreation settings, particularly if plant



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invasions (both native and exotic) detract from some visitor's expectations of the area's scenery. Some short-term impacts to these settings and associated recreation experiences would be expected from vegetation treatments that BLM might authorize on a case-by-case basis.

### *Fish and Wildlife Management*

Current wildlife management enhances most recreation activities as shown on the register sheets collected over the past 10 years. Viewing wildlife was among the highest desired recreation activities reported. Hunting opportunities are high under current management, but the number of hunting opportunity comments received was lower than the number of wildlife viewing opportunity comments received.

### *Visual Resource Management (VRM)*

A Class III VRM designation under current management could affect visual resources and the overall viewshed in the long-term because Class III allows for some modification to the existing character of the landscape and could harm existing recreation opportunity settings, particularly with reductions in naturalness. Currently, a mostly natural appearing environment can be viewed from popular vantage points, such as portions of the main scenic highway and from most of the planning area roads and the ranch headquarters. Some current visual intrusions are power lines, dirt tanks, fences, roads, trails, a kiosk, and an airstrip. These intrusions slightly reduce visual quality but are generally consistent with Class III.

### *Cultural Resource Management*

Under current management, the historic ranch headquarters offers opportunities for sightseeing and discovering the past and often becomes a focal point for most visitors and commercial tour guides. Currently, BLM gives visitors only a limited interpretation of the site. Gradual

deterioration of historic structures and contents due to vandalism and weathering diminishes the quality of this recreational setting by creating health hazards and loss of the site's character. Alternative 1 lacks a comprehensive cultural interpretation program that could improve tourism needs while protecting the resource.

## **From Land Use Allocations**

### *Mineral Development*

Mineral development on public lands open to mining could change current recreation opportunities and visitor access, causing a loss of more primitive recreation experiences and scenic qualities. Motor traffic and road maintenance requirements could later increase and some road conditions would change.

Mineral development conflicts with the more primitive to semi-primitive motorized recreation in a mostly unmodified or natural appearing environment. Current recreation opportunities offer shared backcountry roads from two paved state highways (Highways 82 and 83) for motor vehicles, hikers, and horseback riders for day excursions, camping, and sightseeing. Potential new service roads for mineral development could provide motorized access points to previously inaccessible areas for sightseeing, casual recreation, exploration, and hunting

But many roads to mineral development sites restrict visitors. So motorized recreational use on new service roads could be limited, and some roads open to motorized recreation could be closed. Any roads that are shared with mineral development use might be more hazardous for motorists due to frequent encounters with larger mining vehicles.

Other recreation users, such as backpackers and hikers seeking more solitude, would benefit from restricted motorized access because it would reduce encounters with other visitors and their activities. But encounters with mining

### *Impacts to Outdoor Recreation from Alternative 1 (Current Management)*

vehicles and activities would increase on service roads and at mines. Mineral development could change current opportunities and settings from a primitive experience and semi-primitive motorized experience to rural. (See Recreation Spectrum Opportunity Settings, Table 2-7 in Chapter 2.)

#### Rights-of-Way

Utility rights-of-way and land use authorizations on public lands could change current recreation opportunities and visitor access, causing a loss of more primitive recreation experiences and scenic qualities. Motor traffic and road maintenance requirements could later increase and some road conditions would change.

Several existing utility rights-of-ways contain service roads used by visitors as access points. Even though Alternative 1 would designate no utility corridors, BLM might authorize new rights-of-way access in areas that provide primitive to semi-primitive motorized recreation opportunities. These access points for rights-of-ways could both benefit and reduce recreation opportunities. Improved access could increase visitors, providing more opportunities for motorized recreation but diminishing solitude and primitive experiences for others.

For example, unauthorized access points might increase for BLM lands. Some recreation users that gain legal access usually expect to see little or no traffic in the backcountry. But visitors accessing unauthorized points in the backcountry could degrade the legal-entry visitor's expectations of solitude and self-reliance in the more primitive areas.

Most service roads are popular unauthorized access points (under BLM policy) to the backcountry. Even with Tread Lightly or other OHV education campaigns to follow rules and respect posted signs, many visitors continue to use unauthorized roads. The challenge for the utility companies and BLM is as follows:

- To gain more public support for these rules.
- To close unauthorized access points while allowing for utility service.
- To hire people to monitor and enforce random unauthorized access into remote areas.

#### Off-Highway Vehicle Management

Current off-highway vehicle management has disturbed natural and more primitive recreation settings and opportunities.

Current management restricts motor vehicles to designated roads. But BLM has only partially implemented this designation, and motorized vehicles generally travel on the existing roads and trails. Over the past 10 years visitors have illegally created many roads, and repeated use has made them permanent. Since no universally accepted definition exists for an existing road or trail, enforcement to prevent illegal use of roads is difficult.

Visitors often created these roads, wanting a more primitive setting and seeking more solitude. But illegal off-road travel often crushes vegetation, harms wildlife species and habitats, and results in loss of ground cover from campsites, fire rings, and trash accumulation.

Currently, most roads are open to all users, and conflicts arise when expectations for use of roads are not met. Potentially conflicting recreation opportunities are promoted on shared use roads, such as when horseback riding is promoted on the same road that leads to an off-highway vehicle destination area. Whether or not conflicts arise, brochures and other marketing information often promote a wide variety of recreation uses that can either deter or encourage visitation by different users.

The current road numbering system generally benefits visitors by allowing quicker emergency

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help and reducing chances of getting lost. Road numbering also helps law enforcement (i.e., BLM, Sheriff, Game and Fish) regulate off-highway vehicle traffic. Several unnumbered or unsigned roads exist and complicate law enforcement and send mixed messages to users on what roads are legal. Some disadvantages of road numbering can include inadvertently directing visitors to sensitive wildlife habitat and cultural areas not signed in the past. Road numbering can give some visitors a false sense of security. Road numbering and maps can also lessen more primitive recreation experiences by directing new traffic to formerly low-use areas.

### Recreation Management

Under current management, the lack of designated recreation zones allows for continual random campsite creation and dispersed recreational use throughout the entire planning area. Gradually changing recreation settings (due to increased visitor use) in the short and long term and the lack of consistent identified recreation expectations and opportunities (often called niches or classifications) to promote or offer to the public makes management increasingly difficult.

Therefore, the recreation resources promoted as a whole would remain indefinite and would continue to contribute to the increase of conflicts among recreationists and other public land users. This conflict could gradually lead to greater damage to vegetation, wildlife, grazing opportunities, cultural resources, and recreation opportunities.

The lack of recreation zones under current management is favorable for some recreation users who perceive that their desired activities can continue indefinitely. But over the long term all recreationists' opportunities and experiences might change with increased, relatively unplanned recreation use.

### Arizona Trail

Under current management, not designating a corridor for the Arizona Trail means that the planning area would have one less highly desired nonmotorized trail. No Arizona Trail designation also means that a cumulatively large (500+ visitors a year) target audience is not attracted to the area. And visitors might create random social trails for the lack of a singlemarketed designated trail. (A social trail is an unplanned random trail made by initial visitors and then followed by others).

### Livestock Grazing Management

Generally, livestock grazing coexists with most recreation use in the area with relatively few impacts. But livestock grazing issues and impacts to recreation depend on individual expectations and knowledge of the area's grazing practices. Safety and health issues can be a concern. In extreme cases, cattle can harm people by charging. Other health concerns include contaminated water sources and insect pests from cattle waste. Camping in areas with cattle can detract from a high-quality recreation experience. But some visitors are not concerned about cattle at their campsites. The presence of cattle can enhance some visitor experiences because it is one of the niches promoted by tourism offices as an "Old West Theme" area and adds to the historic ranch atmosphere. Visitors often use trails created by cattle for hiking, bicycling, and horseback riding and also use water sources created for cattle.

Inconsistent promotion of recreation in the area without always explaining the grazing program can create differing expectations and reactions by visitors upon arrival. The lack of an effective interpretation program under current management adds to mixed qualities of recreational experiences when visitors encounter cattle operations.

## From Special Designations

### Areas of Critical Environmental Concern

Lack of any other ACEC designations under current management might slightly lower the quality of the recreation opportunity settings because sensitive resources might be at greater risk of being degraded.

### ***Cumulative Impacts—Alternative 1 on Outdoor Recreation***

Under Alternative 1, visitors to the planning area would continue to find rural to primitive recreation opportunities over the short term. However over the long term these recreation opportunities may not be maintained due to lack of recreation zones and associated management actions. This might impact the range of recreation opportunities available in southeastern Pima and northeastern Santa Cruz counties. Additional exclusively non-motorized trails would not be available. Visitors would continue to experience inconsistent management and differing regulations on intermixed public and State Trust lands. Without the Las Cienegas Implementation Strategy, it might take much longer for additional acquisitions of public lands. Without additional acquisitions, the conflicts associated with differing mandates for managing public and State Trust lands would continue.

### ***Impacts to Outdoor Recreation from Alternative 2***

## From Desired Resource Conditions

### Watershed: Upland, Riparian, and Aquatic Vegetation Management and Fish and Wildlife Management

The proposed actions for watershed, upland, riparian, and fish and wildlife management enhance the overall recreation settings and opportunities, but specific proposals may degrade some recreation opportunities and settings.

Some traditional campsites along Cienega Creek would be lost, but these campsites did not conform to the Leave No Trace ethics of camping too close to water. Restricting camping to areas 100 feet or more from water would increase wildlife viewing opportunities and improve vegetation and water quality conditions, desirable for most visitors. Limiting nonmotorized and motorized crossings of Cienega Creek for permitted group activities would concentrate impacts at designated crossings. Large groups would lose some sightseeing opportunities in the riparian zone. Vegetation treatments, such as prescribed fire, might degrade recreation settings in the short-term. In the short-term, visitors would benefit from the presence of fuel wood, and the removal of unwanted fuel wood tree stumps would improve visual resources. Recreation opportunities and settings, such as wildlife viewing and hiking in more natural appearing settings, would improve in riparian areas.

### Visual Resource Management (VRM)

VRM Class II is the same classification required in many wilderness areas, where fewer alterations to the landscape can be allowed. Designating this classification on the public lands within the planning area would moderately affect past and future recreation developments. The Class II designation would help maintain desired recreation opportunities and settings, including a more natural appearing and primitive recreation setting.

### Cultural Resource Management

Enhancing cultural resources through an interpretive and educational program and structure stabilization, especially at the Empire Ranch headquarters, would satisfy and direct most visitors to that area and would reduce impacts to backcountry areas that are intended to be more primitive to semi-primitive.

## From Land Use Allocations

### Mineral Development

Alternative 2 would eliminate potential impacts from mineral development under Alternative 1, if no valid existing claims are developed. Prohibiting recreational mining in riparian areas would eliminate one potential form of recreational activity. But the prohibition would help maintain the resources and conditions that provide existing primitive and semi-primitive opportunities and settings for other visitors. Most recreational mining occurs in the Santa Rita Mountains in Coronado National Forest and would not be affected by this proposal.

The administrative use of mineral material would reduce the cost of most recreation projects, including road maintenance designed to protect resources while allowing recreational use.

### Utility Rights-of-Way and Land Use Authorizations

Designating utility corridors should minimize the degrading of visual resources at recreation settings by utility developments and minimize conflicts of recreation use of utility access routes. Establishing a utility corridor next to the existing El Paso Gas line could perpetuate the need for the existing access road and further increase impacts from recreation use of this road. Continued recreation use of the service road would remain a constant challenge to maintain the more primitive recreation settings and opportunities.

### Off-Highway Vehicle Management

Fully implementing the *limited to designated* roads designation would create a wider variety of recreation opportunities and reduce user conflicts. Some roads proposed for closure would allow nonmotorized use, such as horseback riding and hiking, without sharing the routes with motor vehicles. Nonmotorized routes are in demand and this designation would

reduce the need to build new nonmotorized routes and lessen recreation conflicts. Overall, this designation would prevent negative impacts to desired recreation opportunities and natural resources.

Assigning numbers to roads that have been previously unsigned could give a false perception of safety and might direct unprepared visitors to rough backcountry roads. To avoid this pitfall, BLM would also need to sign road conditions. Intrusive road signs could slightly degrade Class II visual resource management classifications and have a slight effect on recreation settings.

### Recreation Management

**Some positive impacts from the Alternative 2 route designations are that several road segments will be offered as non-motorized trails. This action fulfills a highly desired setting and opportunity that would benefit many visitors.**

Establishing an individual recreation permit system would help preserve existing recreation settings and opportunities while recreation demands increase by addressing the area's recreation capacities. The option of a fee program could have several impacts:

- Recreation infrastructure proposals might not meet Land and Water Conservation Fund criteria for setting up fees for use of the entire area.
- Fee collections require more on-the-ground staff for compliance with Titles 36 and 43 of the Code of Federal Regulations.
- Overseeing a fee collection system could cost more than the actual fees recovered.

Establishing fees for a permit system could either dissuade or attract visitors. Those not wanting to pay the fees might choose to recreate

elsewhere. Others might view the fees as an indication of the presence of a desirable recreation infrastructure. The planned recreation infrastructure might not meet the expectations of some of these visitors. The collected fees can be reinvested at the site of collection to mitigate recreation-related resource impacts and build and maintain recreational developments. Collected fees could be used to pay for a recreational land use permit from the Arizona State Land Department for public recreation on State Trust Lands. Such a permit would help reduce current confusion and issues of intermixed lands with differing mandates and management.

**The specific recreation factors outlined in Table 2-26 establish a particular BLM recreation management niche. This niche can be described as an NCA that will emphasize three recreation zones that provide opportunities that range from rural to primitive and activities that will maintain the Cienega Valley basically as it appears now. Very little development is planned. Visitors seeking traditional developed campsites that contain permanently installed tables, shade structures, and other developments will be guided to visit other agency's or private recreation areas that are managing settings and opportunities to meet those expectations.**

**BLM and other promoters should be aware of this specific niche and provide consistent and accurate information that informs visitors of the more primitive nature so that expectations are met upon arrival. For instance, the speed limit will average 15- 25 mph throughout the entire NCA. This speed limit is a positive outcome for OHV users that enjoy slower travel speeds and encounters with others traveling at slower speeds. People hiking or horse back riding sharing routes with motorized vehicles will also benefit from this result. Visitor's with expectations to drive motorized vehicles at higher speeds will be guided to other suitable OHV areas outside of the NCA.**

The proposed recreation zone classifications under Alternative 2 could create a wider variety of recreation opportunities and settings. Zones 1 and 2 would protect natural resources more than they are protected now and would enhance recreation settings. Zone 3 might undergo an increase of use if campsite demands exceed designated sites in Zone 2. Law enforcement needs are expected to increase because there would be more restrictions to enforce.

All three recreation zones would allow some development to protect resource conditions. Such development could include providing a hardened surface. At Maternity Well, the option of installing a graveled parking lot would slightly alter the current recreation setting. Gravel might be an undesirable surface for most group overnight and day use, but it could keep dust from blowing. Gravel, pavement, or other surface hardening should be viewed as a last resort to mitigate recreation impacts. If erosion is occurring, BLM should first consider other light-handed methods in order to maintain more natural settings.

Under Alternative 2, recreation zone prescriptions, individual visitors would not be able to use the new Maternity Well site, which would be limited to groups under permit. Individual users who have been displaced from a traditional use area would most likely move to Zone 3 close to the main highways and roads or on other non-BLM areas. Displaced users of the northeast corner of old Agricultural Fields would not be harmed as much as individual Maternity Well users because the Agricultural Fields site has not been used as much as the Maternity Well site. Other designated group areas open to individual or casual use when not reserved by a group would slightly increase in use.

It is legally difficult to remove an individual camper if a group event is scheduled at the same time the individual is present. BLM must post a

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notice on the site at least two weeks in advance to advise individual campers of upcoming reserved site status. Closing off a reserved area would require more management intervention with a reservation system, opening and closing of the site, and on-site people to monitor the campsites. Zone 2 areas would more restrict campsite selection than Zone 3 areas, because Zone 2 prescriptions require use of designated camping areas. But this requirement can assure a consistent dispersed camping experience during times of high visitor use. In designated camp areas, newly arrived campers are less likely to infringe on the camping space picked out by an already present visitor. Such infringement is more likely in Zone 3. If the number of designated campsites remains low, a primitive to semi-primitive motorized experience can be maintained. Sites would fill quickly during high use and would require more monitoring for compliance.

### Arizona Trail

Designating a corridor for the Arizona Trail would give the planning area a highly desired nonmotorized trail and help reduce user conflicts on shared motorized-nonmotorized routes. The Arizona Trail might attract a cumulatively large (500+ a year) group of visitors to the area. This single marketed designated trail might reduce the creation of random social trails. An indirect impact might be the non-recreation use of the trail, such as by undocumented immigrants or persons involved in illegal border activities. This use in turn might increase trash, erosion, and human waste at large camps and degrade recreational settings and experiences.

### Livestock Grazing

Impacts to outdoor recreation from Alternative 2 grazing proposals would be similar to those under Alternative 1. Creating a new grazing allotment would expand potential conflicts between grazing and visitors to the Empire Mountains. Alternative 2 would bring

recreational users into the biological planning process, which should help reduce conflicts.

## From Special Designations

### Areas of Critical Environmental Concern

The ACEC designation would benefit primitive and semi-primitive recreation opportunities and settings by maintaining and protecting the sensitive resources in these areas.

### ***Cumulative Impacts—Alternative 2 on Outdoor Recreation***

Under Alternative 2, the public lands in the planning area would provide rural to primitive recreation opportunities for visitors to Pima and northeastern Santa Cruz counties. There would be opportunities for both motorized and non-motorized activities and additional exclusively non-motorized trails would be available. Visitors seeking developed recreation sites and other associated recreation infrastructure would not find these recreational opportunities on public lands in the planning area

Implementation of the Las Cienegas Acquisition Strategy would result in acquisition of additional public lands in the planning area which would provide large areas of open space and associated rural to primitive recreation opportunities. The public lands would be protected from future development and managed to maintain these recreation opportunities. Visitors would not be confused by conflicting mandates and differing regulations associated with management of intermixed public lands and State Trust lands. Instead they would receive consistent informational, interpretive, and regulatory messages. Implementation of the strategy would be expected to result in increased public access in the planning area.

## ***Impacts to Outdoor Recreation from Alternative 3***

### **From Desired Resource Conditions**

#### Watershed, Fish and Wildlife, Visual and Resource Management

Impacts under Alternative 3 would be the same as under Alternative 2.

### **From Land Use Allocations**

#### Mineral Development

Mineral development under Alternative 3 would have the same type of impacts on recreation as under Alternative 1. But under Alternative 3 these impacts could occur on a much larger scale and could be much greater.

#### Utility Rights-of-Way and Land Use Authorizations

Impacts under Alternative 3 would be similar to those under Alternative 2, but under Alternative 3 they might occur over a larger area because of the third utility corridor.

#### Off-Highway Vehicle Management

Impacts under Alternative 3 would be the same as under Alternative 2.

#### Recreation Management

Impacts under Alternative 3 would be similar to those described for Alternative 2. The Zone 2 and 3 configuration under Alternative 3 would maintain a more natural or primitive corridor on the main touring road heading north towards the Agricultural Fields. Camping would not be allowed along the corridor unless in a designated spot. Negative impacts along the road would be reduced. And an overall high visual quality and sense of being in a more primitive area would be maintained

#### Arizona Trail

Impacts under Alternative 3 would be the same as under Alternative 2. Livestock Grazing  
Impacts would generally be similar to those

## ***Impacts to Outdoor Recreation from Alternative 3***

described for Alternatives 1 and 2. But under Alternative 3, adverse impacts to recreation settings could increase in drought years if stocking rates are not reduced. Impacts to the recreational settings could include bare soil in camping areas.

### **From Special Designations**

#### Areas of Critical Environmental Concern

Impacts under Alternative 3 would be the same as under Alternative 2.

## ***Cumulative Impacts—Alternative 3 on Outdoor Recreation***

**Cumulative impacts under Alternative 3 would be the same as those under Alternative 2.**

## ***Impacts to Outdoor Recreation from Alternative 4***

### **From Desired Resource Conditions**

#### Watershed, Fish and Wildlife, Visual and Cultural Resource Management

Impacts under Alternative 4 would be the same as under Alternative 2.

### **From Land Use Allocations**

#### Mineral Development

Impacts under Alternative 4 would be the same as under Alternative 2.

#### Utility Rights-of-Way and Land Use Authorizations

Impacts under Alternative 4 would be similar to those under Alternative 2. Not having a designated utility corridor next to the existing El Paso gas line would reduce the need for more service roads. The indirect impact might be the potential for the gas line road to be eliminated over time because new gas line technology might not require a service road. Therefore, a more primitive recreation setting could evolve. But visitors use the service road as access to the



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northern portion of the planning area. If the service road is ever closed, this access would be lost. The existing right-of-way in the planning area's northeast corner could be used for other types of rights-of-way. Impacts from this utility line already exist, and much of this line is not within the prime viewshed. But this line might not conform to Recreation Zone 3 prescriptions because it requires a service road that is used by the public. The road and its use, therefore, reduce the more primitive qualities of desired recreation settings.

### Off-Highway Vehicle Management

Impacts of off-highway vehicle designation under Alternative 4 would be the same as under Alternative 2. The proposed road closures under Alternative 4 would affect some nonmotorized activities. No exclusively nonmotorized routes would be created, and all routes would be shared motorized-nonmotorized use, which is likely to increase user conflicts. Bicyclists and other mechanized vehicle users would have to remain on roads, whereas hikers and horseback riders would not. But no one would be allowed to use former roads designated for closure because they would be undergoing rehabilitation. Therefore, potential nonmotorized routes would be eliminated. Visitors might create new social trails in areas along old roadways.

### Recreation Management

Impacts under Alternative 3 4 would generally be similar to those under the other alternatives. Under Alternative 4, desired recreation settings might be harder to maintain if visitor use increases dramatically. Most of the area would be prescribed for dispersed recreation use, and the least amount of area would be in the more restrictive Zones 1 and 2 (designated camp areas, group areas, and pullouts). Arizona Trail Because the Arizona Trail would be shared use under Alternative 4, motorized-nonmotorized user conflicts would increase if the trail is designated on existing roads. The Arizona Trail

planners might be forced to seek other routes outside public lands in the planning area because the shared use prescription would not meet the trail's goals. Placing the Arizona Trail trailhead at the Empire Ranch headquarters might conflict with Master Plan prescriptions. Overnight parking for the trail might also conflict with the desired settings and goals of the Master Plan.

### Livestock Grazing

Recreation use might increase if livestock grazing is removed from the public lands. Conflicts directly related to cattle grazing would decline, but conflicts with livestock could remain because equestrian recreation might increase. Corrals, water sources, and trails created by cattle might remain and be used by visitors. But maintenance costs of these developments would be transferred to BLM. Requests to hold large or numerous livestock-dependent events would increase. Recreational horseback riding impacts could replace grazing operation impacts on a smaller scale with higher impacts concentrated in popular areas. Increased opportunities for livestock-related and general special recreation permits would result.

## From Special Designations

### Areas of Critical Environmental Concern

Impacts under Alternative 4 would be the same as under Alternative 2.

### **Cumulative Impacts—Alternative 4 on Outdoor Recreation**

**Cumulative impacts under Alternative 4 would be similar to those under Alternative 2. However under Alternative 4, the public lands in the planning area would not provide any additional exclusively non-motorized trails in southeastern Pima County or northeastern Santa Cruz counties for recreationists seeking this opportunity.**

## SPECIAL DESIGNATION AREAS

### Impacts to Wild and Scenic Rivers

**Scope of Analysis:** This section uses impacts to the resources and character of the wild and scenic river study area to compare the impacts of the alternatives on wild and scenic rivers.

#### *Impacts to Wild and Scenic Rivers from Alternative 1 (Current Management)*

Impacts of current management on the wild and scenic river study area and values were analyzed in the Arizona Statewide Wild and Scenic River Legislative Environmental Impact Statement (LEIS) (BLM 1994c).

#### From Desired Resource Conditions

##### Watershed: Upland, Riparian, and Aquatic Vegetation Management

Existing watershed management would continue to protect the wild and scenic river study area and values. Actions that benefit the area have included stream restoration projects, prohibition of fuel wood cutting, and closure of hazardous roads or roads that disturb sensitive riparian areas.

##### Fish and Wildlife Management

Existing fish and wildlife management would continue to enhance Cienega Creek's wild and scenic river values as long as any creek restoration: (1) uses rocks and materials that are neither visually disturbing nor chemically toxic, and (2) assures rehabilitation or naturalizes impacts such as cut tree limbs, stumps, and heavy equipment tracks. Current signing methods should comply with Arizona statewide wild and scenic river guidelines. Visual Resource Management (VRM)  
A Class III VRM designation could allow for some intrusions on the current scenic values of Cienega Creek.

##### Cultural Resource Management

Existing cultural resource management is consistent with protecting wild and scenic river values. Any impacts from data recovery projects in the wild and scenic river corridor could increase bank erosion, which would need to be mitigated. Data recovery projects (i.e., archeological digs) are rare and normally fit in visually and comply with outstandingly remarkable scenic values.

#### From Land Use Allocations

##### Mineral Development

Disturbance from any large-scale mining in the Empire Mountains could impair wild and scenic river values and would be mitigated through the required mining plans of operations. Mitigation for smaller mines should prevent degraded tributaries that could slightly affect Cienega Creek's wild and scenic river suitability.

##### Utility Rights-of-Way and Land Use Authorizations

Under current management, BLM would discourage new transmission lines and natural gas lines within the wild and scenic river corridor. Rights-of-way in this corridor could degrade outstandingly remarkable values. Unauthorized motorized access on closed service roads could allow cumulative harm, including tree and vegetation degradation from unauthorized firewood collecting.

##### Off-Highway Vehicle Management

Continuing use of all existing roads might degrade portions of Cienega Creek where vehicle traffic is now being allowed in the wild and scenic river corridor. This area includes the Narrows and other portions of Cienega Creek used for motorized crossing. Impacts could include erosion, damage to stream banks, and discharged oil or other fluids from motor vehicles crossing or getting stuck in the creek.

## *Chapter 4: Special Designation Areas*

The presence of many existing roads could slightly degrade wild and scenic river values. Too many easily accessible motorized points could encourage cumulative trampling and cutting of vegetation for firewood and cleared ground for dispersed campsites. Roads that dead-end within the wild and scenic river corridor contribute to destination camping spots being located too close to sensitive riparian resources.

### Recreation Management

Lack of recreation management zones would not affect the character of the wild and scenic river corridor or its outstandingly remarkable values.

### Arizona Trail

Lack of designation of a route for the Arizona Trail would prevent attracting a cumulatively large target audience for the trail. But random social trails might develop for lack of a single marketed and designated trail.

### Livestock Grazing

Restricting cattle from most of the wild and scenic river corridor under current management helps protect wild and scenic river values. To protect remarkable and outstanding features, BLM should continue to implement alternative nonintrusive livestock watering techniques out of the creek bed. In addition, BLM should design actions to maintain state water quality standards.

Use of livestock crossing lanes and watering areas impairs some wild and scenic river values. The public's negative perceptions of grazing in a wild and scenic river corridor could be moderate to high. Because Cienega Creek's flow is generally low, livestock manure in the creek from use of lanes and watering areas lowers water quality and might prevent the creek from meeting state water quality standards. Livestock trampling and foraging while using lanes and watering areas would also locally damage riparian areas.

## **From Special Designations**

### Areas of Critical Environmental Concern

Lack of an ACEC designation should not affect a stream's suitability as a wild and scenic because Alternative 1 (Current Management) already mandates management to protect wild and scenic river suitability. Where wild and scenic river mandates might overlap with ongoing actions, the more stringent actions would apply.

## ***Impacts to Wild and Scenic Rivers from Alternative 2***

## **From Desired Resource Conditions**

### Watershed: Upland, Riparian, and Aquatic Vegetation Management

The overall prescriptions for watershed, upland, and riparian areas would help Cienega Creek retain its suitability for wild and scenic river status. Some prescriptions such as burning or cutting trees could temporarily detract from scenic quality within the short-term, depending on visitor perceptions, knowledge, and expectations. General wood cutting would not be allowed in the wild and scenic river study area. Administrative vegetation treatment that involves wood cutting and conforms to stricter VRM classifications by removing, camouflaging, or naturalizing cut stumps (stumps detract from scenic quality) would help maintain values.

### Fish and Wildlife Management

Proposals would maintain wild and scenic river values as long as signing is integrated with the overall interpretive sign program and proposed developments conform to wild and scenic river prescriptions.

### Visual Resource Management (VRM)

The more stringent VRM Class II designation under Alternatives 2, 3, and 4 would better

maintain the values of the wild and scenic river study area than would Alternative 1.

Cultural Resource Management

Any significant archeological excavations within the corridor could harm the resources and character of the wild and scenic river study area if gullying or erosion is not mitigated. Overall, the cultural program is expected to enhance wild and scenic river values.

**From Land Use Allocations**

Mineral Development

The continued closure of most of the public lands and proposed mineral withdrawal would help maintain wild and scenic river values. The potential impacts projected for Alternative 1 would not occur under Alternative 2.

Utility Rights-of-Way and Land Use Authorizations

Designating utility corridors away from the wild and scenic river corridor would help maintain wild and scenic river values and be consistent with the recommended alternative from the Arizona Statewide Wild and Scenic Rivers LEIS (BLM 1994c). The proposed utility corridor in the northeast corner of the planning area would cross the Cienega Creek wild and scenic river corridor, and other lines within this corridor could degrade the scenic values of the wild and scenic river study area.

Off-Highway Vehicle Management

Restricting motor vehicles to designated roads would reduce the potential for perpetuating illegally created roads and would help maintain wild and scenic river values. The proposed road closures would help reduce unneeded roads in the wild and scenic river corridor and would eliminate almost all wet stream crossings.

Recreation Management

The recreation Zone 3 designation recommended for the wild and scenic river

corridor under Alternative 2 would allow dispersed camping, but Alternatives 2, 3, and 4 would not allow camping within the riparian zone. Despite this restriction, wild and scenic river portions within Zone 3 might undergo cumulative harm from dispersed recreation use.

The lack of alternative potable water sources could have cumulative impacts to the creek where hikers and horseback riders trample vegetation to retrieve water. If there are no other potable water sources, Arizona Trail users would seek water from Cienega Creek, treating the water by boiling, filtering, or using chemicals.

Arizona Trail

The Arizona Trail route under Alternative 2 would be compatible with wild and scenic river values. But this nationally advertised trail could bring more people to the area than might otherwise come to the area under BLM's marketing strategy. Even though the Arizona Trail and BLM advocate Leave No Trace land use ethics, a low percentage of people actually follow strict Leave No Trace guidelines. Some portions of the wild and scenic river corridor would be degraded at the following places:

- Where hikers cross the creek.
- At day use rest spots.
- In camping areas.
- Where camp fires are built.

The cumulative impacts are human waste accumulation, lowered water quality, and extensive tree damage, which can occur over time where the trail crosses into the segments of the scenic corridor or in other areas suitable for camping. Trees and other woody plants could be gradually damaged. Impacts occur more often near streams because camping near a creek in Arizona has more attraction to many visitors

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than camping in sacaton grass flats or on rocky hillsides. Restrictions on camping in the riparian zone should minimize but would not eliminate these impacts.

### Livestock Grazing

Impacts under Alternative 2 would generally be the same as under Alternative 1. In the **activity plan proposal livestock grazing management actions**, any water developments where livestock waste could directly come into contact with wild and scenic river creek water should be avoided to maintain high standards for water quality. BLM should consider alternative livestock watering methods. Watering methods should not be obvious or detract from wild and scenic river values.

### **From Special Designations**

#### Areas of Critical Environmental Concern

The ACEC designation would add a layer of importance, perhaps pulling in more management dollars to the area and helping retain wild and scenic river values.

### ***Impacts to Wild and Scenic Rivers from Alternative 3***

### **From Desired Resource Conditions**

#### Watershed, Fish and Wildlife, Visual and Cultural Resource Management

Impacts under Alternative 3 would be the same as under Alternative 2.

### **From Land Use Allocations**

#### Mineral Development

Impacts would be of the same type as under Alternative 1, but would have greater potential and scope under Alternative 3 because areas

outside ACECs would be open to mineral development.

#### Utility Rights-of-Way and Land Use Authorizations

Impacts under Alternative 3 would be similar to those under Alternative 2.

#### Off-Highway Vehicle Management

Impacts under Alternative 3 would be the same as under Alternative 2.

#### Recreation Management

Impacts under Alternative 3 would be similar to those under Alternative 2, but under Alternative 3 some of the wild and scenic river corridor would fall in recreation Zone 2, which might better protect wild and scenic river values because it would restrict camping to designated areas. But because Alternatives 2, 3, and 4 would restrict camping within 100 feet of the stream, the increased protection in this small area would be minor.

#### Arizona Trail

Under Alternative 3, the Arizona Trail corridor would pass through the wild and scenic river corridor and might conflict with maintaining the wild and scenic river values in the Narrows portion of Cienega Creek.

#### Livestock Grazing

Impacts under Alternative 3 would be the same as under Alternative 1.

### **From Special Designations**

#### Areas of Critical Environmental Concern

Impacts under Alternative 3 would be the same as under Alternative 2 because under both alternatives the wild and scenic river study area would be included within ACECs.

***Impacts to Wild and Scenic Rivers from Alternative 4***

**From Desired Resource Conditions**

*Watershed, Fish and Wildlife, Visual and Cultural Resource Management*

Impacts under Alternative 4 would be the same as under Alternative 2.

**From Land Use Allocations**

*Mineral Development*

Impacts under Alternative 4 would be the same as under Alternative 2.

*Utility Rights-of-Way and Land Use Authorizations*

Impacts under Alternative 4 would be the same as under Alternatives 2 and 3.

*Off-Highway Vehicle Management*

Impacts under Alternative 4 would be the same as under Alternative 2.

*Recreation Management*

Impacts under Alternative 4 would be the same as under Alternative 2.

*Arizona Trail*

The Arizona Trail would not pass through the wild and scenic river corridor under Alternative 4 and would not affect wild and scenic river values.

*Livestock Grazing*

Eliminating livestock grazing at the edge of or in the creek would benefit wild and scenic river values. But recreational livestock use might increase and have similar type of impacts.

**From Special Designations**

*Areas of Critical Environmental Concern*

Impacts under Alternative 4 would be the same as under Alternative 2.

**Impacts to Areas of Critical Environmental Concern**

**Scope of Analysis:** This section uses effects on ACEC resources to compare the impacts of the alternatives on ACECs.

***Impacts to ACECs from All Alternatives***

*Impacts to Appleton-Whittell ACEC*

See the discussion of impacts to watershed, upland and riparian vegetation, and fish and wildlife from all alternatives for the impacts to the resources of the ACEC.

Current management is protecting the resources and research use of this ACEC by implementing the proposed management for this ACEC prescribed in the Phoenix RMP (BLM 1987a, 1988) through the existing cooperative management agreement.

Alternatives 2, 3, and 4 would change the name of the ACEC to the Appleton-Whittell Research ACEC to better describe it and communicate its primary use. In addition, all roads on public lands would be restricted to administrative use **and the ACEC would be closed to horseback use.** **This** **These** restrictions would ensure that unauthorized motor vehicle use and horseback use does not interfere with ongoing research projects.

Under Alternatives 2, 3, and 4, any public lands acquired south of the Babocomari Land Grant in the Sonoita Valley Acquisition Planning District would be added to the Appleton-Whittell Research ACEC which would further enhance research values of the area.

## **SOCIAL AND ECONOMIC CONCERNS**

### **Impacts to Population and Demographics**

#### ***Impacts to Population and Demographics from Alternative 1 (Current Management)***

Alternative 1 (Current Management) would not change the population, demographics, and projections for Pima, Santa Cruz, and Cochise counties.

#### ***Impacts to Population and Demographics from Alternatives 2, 3, and 4***

Establishing recreation zones and associated recreation management, including the designated recreation sites, would increase the number of visitors to the planning area but would not change the population and demographics of Pima, Santa Cruz, and Cochise counties.

#### ***Cumulative Impacts--Population and Demographics***

Land tenure shifts influence population and demographics. As more land becomes available for private use and more people move into a rural setting seeking more open space, development would increase. If the surrounding State Trust or private lands are sold, the number of private dwellings surrounding the planning area might increase, but the population, demographics, and projections for Pima, Santa Cruz, and Cochise counties would not change.

### **Impacts to Local and Regional Economies**

#### ***Impacts to Local and Regional Economies from Alternative 1 (Current Management)***

Alternative 1 would not change the local and regional economy.

#### ***Impacts to Local and Regional Economies from Alternative 2***

Increased recreation resulting from proposed

recreation management under Alternative 2 might benefit the local and regional economy.

#### ***Impacts to Local and Regional Economies from Alternative 3***

Impacts under Alternative 3 would be the same as under Alternative 2.

#### ***Impacts to Local and Regional Economies from Alternative 4***

Increased recreation resulting from proposed recreation management might benefit the local and regional economy. But eliminating public land grazing under Alternative 4 would result in a loss of \$129,000 in personal income to the local and regional economy. County revenue might slightly increase if intermixed or surrounding State Trust Lands become private.

#### ***Cumulative Impacts--Local and Regional Economies***

The local and regional economies are slowly shifting from a rural and agriculture economy to a more commercial economy tied to recreation and tourism. The local and regional economies are also benefitting from increased recreational opportunities in the region and increased commerce in the Enterprise Zone.

### **Impacts to Employment**

#### ***Impacts to Employment from Alternatives 1 (Current Management), 2, and 3***

Alternatives 1, 2, and 3 would not change employment.

#### ***Impacts to Employment from Alternative 4***

Eliminating livestock grazing on public lands would likely make ranching operations on two grazing allotments unfeasible and result in the loss of jobs on the two allotments.

*Impacts to Environmental Justice*

None of the alternatives would have disproportionate adverse human health or environmental effects on minority and low-income populations.

**CUMULATIVE IMPACTS**

Cumulative impacts include impacts from the incremental changes from all planned actions when added to other past, present, and reasonably foreseeable changes. Cumulative impacts can also result from individually minor but collectively significant actions taking place over time. When they would occur, cumulative impacts are described at the end of each impact section for each resource or program.

**IRREVERSIBLE OR  
IRRETRIEVABLE  
COMMITMENTS OF  
RESOURCES**

An irretrievable commitment of a resource is one in which the resource or its use is lost for a period of time. An irreversible commitment of a resource is one that cannot be reversed; e.g., the extinction of a species.

The extraction of any locatable mineral ore would be an irretrievable commitment of resources.

Any disturbance to cultural or paleontological resources would be irreversible, and any loss of these resources would be irretrievable.

**UNAVOIDABLE ADVERSE  
IMPACTS**

Unavoidable adverse impacts are impacts that remain following the implementation of mitigation measures, or impacts for which there are no mitigation measures. Some unavoidable adverse impacts will occur as a result of proposed management under one or more of the alternatives. Others are a result of public use of BLM-managed lands within the planning area.

Development of mineral resources could create visual intrusions, soil erosion, and compaction problems, and loss of vegetation cover.

Unauthorized off-road vehicle travel could cause scarring, increased soil erosion, and loss of vegetation cover.

Development of designated recreation sites and trails and development of livestock waters could cause soil compaction, increased soil erosion, and loss of vegetation cover.

Accidental or unauthorized introduction of exotic plant or animal species could result in harm or loss of populations of native plants or animals.

Proposed restrictions on recreation, livestock operations, and other land use authorizations to protect sensitive resources and other values would lessen the ability of operators, permittees, individuals, and groups to use the public lands and could increase operating costs.

**As a result of increased use of Federal Lands within the planning area for international smuggling of undocumented immigrants and controlled substances, much damage is occurring to the natural resources of the Las Cienegas NCA and Planning District particularly along the primary smuggling routes. As an example, damage to the riparian area and**



*Chapter 4: Unavoidable Adverse Impacts*

endangered species habitat at the Narrows of Cienega Creek has occurred repeatedly from removal of numerous vehicles used for smuggling activities which have become mired in the marshy streambed. Other impacts from human caused fires, litter, human waste and off-road travel by vehicles are anticipated to continue to increase dramatically. The increased visitation from smuggling activities

has a cumulative added negative impact when considered with the impacts of legal visitors to the area. The impacts from smuggling activities are considered unavoidable adverse impacts.

Virtually all potential unavoidable adverse impacts are indirect, long-term, and difficult to quantify.

## CHAPTER 5

# CONSULTATION AND COORDINATION



A meeting of the Sonoita Valley Planning Partnership.

# CHAPTER 5

## CONSULTATION AND COORDINATION

### INTRODUCTION

BLM's work on the Empire-Cienega Integrated Management Plan--an amendment to the Phoenix Resource Management Plan (RMP)--involved two major phases. During the first phase BLM officially began work on the plan amendment on March 24, 1989, with a *Federal Register* Notice of Intent to prepare a plan amendment/environmental impact statement. A 30-day scoping comment period followed scoping meetings on April 11 and 12, 1989, in Sonoita and Tucson, Arizona. BLM received 98 responses, including 60 comment letters and 38 letters requesting more information as it became available. BLM then formulated the planning issues and criteria and, on July 20, 1990, mailed an RMP amendment update to the public. Enclosed were the issues and planning criteria. The comment period on the criteria and issues ended on August 20, 1990.

BLM suspended the planning effort in December 1991 when it administratively transferred the lands under consideration from its Phoenix District to its Safford District. Due to the change in administration of the Empire-Cienega lands, BLM's Safford District restructured the planning effort to the Safford RMP and held the following public meetings:

- December 15, 1992 in Eloy, Arizona
- December 16, 1992 in Elgin, Arizona
- December 17, 1992 in Tucson, Arizona

At these meetings the BLM's interdisciplinary planning team presented details on the three

alternatives that it had drafted for the Empire-Cienega Planning Area.

BLM again put the plan amendment on hold while it undertook several large projects, including the Arizona Wild and Scenic Rivers EIS in 1993-1994. BLM also worked on other agency reorganizations which resulted in more organizational changes for the BLM's Tucson Office. During this time, BLM as an agency was changing and was placing new emphasis on ecosystem approaches to planning and management.

In 1995, BLM began the second phase of work on the Empire-Cienega plan amendment. Because it was managing lands administered by the new Tucson Field Office, but managed under both the Phoenix and Safford RMPs, BLM decided to return to the approach of amending the Phoenix RMP in completing an RMP amendment for the Empire-Cienega Planning Area. These lands were within the old Phoenix Planning Unit, and an appendix to the Phoenix RMP included interim management guidance for the Empire-Cienega Planning Area.

BLM's Tucson Field Office decided to take a new collaborative approach to the plan amendment. This approach led to the forming of the Sonoita Valley Planning Partnership (SVPP). SVPP is an informal, voluntary association of public and private participants (federal, state, and local agencies, organized groups, and individuals) who share a common interest in the future of public land resources in the Sonoita Valley. The mailing list for the earlier work on the plan amendment became a source for generating invitations to participate in the community potluck and workshop that led to the creation of this partnership.

## **PUBLIC INVOLVEMENT AND CONSULTATION**

### **PUBLIC MEETINGS/OPEN HOUSES**

BLM conducted scoping during Phase 1 of the Empire-Cienega Plan Amendment through a series of public open houses:

April 11, 1989--Sonoita, Arizona

April 12, 1989--Tucson, Arizona

BLM conducted more scoping in Phase 2 of the planning effort during the community potluck, community workshop, and the first meetings of the working groups of the Sonoita Valley Planning Partnership as detailed in the following chronology.

### **Sonoita Valley Planning Partnership Chronology**

In January 1995, BLM brought together people from federal, state, and local agencies with an interest in the Sonoita area to discuss forming a partnership to work with the community on public land issues. All participants had a strong interest in the valley. This meeting was followed by a community potluck in April 1995. Agencies and groups were then invited to put up displays of their activities in the Sonoita area. Participants toured sites in the valley and filled out questionnaires on their concerns for the valley's future.

In July 1995, the Sonoita Valley Planning Partnership held a community workshop to review the questionnaire results and discuss other Sonoita Valley issues. Workshop participants decided to have the partnership deal only with issues involving public lands surrounding the Sonoita Valley and to defer issues of growth management and private land concerns to another effort. They formed three working groups to confront issues relating to:

(1) wildlife-vegetation, (2) water-minerals, and (3) people.

The working groups met monthly from August to December 1995. During this time the working groups developed desired future condition descriptions: visions, goals, and objectives for upland vegetation, riparian vegetation, aquatic habitats, fish and wildlife, cultural resources, and recreation opportunities.

In December 1995, the working groups gave a joint presentation on their visions, goals, objectives, and categorization of issues. Group members also decided to merge the water-minerals and wildlife-vegetation groups into a natural resources working group and to continue to meet monthly. The Sonoita Valley Planning Partnership defined its area of concern as roughly the Cienega Creek watershed south of Interstate 10 and small portions of the upper watersheds of Sonoita Creek and the Babocomari River.

From January to September 1996, the working groups met monthly. They refined resource objectives. They participated in technical presentations on fire management, wildlife management, grasslands, riparian vegetation and cultural resources. They worked on the preliminary development of management strategies.

In September 1996, the groups gave another joint presentation on achievements in objectives and management strategies and decided to have all working groups meet together to finalize their objectives and develop alternative management strategies. From November 1996 to May 1997, the Partnership in monthly meetings refined and agreed on the wording of their resource objectives, which they wrote so that managers or owners could apply them to any lands within the Partnership's focus area in the upper Cienega Creek basin.

From June 1997 to October 1998, the Partnership's monthly meetings focused on developing and refining alternative management strategies to resolve issues and meet the resource objectives, mainly on the public lands within the planning area. In addition, several new subgroups were formed to work on the details of proposals and report back to the Partnership at regular monthly meetings.

From December 1998 to February 1999, the Partnership worked on achieving consensus on a preferred series of management strategies out of the alternative strategies it had developed.

From March 1999 to February 2000, the Partnership met four times (February, May, and September 1999 and February 2000) to develop a monitoring program for the Empire-Cienega Planning Area.

**Dates of SVPP Meetings**

***Community Potluck:***

April 22, 1995

***Community Workshop:***

July 22, 1995

***Wildlife/Vegetation Working Group and Water/ Minerals Working Group Meetings:***

August 19, 1995

September 16, 1995

October 14, 1995

November 11, 1995 (Wildlife/Vegetation)

November 18, 1995 (Water/Minerals)

December 9, 1995 (Joint Meeting of all Three Working Groups)

January 6, 1996 (Wildlife and Vegetation and Water and Minerals Working Groups are Combined)

February 10, 1996

March 9, 1996

April 13, 1996

June 8, 1996

July 20, 1996

August 10, 1996

September 14, 1996 (Joint Meeting of Two Working Groups)

***People Working Group Meetings:***

August 26, 1995

September 23, 1995

October 22, 1995

November 18, 1995

December 9, 1995 (Joint Meeting of Three Working Groups)

January 13, 1996

February 10, 1996

March 9, 1996

April 13, 1996

June 8, 1996

July 20, 1996

August 10, 1996

September 14, 1996 (Joint Meeting of Two Working Groups)

***Planning Partnership Monthly Meetings:***

November 9, 1996

January 11, 1997

February 8, 1997

March 8, 1997

April 12, 1997

May 10, 1997

June 14, 1997

July 12, 1997

August 9, 1997

September 13, 1997

October 11, 1997

November 8, 1997

January 10, 1998

February 14, 1998

***Planning Partnership Monthly Meetings (continued):***

March 14, 1998

April 11, 1998

May 30, 1998

June 13, 1998

July 11, 1998

August 8, 1998

September 19, 1998

October 17, 1998

*Chapter 5: Public Involvement and Consultation*

December 12, 1998  
 January 9, 1999  
 January 26, 1999  
 February 12, 1999  
 February 19, 1999  
 August 1999

***Recreation Subgroup Meetings:***

December 3, 1997  
 January 10, 1998  
 February 14, 1998  
 March 26, 1998  
 May 9, 1998  
 June 27, 1998  
 July 7, 1998  
 July 23, 1998  
 August 25, 1998

***Monitoring Subgroup Meetings:***

February 26, 1999  
 May 6, 1999  
 September 17, 1999

February 10, 2000 (Technical Workshop)

**Coordination with State and Federal Agencies**

BLM coordinated with the federal and state agencies listed in Table 5-1 while developing the draft plan.

Throughout the planning and EIS process, BLM will continue to coordinate and consult with the State Historic Preservation Office (SHPO) on identifying and treating cultural resources and with the U.S. Fish and Wildlife Service on potential impacts to threatened and endangered species.

**Table 5-1  
 State and Federal Agencies Contacted for the Empire-Cienega Integrated Management Plan**

<b>State Agencies</b>	<b>Federal Agencies</b>
Arizona Department of Environmental Quality	U.S. Department of Defense, Fort Huachuca
Arizona Department of Water Resources	USDA Forest Service, Coronado National Forest*
Arizona Game and Fish Department*	U.S. Geological Survey*
Arizona State Historic Preservation Office	USDA Natural Resource Conservation Service*
Arizona State Land Department*	USDI Fish and Wildlife Service*
Arizona State Parks Department*	USDI National Park Service, Coronado National Memorial

\*Agencies whose representatives were active participants in the Sonoita Valley Planning Partnership.

**Table 5-2  
Tribal Governments Contacted for the Empire-Cienega Integrated Management Plan**

Ak-Chin Indian Community	Salt River Pima-Maricopa Community
Gila River Indian Community	San Carlos Apache Tribe
Members of the Hopi Tribe	Tohono O’Odham Nation
Mohave-Apache Tribal Council	Yavapai-Apache Tribe
Pascua Yaqui Council	White Mountain Apache Tribe

**Coordination with Tribal Governments**

While developing the draft plan BLM coordinated with the tribal governments or members of the communities, tribes, and nations listed in Table 5-2.

**PUBLIC OUTREACH**

Public outreach included presentations by members of the planning team to: Region 5 of the Arizona Game and Fish Department, Arizona Game and Fish Commission, Arizona State Land Department, BLM Resource Advisory Council, Arizona Department of Water Resources, Arizona Game and Fish Commission’s Heritage Public Advisory Committee, Empire Ranch Foundation, Green Valley High 12 Club, Society of Environmental Journalists, Sonoita Crossroads Community Forum, Natural Areas Association Conference, Alternative Dispute Resolution Conference, and Conference on Research and Management in the Southwest. BLM also led several tours for Arizona Senate and congressional representatives.

**LIST OF PREPARERS**

**TUCSON FIELD OFFICE**

**Bill Auby, Geologist**

B.S., Geology/Geophysics, University of Wisconsin, Madison. M.S., Geology, Northern Illinois University. Bill has worked for 8 years with the BLM. He prepared the geology, mineral development, and hazardous materials portions of the draft plan.

**Susan Bernal, Realty Specialist**

B.S., Regional Development, University of Arizona. Susan has worked for the BLM for 4 years. She prepared the lands sections of the draft plan, including utility rights-of-way and land use permits.

**Vic Brown, District Ranger**

B.A, Geography and Geology. Vic has 22 years of federal service with the National Park Service as a park ranger and with BLM as a district ranger. He provided input on resource, recreation, law enforcement, and regulations for the draft plan.

**Grant Drennen, Range Specialist**

B.S., Range Science/Watershed, Utah State University. Grant has 22 years of service with the BLM. He prepared the upland vegetation, fire, and livestock grazing sections of the draft plan.

**Francisco Mendoza, Outdoor Recreation Planner**

B.S., Landscape Architecture, University of Arizona. Francisco has 19 years of service with BLM. He helped with the input and analysis of GIS data and the preparation of GIS maps for the draft plan.

**PARTICIPANTS<sup>1</sup> IN THE SONOITA VALLEY PLANNING PARTNERSHIP**

**Federal, State, and Local Agencies**

Bureau of Land Management, Tucson Field Office and Arizona State Office  
Coronado National Forest, Nogales and Sierra Vista Ranger Districts  
Natural Resource Conservation Service, Tucson Office  
U.S. Fish and Wildlife Service, Arizona Ecological Services Offices  
U.S. Geological Survey, Tucson Office  
Arizona Game and Fish Department  
Arizona State Land Department  
Arizona State Parks  
Pima County Flood Control, Parks and Recreation, and Planning and Zoning  
Santa Cruz County Planning and Zoning

**Organizations, Institutions, Businesses**

(Generated from affiliations expressed by individual participants<sup>1</sup>. These individuals may or may not have been officially representing the organization, institution, or business).

AEPCO  
Appleton-Whittell Research Ranch  
Arizona State Association of 4WD Clubs  
Arizona State University, Dept. of Plant

Biology,  
Arizona Trail Association  
ASARCO  
County Line Riders of Catalina  
El Paso Natural Gas  
Empire Ranch  
Empirita Ranch  
Empire Ranch Foundation  
Friends of Pronatura  
High Haven Ranch  
Huachuca Hiking Club  
Phoenix Zoo  
Pima NRCO  
Rose Tree Ranch  
Sierra Club, Rincon Group  
Sky Island Alliance  
Sonoita Bird Dog Club  
Sonoita Crossroads Community Forum  
Sonoita--Elgin Emergency Services  
Sonoran Institute  
Southern Arizona German Shorthair Pointer Club  
Southern Arizona Mountain Bike Association  
The Nature Conservancy  
Tucson Saddle Club  
Vera Earl Ranch  
University of Arizona, Cooperative Extension  
University of Arizona, School of Renewable Natural Resources

**Individuals**

Individual participants<sup>1</sup> came from the following Arizona communities: Benson, Elgin, Green Valley, Huachuca City, Mesa, Nogales, Phoenix, Sierra Vista, Sonoita, Tempe, Tucson, and Vail.

**Mailing List**

In addition to the above participants, persons and organizations from the following communities are on the Sonoita Valley Planning Partnership mailing list.

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<sup>1</sup>Participants are defined as having attended at least one meeting or contacted the Planning Partnership at least once via mail or e-mail.



*Chapter 5: Participants in the SVPP*

**ARIZONA:**

Amado, Apache Junction, Bisbee, Camp Verde, Claypool, Hereford, Ft. Huachuca, Gilbert, Glendale, Kingman, Lakeside, Morenci, Parker, Patagonia, Peach Springs, Safford, Sahuarita, San Carlos, Scottsdale, Sells, Wilcox.

**OTHER:**

San Bernadino, CA; Bishop, CA; Washington, DC; Rockville, MD; Picayune, MS; Santa Fe, NM; Isopus, NY.

## *Chapter 5: List of Preparers*

### **Catie Fenn, Outdoor Recreation Planner**

A.A., Natural Sciences, Pima Community College; B.S., Resource Management, Northern Arizona University. Catie has 9 years of experience with BLM, 9 years with the National Park Service, and 4 years with the Forest Service. She prepared the outdoor recreation, visual resources, and wild and scenic rivers portions of the draft plan.

### **Mark Fredlake, Wildlife Biologist**

B.S., Wildlife Biology, Arizona State University. Mark has worked for BLM for nearly 23 years. He prepared the wildlife portions of the draft plan.

### **Karen Simms, Ecosystem Planning Team Leader**

B.S., Zoology, University of California, Davis; M.S., Wildlife Biology, University of Arizona. Karen has 11 years of experience with BLM. She served as team leader for the BLM interdisciplinary team that prepared the draft document and was the community facilitator for the Sonoita Valley Planning Partnership, which worked with BLM on developing goals and objectives for the Sonoita Valley and in developing management proposals and generating alternatives for consideration.

### **Max Witkind, Archaeologist**

B.A., Technical Journalism and M.S., Anthropology, Colorado State University. Max has worked for the BLM for 16 years in Colorado and Arizona and for 5 years with the Army Corps of Engineers in Arkansas. Before his government service he taught cultural and physical anthropology at San Antonio College in Texas (1971-1979). He prepared the cultural and paleontological resources sections of the draft document.

## **ARIZONA STATE OFFICE**

### **Jeff Simms, Fishery Biologist**

B.S., Fishery Science, University of Arizona;

M.S., Fishery and Wildlife Science, University of Arizona. Jeff has worked for the BLM for 9 years in the Safford and Tucson Field Offices and is now assigned to the Arizona State Office. He prepared the watershed, riparian, and fisheries sections of the draft document.

### **Jim Renthal, Natural Resources Specialist**

B.A., Psychology, University of Chicago; M.S., Watershed Management, University of Arizona. Jim has worked for the BLM for 23 years in Arizona, Idaho, and Oregon. He prepared the air quality, water quality, and portions of the watershed sections of the draft document.

### **Gina Ramos, Natural Resource Specialist**

B.S., Range Science, New Mexico State University, M.B.A., University of Phoenix. Gina has 19 years of service with the BLM. She prepared the socioeconomic, environmental justice, and noxious weeds section of the draft plan.

## **NATIONAL TRAINING CENTER**

### **Ken McGinty, Writer-Editor**

B.A., History, Duke University; M.A., Geography, Clark University. A BLM writer-editor for 25 years, Ken edited the draft document.

## **TUCSON FIELD OFFICE SUPPORT**

### **Mary Farber, Biological Technician**

A.A., General Studies, Pima Community College. Mary is currently obtaining a B.S. degree in Wildlife and Fisheries Science from the University of Arizona. She has worked with the BLM for 1½ years, helping prepare for public meetings, preparing meeting minutes, conducting mailings, and performing other support tasks.

# CHAPTER 6

## PUBLIC COMMENTS AND RESPONSES



Great horned owls are one of several raptors to successfully nest along Empire Gulch.

Chapter 6: Public Comments and Responses

Letter 1

August 18, 2001

Bureau of Land Management  
Tucson Field Office  
12661 E. Broadway  
Tucson, Az. 85748-7208

Draft Las Cienegas Resource Management Plan and Environmental Impact Statement  
Comments:

1 - 1 | I believe the Alternate #2 & #4 Land Designation of Area of Critical Environmental Concern for the entire Reserve is totally un-called-for. On top of this you also include 75,000 acres of State Land. This will open the door for some over zealous administrator to close the entire area to protect some Endangered Species etc.

In the past several years a small group of radical environmentalists, who represent 2% of the population, have successfully closed vast areas of our Country, using the Endangered Species Act, Roadless Areas, Wildlands, Mounments, Parks and Scenic Rivers etc. These actions deny citizens access to Public Lands and "lockup" our Natural Resources. The latter is a serious threat to our Nations security.

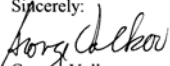
1 - 2 | The most aggressive Land Designation should not exceed Alternate #3.

1 - 3 | In your description of recreational Zones, Zone #3 should contain a description of those activities which are allowed. Such as: primitive camping (14 day maximum), OHV (on marked trails), hunting (under State Regulations), rockhounding, hiking, horseback riding, bicycling, sightseeing, birdwatching and photography.

1 - 4 | The Public Lands were set to be multi-use, and they keep getting more restrictive every year .

1 - 5 | I feel it is necessary to spell out the uses, as there is always someone who would take them away. Don't leave it to interpretation.

I appreciate the opportunity to comment, and will continue to study the document. I plan to attend one or more of the open houses.

Sincerely:  
  
George Volker  
803 W. Annandale Way  
Tucson, Az. 85737  
Ph 797-2659  
Email gv2406@aol.com

**RECEIVED**  
AUG 28 2001  
TUCSON FIELD OFFICE

- 1 - 1. Your comment has been noted.
- 1 - 2. Your comment has been noted.
- 1 - 3. Text has been added to Chapter 2: Recreation Management Actions Common to Alternatives 2, 3, and 4 section & Appendix 2 describing allowable dispersed recreation activities and restricted activities. Table 2-26, Section 3 was intended to describe the basic recreation opportunities available and compatible to an area such as Las Cienegas NCA. Listing all recreational activities in various combinations not specifically listed in the table would not be practical. However, review of the activities listed in the Recreation Management Information System (RMIS) which has been added to Appendix 2 and restricted activities can help visitors reasonably assess which recreation opportunities and settings are available in each zone.
- 1 - 4. As population grows, the demand for use of public lands increases. As a result, some level of restrictions may be needed in order to have sustainable resources in the areas where they were put in place. However, there are still millions of acres of public lands available for a variety of multiple use activities including those within the Las Cienegas NCA.
- 1 - 5. See response 1-3

Chapter 6: Public Comments and Responses

Letter 2, Page 1

September 14, 2001  
1922 E. Orion Street  
Tempe, AZ 85283

**RECEIVED**  
SEP 17 2001  
TUCSON FIELD OFFICE

Mr. David McInay, Acting Manager  
BLM Tucson Field Office  
12661 E. Broadway Road  
Tucson, AZ 85748

Dear Mr. McInay,

I am writing to comment on your draft resource management plan (RMP) and environmental impact statement (EIS) for the Las Cienegas National Conservation Area (NCA) and Sonoita Valley Acquisition Planning District. My comments will be limited to the plan's livestock management proposals.

As you may know, over the last several years I have attended several of the periodic biological planning meetings hosted by the Donaldson's. They have certainly exhibited, as lessees of the Empire-Cienega grazing allotment, a concern for this area's unique natural resources, and a willingness to participate in a public planning process. And I understand the value of the collaborative and adaptive features of these meetings.

But I still worry about how well this system would work if some other, less cooperative, people were the lessees. That's because the bottom line is that, after they listen to all the people that come to their meetings, they are still the ones that make most of the decisions about how many cattle are on the allotment and when they'll be moved.

What I'm trying to say is that I support your proposal to implement the biological planning process on all of the NCA's allotments. But only if you outline some specific regulatory boundaries within which they are required to operate. Fortunately, you have included some in your proposed action, Alternative 2.

The most important one, I believe, is your proposal to establish a conservative maximum upland forage utilization standard of 30-40%. If livestock numbers were set variably to comply with this utilization standard, as you propose, I think it would be a great improvement. As Professor Holechek explained in his 1999 article, higher forage utilization levels result in rangeland deterioration in desert grasslands like these.

But I still think you need to identify a maximum number of permitted cattle for each allotment. That way, if something goes wrong with the biological planning meetings, there won't be too many cattle out there. I suggest that the maximum number permitted should at least be adjusted downward so that estimated forage utilization would not exceed 35% in a favorable precipitation year.

Identifying the appropriate allowable maximum forage utilization level, however, is also a function of how forage use is measured. The EIS states that, "The available forage is assumed to be 50% of the total vegetation produced multiplied by the 35% utilization rate on land allocated for livestock grazing." Huh? Can you please give a clearer explanation of the method you are using to calculate available forage?

Compliance with the forage use maximum, of course, should not be the only control upon livestock utilization levels. I support your proposals to leave extra groundcover in pronghorn antelope fawning, and grassland sparrow areas. But I suspect that the local quail population could also benefit from more standing ground cover. The EIS states that three species of quail are found on the NCA. Research has shown that a minimum 6 inch stubble height must be maintained to allow quail to prosper (Brown

2 - 1. To clarify, even with the use of the Biological Planning Process in Alternative 2, the BLM Field Manager makes the decisions regarding the grazing use on the public lands in the planning area including the maximum number of livestock that can be run and the flexibility of the rotation of the cattle through the pastures on the ranch. . The Biological Planning Team (BPT) will help the Bureau review the monitoring data and provide input into proposed actions. The Bureau will make the decisions after review of existing data and after consultation and coordination with the BPT and other interested agencies and public.

The Bureau is considering having the Tucson Field Manager request that the BPT be established as a separate Rangeland Resource Team (RRT) operating under the auspices of the Arizona Resource Advisory Council (RAC) as provided for in 43 CFR 4100. Text has been added to Alternative 2, Livestock Grazing Management Actions describing this proposal.

2 - 2. The Bureau operates under 4100 CFR Grazing Administration. Upper limits for livestock numbers have now been established for each of the alternatives, along with the established utilization limit. The change establishing an upper limit for livestock numbers for Alternative 2 has been made in Tables 2-4, Table 2-12, and Tables 2-15 through 2-19 and in the livestock management sections of the Land Use Plan proposals for each alternative. This decision is in accordance with Section 4110.2-2 CFR.

## Chapter 6: Public Comments and Responses

### Letter 2, Page 1 (continued)

- 2 - 3. Forage allocation for livestock grazing is a very complicated process. It is dependent on many variables (health of the plants, amount and timing of precipitation, size and condition of the animals, the composition of the plant community, etc.). This difficulty is the primary problem facing “proper management” of the proposed grazing operations. The number of cattle that can be grazed at any particular time varies because the production varies. To try and show this we picked a simplified set of circumstances and compared the vegetation production and the associated forage consumption by cattle at stocking rates in favorable, average, and unfavorable years of vegetation growth. The point was not to evaluate the accuracy of the stocking rate or utilization rate, but to show that only by varying the stocking rate annually can we ever expect to avoid overstocking the range, particularly in the unfavorable years. Even at conservative stocking rates overgrazing is likely to occur during the drought years, and this is when the health of the range is most adversely affected.

For our example we only allowed one-half the current year’s vegetation production that is available (accessible) to be considered in the forage allocation for cattle (the rest is left for watershed protection, general wildlife, etc.). The amount of useable production (forage allocated) for livestock is then determined by multiplying half the total production by the utilization limit. The resulting pounds of vegetation production are the forage allocated for livestock in the scenarios presented in the tables. Thus in Table 2-24 in a favorable year only 15% of the production was made available as forage at the 35% use rate (100% - (50%-35%)) and of the 15% allowed, only 11% of the total production or 64% of the amount allocated at the 35% use rate was consumed.

- 2 - 4. Through the biological planning process, if monitoring indicates an issue with quail habitat quality, a specific objective could be developed in the future. BLM has acquired a recent Arizona Game & Fish Department (AGFD) publication on the effects of human activity and habitat conditions on Mearn’s quail populations. This research suggests that grass cover somewhere in the range of 50% to 75% is optimum for Mearn’s quail (the most sensitive of the three quail species to changes in grass cover). BLM is currently coordinating with AGFD on the use of a visibility obstruction board to assess quail habitat conditions. If this technique proves useful it will be incorporated into the monitoring program, in addition to monitoring that is proposed for wildlife species and habitat.

Citation: Bristow, K. D. and R. A. Ockenfels. 2000. Effects of human activity and habitat conditions on Mearn’s quail populations. Ariz. Game & Fish Depart. Research Tech. Bulletin No. 4, Phoenix. 27 pp.

Chapter 6: Public Comments and Responses

Letter 2, Page 2

1982). Will consideration of quail habitat quality be incorporated into the identification of appropriate upland forage use levels?

2 - 5 I also support your proposals to further limit livestock access to the NCA's important riparian areas. The EIS explains that you are proposing to exclude livestock from more stretches of Cienega Creek, and this is good. But I couldn't find where it shows how much of the perennial portion of the stream will still be grazed by cattle. Can you please summarize the amount of livestock grazing that would still be allowed in the stream with the implementation of your proposed action?

2 - 6 Also, why are you proposing to allow the cattle to stay in the stream crossing lanes for up to 21 continuous days? I find it difficult to believe that it's necessary to allow them in there that long just so they can cross the stream to another pasture. The EIS explains that there are currently six of these crossing lanes, and that two more are proposed. Why is it necessary to create two more of them?

2 - 7 Furthermore, why should these crossing lanes be exempt from the requirement to exclude cattle from southwestern willow flycatcher habitat during the bird's breeding season?

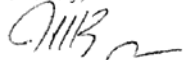
2 - 8 I also don't understand why you are proposing to continue to allow the Cinco Ponds pasture of the Empire-Cienega allotment to be grazed during the summer. For that matter, none of the NCA's riparian areas should be grazed during the warm season. The EIS shows that a riparian habitat assessment conducted in 2000 found that 33% of Cienega Creek and 61% of Empire Gulch still had not achieved proper functioning condition. Can you please specifically identify all the riparian areas that would be grazed during the summer under your proposed action, and whether or not they are currently in proper functioning condition?

2 - 9 Finally, there's your proposal to establish a new livestock grazing allotment on the currently ungrazed BLM lands in the Empire Mountains. I understand that the NCA's enabling legislation states that you "shall permit" livestock grazing. But it also says that it should only take place in "appropriate areas" and be subjected to all applicable laws and regulations. Trying to graze livestock in mountains doesn't make any sense to me and I believe the area should be classified as unsuitable for grazing.

2 - 10 Moreover, who's going to pay for the fences and livestock watering devices that would be needed to adequately manage grazing on the new allotment? I don't think it's right for the taxpayers to have to pay to start up a private ranching operation. At the very least, the new permittee should be required to build and pay for any necessary range "improvements" before cattle would be permitted on the allotment. (And they shouldn't be allowed to use Arizona Water Protection Fund, EPA Section 319 grants, or other public monies to do it.)

Thank you for this opportunity to participate, and please keep me updated on the status of this project.

Sincerely,



Jeff Burgess  
Ph 602-417-4486 (day)  
E-mail: jburgess@grazingactivist.org

2 - 5. The situation with the livestock watering areas and crossing lanes has been confusing and some changes have been made since the Draft Plan. This information has been clarified and is summarized in Table 2-25 and shown on a new map, Map 2-19A. Alternative 2 proposes to eliminate the Bahti, Rick's, and Jesse lanes and replace them with a lane "hardened" with gravel where the old agricultural fields road crosses Cienega Creek. This results in two fewer livestock lanes than under current management. Thus Alternative 2 (preferred alternative) proposes six lanes (Headwaters, Gardner, Old Road, Fresno, and Dominguez on Cienega Creek and one on upper Empire Gulch). Each lane is about 300 yards long, and the total acreage of all six lanes represents about 2.7% of the total riparian area of Cienega Creek. The lanes could be used for up to 21 days a year, although past use has been less often and usually all lanes are not used each year depending on the selected rotation.

The A & B watering area (0.5 mile) on Cienega Creek would have to remain until an alternative upland water could be created to provide water on the west side of the creek. The other watering area at the Cienega Creek Narrows (1.5 miles) would remain until other solutions can be developed as reliable sources of upland water are not present. Use of A & B riparian watering area occurs predominately during the non-growing season (between December 1-May 1, depending on the cattle rotation for that year). Use of the A & B

## *Chapter 6: Public Comments and Responses*

### Letter 1, Page 2 (continued)

- 2 - 5. (continued)  
pastures is rotated to provide periodic rest of each area from grazing. Use of the Narrows riparian watering area occurs in the winter-spring (between December 1-April 1, depending on the cattle rotation for that year). The riparian watering areas are about 8.6% of the total riparian area of Cienega Creek.
- 2 - 6. The 21 days is primarily needed in the spring when the cows have their young calves with them. The cattle are moved across the creek in groups as they are rounded up. It is critical, if the calves are not weaned from their mothers, to make sure they are “paired up” prior to pushing them across the creek. In the fall and winter this is not a problem and they can cross much more quickly.
- 2 - 7. Livestock management actions will be consulted on during the formal Section 7 consultation with the U.S. Fish and Wildlife Service for this land use plan. Livestock management is not exempt from Endangered Species Act consultation requirements.
- 2 - 8. See response 2-5 above. The six crossing lanes could be grazed during the summer months depending on the livestock rotation. Currently the stream segments supporting the Headwaters, Gardner, Fresno and Dominguez lanes and the new Empire Gulch lane are in proper functioning condition. The old road lane is in the Agricultural fields segment which is functional at risk due to on-going stream restoration efforts. The recreation crossing lane (for the AZ trail) is also in this segment. The A&B pastures just downstream of the Ag fields are also functional at risk. The three segments of Cienega Creek partially included in the Narrows watering area are a combination of PFC and Functional at Risk. The Functional at Risk ratings for these segments is due to sediment loads from side drainages in the uplands and is currently being evaluated.
- 2 - 9. This alternative was analyzed because grazing was occurring on the private land in the Empire Mountains prior to its acquisition by the BLM. When BLM acquired lands in the area there was no existing grazing lease to honor. Cattle grazing continued, but was determined to be in trespass and an order was issued to remove all livestock from the federal lands. The livestock operators submitted applications for the “legal” grazing of these public lands and the authorized official made a decision that BLM could not authorize grazing until the issue was analyzed in the Land Use Plan and EIS. As a result, establishing a grazing allotment in the Empire Mountains was made an alternative. At that time there was no known opposition to the proposal and the operators had leases from many of the owners of adjacent, private land. Therefore, grazing was included as part of the Preferred Alternative. Because of the intermixed ownership, which complicates management of livestock grazing on public lands in the Empire Mountains, there is a list of conditions which must be met before grazing use would be activated. These conditions include stipulations to protect rangeland health. If the conditions are not met within five years of the Record of Decision (ROD) on the plan, then BLM will reassess the decision and may reallocate the forage to watershed. Text has been added to Chapter 2: Livestock grazing management actions for Alternatives 2 and 3 summarizing the stipulations.



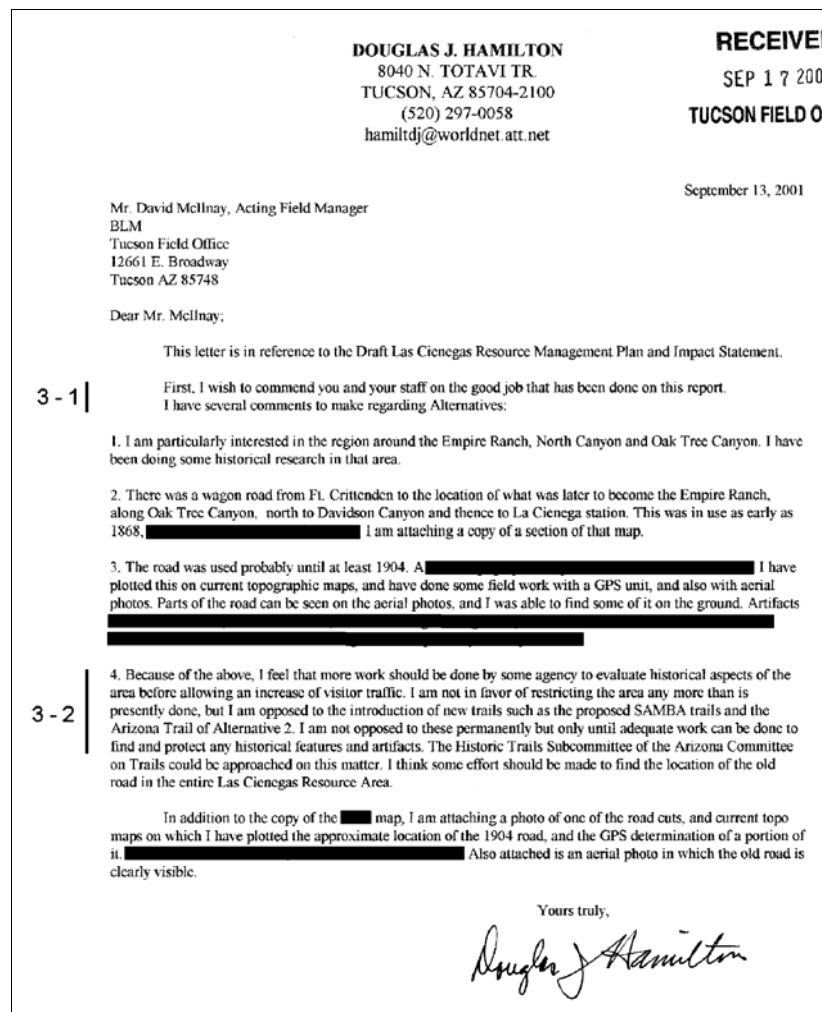
*Chapter 6: Public Comments and Responses*

Letter 1, Page 2 (continued)

- 2 -10. Adequate range improvements, such as fences and waters, must be built in the Empire Mountains as one of the conditions prior to activating grazing use. In order to implement a grazing program that would have enough pastures to provide adequate rest periods from grazing, many improvements would have to be constructed on private lands not owned by the grazing operator. Rights-of-way and agreements would be required, grazing and trailing through subdivisions would be necessary. Activation of grazing use, and then profitably utilizing a grazing allotment would potentially be very expensive. The rancher would be responsible for all of the labor and material on private and state lands. The Bureau might consider buying some material for the fences on public lands, but the water developments and labor would all be the responsibility of the rancher.

Chapter 6: Public Comments and Responses

Letter 3



- 3 - 1. Thank you for your comment.
- 3 - 2. The wagon road described in your letter is not identified in this EIS for future recreational development or use by the Arizona Trail or North Canyon non-motorized trail. Normal planning procedures call for Class III cultural resource surveys to be conducted on all trails and roads proposed for use in the LCNCA. This inventory would include a thorough search of historical files, records, documents and maps which might show or indicate the locations of historical trails and roads leading through the NCA. Then, an archaeologist would walk the entire route and document any cultural resources found along the way. Impacts could be avoided by routing the trail or road around archaeological sites and features, or mitigated by data collection. In compliance with the National Historic Preservation Act the BLM would consult with the Arizona State Historic Preservation Office (SHPO) on plans, designs and construction which might impact such trails or roads. *(Note: specific descriptions of sensitive cultural sites and detailed maps submitted with this comment letter have been redacted in order to protect these resources by not disclosing their location.*

Chapter 6: Public Comments and Responses

Letter 4, Page 1

September 24, 2001  
1922 E. Orion Street  
Tempe, AZ 85283

RECEIVED  
SEP 24 2001  
TUCSON

Mr. David McInay, Acting Manager  
BLM Tucson Field Office  
12661 E. Broadway Road  
Tucson, AZ 85748

Dear Mr. McInay,

Earlier this month I submitted written comments on your draft resource management plan (RMP) and environmental impact statement (EIS) for the Las Cienegas National Conservation Area (NCA) and Sonoita Valley Acquisition Planning District. Those comments were limited to the plan's livestock management proposals. These supplemental comments are limited to the ecological restoration of Cienega Creek in the area of the old agricultural fields, near the old Cienega Ranch.

As you know, in the 1970's these fields were being farmed and a diversion canal was dug upstream to protect them from large flood events. It diverted flood waters around the eastern side of the fields and dumped the water downstream into lower Mattie Canyon. Three dams were also built adjacent to these fields in Cienega Creek itself in order to create small irrigation reservoirs. That poorly conceived agricultural enterprise ultimately failed and your agency eventually acquired ownership of the property.

But, unfortunately, you found that the diversion canal and the dams had drastically altered the hydrology of this stretch of Cienega Creek. The diversion canal was capturing a portion of Cienega Creek's regular flow, so much that it supported riparian trees along its banks, and it was causing erosion in Mattie Canyon. Furthermore, the dams in Cienega Creek next to the fields had changed the nature of that stretch of the stream, turning it into a series of relatively stagnant ponds.

Subsequently, a few years ago your office obtained an Arizona Water Protection Fund grant (#96-0020) of \$210,700 from the state for the purpose of reestablishing the natural flow of Cienega Creek in this area. This money was used to block the mouth of the diversion canal and remove the three dams that had been constructed in Cienega Creek. The idea was to try and restore normal hydrological function.

Last weekend I visited this area to see what changes had occurred since the restoration project had been completed. I found that there was no longer any surface flow in the diversion canal. But almost all of the riparian trees along its course were still thriving. The abandoned agricultural fields, which used to have a lot of bare ground, were almost completely covered with vegetation, including some grass and mesquite trees. The adjoining stretch of Cienega Creek, where the dams were, had thicker riparian vegetation, but the streambed was dry. I don't claim to know what all of this means but it was obvious that the restoration effort has made a difference.

The draft RMP and EIS describe the history of this stretch of Cienega Creek and mention the restoration project. But it seems to me that the EIS should pay more attention to the ecological restoration of this area.

I suspect that the historical channel of Cienega Creek wasn't located where it is now, in a relatively straight line up against a bank along the western edge of the abandoned agricultural fields. I think it probably meandered somewhat across the middle of the old fields. The recently accelerated re-vegetation of the old fields suggests that there's now more underground moisture there. Also, the continued health of the riparian

4 - 1 |

4 - 1. We plan to continue ecological restoration efforts in the old agricultural fields. One proposal calls for routing watershed drainages across the diversion canals. This would increase the soil moisture and change the expression of the plant community. The wetland at the southern end of this area is also in need of restoration. It was diked with levees, before BLM acquisition, to raise water levels for agricultural pumping. A proposal for this continued restoration has been added as a watershed management action common to Alternatives 2, 3, and 4.

Chapter 6: Public Comments and Responses

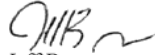
Letter 4, Page 2

4 - 2 |

trees along the old canal suggests there's still significant underground moisture there too. When you add it all up, it implies that the entire area, from the diversion canal and across the old fields to the existing creek channel, was once a moist, swampy area bisected by a sinuous stream channel. Just upstream, or south, of the old fields there's a swampy area that's separated from the fields by a low dike. Perhaps it would be a good idea to totally remove this dike so that this section of Cienega Creek can be freed to find its own natural equilibrium?

Thank you for this opportunity to participate, and please keep me updated on the status of this project.


Sincerely,



Jeff Burgess  
Ph 602-417-4486 (day)  
E-mail: [jburgess@grazingactivist.org](mailto:jburgess@grazingactivist.org)

4 - 2. See response 4-1.

Chapter 6: Public Comments and Responses

 **United States Department of the Interior**  
**BUREAU OF LAND MANAGEMENT**  
Tucson Field Office  
12661 East Broadway  
Tucson, AZ 85748-7208  
(520) 258-7200

In reply refer to:  
AZ060(8100)

August 27, 2001

**S.H.P.O. - 2001 - 2846 (7763) -**

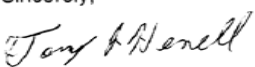
Mr. James Garrison  
Arizona State Historic Preservation Officer  
1300 W. Washington  
Phoenix, Arizona 85007

Dear Mr. Garrison:

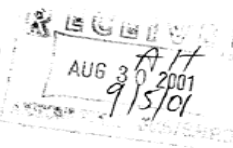
Enclosed, for your review and comment, is a draft copy of Las Cienegas Resource Management Plan and Environmental Impact Statement. As you may recall, the U.S. Congress recently established Las Cienegas National Conservation Area (NCA), which includes the formerly identified Empire-Cienega Resource Conservation Area.

Cultural resources in the Las Cienegas NCA include both prehistoric and historic properties. The Native American tribes and groups included for consultations concerning this plan are listed on pages 3-47 and A5-5. We are continuing efforts to stabilize and preserve the historic buildings at the Empire Ranch Headquarters. Plans for the next phase of work are being mailed to you under separate cover.

If you have comments about the draft plan, please have them sent to Max Witkind, Tucson Field Archaeologist, at 12661 East Broadway Boulevard, Tucson, Arizona, 85748.

Sincerely,  
  
Tony Herrell  
Acting Field Manager

*5 - 1* | *We prefer Alternative 2 with regard to archaeological and historical resources.*  
*Thank you.*  
*Carol Howard 9/28/01*  
*for SHPO*



5 - 1. Thank you for your comment.

Chapter 6: Public Comments and Responses

Letter 6, page 1

October 2, 2001

David McInay, Acting Field Manager  
Bureau of Land Management  
Tucson Field Office  
12661 E. Broadway  
Tucson, AZ 85748

Re: DRAFT Las Cienegas Resource Management Plan and Environmental Impact Statement

Dear Mr. McInay:

6 - 1 | I must compliment the BLM and the SVPP for all the effort put into the DRAFT Las Cienegas Resource Management Plan and Environmental Impact Statement. Your vision and goals for future conditions is good. While I believe Alternative 4 would best protect and improve flora, fauna and T & E species; I realize Alternative 2 is closer to what politics, budget and compromise will allow. Also, the BLM came into this process determined that grazing would remain part of the planning for this area. Alternative 4 is definitely the best for Willow Flycatcher, Lesser Long Nosed Bat and other T & E species. I can reluctantly support Alternative 2 (your Preferred Alternative) with some modifications as follows:

6 - 2 |

6 - 3 |

- All cattle and vehicle riparian crossings should be hardened to minimize sedimentation, which is a negative impact to the T & E fish species.
- I am opposed to a group camping site at the Ag Fields. I'm sure the fact the Ag Fields are already heavily impacted influenced this decision. However, they are situated next to an important riparian stretch, which would have negative impacts to wildlife if lots of campers are allowed next to it. Possibly an individual campsite at each end would not be a major impact. The Ag Fields should be considered for restoration to marshy conditions like they probably were before they were drained. There also is an important pre-Columbian cultural site at the NE corner of the Ag Fields. Having a group camping site near it could result in increased vandalism.

6 - 4 |

6 - 5 |

- I am also opposed to the new Empire allotment. From a taxpayer standpoint, it would cost far more to manage than the \$300/year the BLM would collect. It probably is being requested as a property tax dodge by the private landowners. It would be a double hit to the general public if new costs to the taxpayer would be used to avoid taxes by a few.

RECEIVED  
OCT 04  
TUCSON FIELD OFFICE

- 6 - 1. Thank you for your comment.
- 6 - 2. Thank you for your comment.
- 6 - 3. See response 2-5. The Bureau is currently proposing to harden two or three crossings with gravel and rock. One would be located on Empire Gulch, downstream and below the livestock enclosure; one at the Old Cienega Creek Road crossing on EC-901, the route from the Empire Ranch headquarters to the Cienega Ranch (for livestock, equestrian, and hiking use); and a third on Cienega Creek west of the agricultural fields (for resource concerns with the Cienega Creek restoration project). This is mitigation for soil disturbance and subsequent erosion. In some cases this will also prevent the mortality of livestock which can occur due to entrapment in deep mud.
- 6 - 4. See response 4-1. Ecological restoration of the old Agricultural Fields has been added to the Proposed Action - Alternative 2 Watershed Management Actions section. The maximum group size capacity for the old Agricultural Fields has also been reconsidered and reduced to 500 for a single event. In order to use the group site, participants would need to apply for a special recreation permit which would be evaluated through NEPA and if approved would include stipulations on the activity to protect ecological restoration efforts in the area. The group site is specified for low impact activity use. Use would be directed to the north east portion of the field. There is a proposal to provide water sources

*Chapter 6: Public Comments and Responses*

Letter 6, page 1 (continued)

- 6 - 4. (Continued)  
on the NCA as an alternative to visitors obtaining water from Cienega Creek. This would help prevent the trampling of stream vegetation and banks. The BLM will be monitoring impacts of uses of the old Agricultural fields area and implementing mitigation measures including, if necessary, the option to close the area to support restoration efforts.

Cultural resources in the conservation area are protected by the Archaeological Resources Protection Act (ARPA). People who choose to break this law, and who are caught disturbing, vandalizing, artifact collecting or looting cultural sites in the conservation area, may be fined up to \$100,000 and sentenced to as long as five years in prison. Information explaining the laws will be provided to visitors in brochures and posted on kiosks. Cultural properties near high-use areas, such as camping sites, will be systematically monitored.

Chapter 6: Public Comments and Responses


Letter 6, Page 2

6 - 6 |

- Consider retiring the Empire-Cienega allotment if the Donaldson's ever decide to quit leasing it. The likelihood of getting another lessee as conscientious and concerned about maintaining and improving the resource for flora and fauna is slim to none.

Thanks for your consideration of the above comments.

Sincerely,



Jim Notestine

P. O. Box 461  
Sonoita, AZ 85637

[irisjim@dakotacom.net](mailto:irisjim@dakotacom.net)

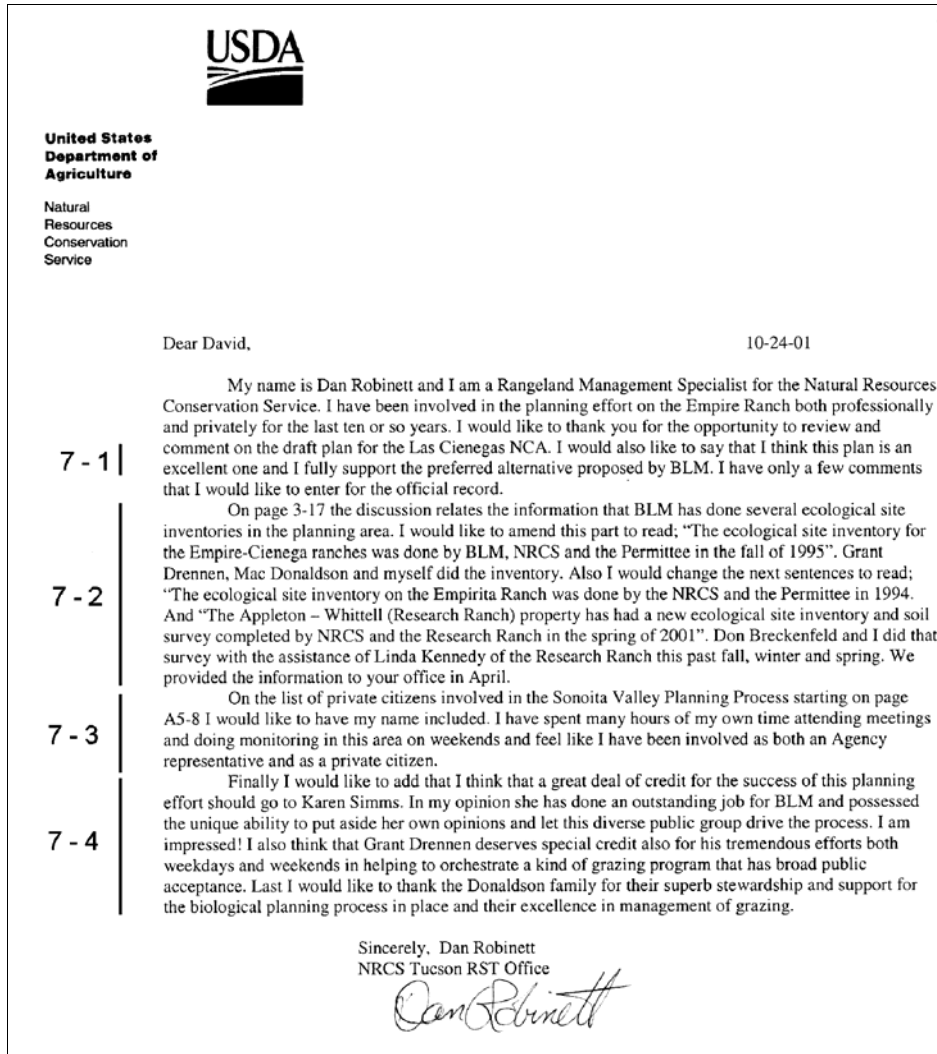
6 - 5. See responses 2-9 and 2-10.

6 - 6. This could be considered as an alternative if the Donaldsons were to terminate the grazing lease. Any new lessee would be required to meet the same level of coordination, consultation, and resource protection in conducting their operation.



Chapter 6: Public Comments and Responses

Letter 7



- 7 - 1. Thank you for your comment.
- 7 - 2. Your comment has been noted and the text has been modified in Chapter 3 Upland Vegetation section covering "Ecological Site Inventories of the Upland Vegetation".
- 7 - 3. Your comment has been noted and the text has been modified to include your name under Appendix 5; Private Citizen.
- 7 - 4. Thank you for your comment.

Chapter 6: Public Comments and Responses

Letter 8

RECEIVED  
NOV 13 2001  
TUCSON FIELD OFFICE

The Vera Earl Ranch  
P.O. Box 227  
Sonoita, AZ 85637

November 7, 2001

Bureau of Land Management  
Tucson Field Office  
12661 East Broadway  
Tucson, AZ 85748-7208

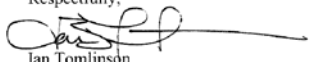
**Subject: Las Cienegas Plan Comment**

Dear Sir or Madam:

As you know, The Vera Earl Ranch has an allotment within the Las Cienegas boundary. Our allotment is small in comparison to the others, however, it is very important to our cattle operation as well as the proper conservation of the resources throughout the ranch. We have held the allotment for several years and managed the grazing according to the available resources. To my knowledge, we have never abused the ground and resources.

Under the preferred Alternative, Alternative 2, you propose to make 200 acres or fourteen percent of the allotment "non-grazing" land. We understand the reason behind having some land denoted "non-grazing" land and believe there is a need to allocate some land for resource evaluation. This land should exclude grazing. However, 200 acres out of our allotment would severely hamper our use of the allotment. We have the 1440 acres broken into three pastures of near equal size. If 200 acres are taken out of grazing use, it would effectively close one of our pastures.

The ranch believes that some of the allotment should be "non-grazing" and used for resource evaluation and vegetation study areas. However, we believe the evaluation and study can be done in an area much smaller than the proposed 200 acres. We would be much more amenable to sectioning off smaller sections in each of the pastures to conduct the study.

Respectfully,  
  
Jan Tomlinson  
Ranch Manager

cc: Cinnie Tomlinson, Bob Sharp

8 - 1

8 - 1. We understand your concern about the apparently large percentage of land proposed for grazing enclosures on the small parcel that you lease from the BLM. The idea in the Preferred Alternative was to stress the concept that under this alternative there would be a much more intensive monitoring of the resource being grazed. Areas that are being grazed would have additional adjacent lands set aside without grazing so comparisons could be made to determine the effects of livestock management. Currently the Vera Earl is not managed under the Biological Planning concept as defined in the Land Use Plan. Should you decide to implement that intensive management concept, the Bureau would work with you to determine appropriate lands to rest from grazing to adequately evaluate management. The 200 proposed acres in the plan are flexible, and are shown to demonstrate the commitment to the intensive management and monitoring involved. Text has been added to the proposed action (Alternative 2 Livestock Management) to clarify that the total acres excluded from grazing for study purposes are flexible and that size location and configuration of enclosures will be determined based on monitoring study design.

Chapter 6: Public Comments and Responses

Letter 9, Page 1

Macfarland Donaldson  
P.O. Box 57  
Sonoita, Arizona  
85637

Acting Field Director  
Bureau of Land Management  
12661 E. Broadway Blvd.  
Tucson, Arizona 85748

Received  
NOV 14 2001  
Tucson Field Office

11/10/2001

Sirs:

I would like to comment upon the Draft Las Cienegas Resource Management Plan and Environmental Impact Statement, which were presented in August of 2001.

9 - 1 On page 2-4 Goals for the Sonoita Valley, paragraph 9 should read, "promote stewardship of the resources" only. Also I would like to see a paragraph 11 that would read "to comply with and follow the guidelines of the National Conservation Act of 2000 see appendix 1.

9 - 2 On page 2-75 in the paragraph headed Empire Cienega allotment (#6090) the lease now states that it expires 12/31/2007.

9 - 3 On page 2-101 paragraph 4, I feel that to mandate that the allotments, other than the Empire/Cienega, implement a biological process is wrong. Those allotmentees should voluntarily enter into a biological planning process; and if their specific management achieves all desired resource goals they should not be forced to change their management philosophies.

9 - 4 On page 2-105 paragraphs 6 should be deleted, as there is already 2000+ acres of enclosures upon the Empire/Cienega. Also paragraph 4 should read 50 to 60%. And paragraph 5 should be deleted as it has already been implemented.

9 - 5

9 - 6

9 - 7

9 - 8 On page 2-106 paragraph 6b should be changed to 45 days. And paragraph 6d should read once annually. And paragraph 6f a responsibility of the Bureau should be added.

9 - 9

9 - 10

9 - 11 On page 2-107 paragraph 7c is extremely prohibitive as 5 miles from the creek, or the flycatchers habitat, would be the entire grazing allotment; and seeing that potential flycatcher habitat has been moved to actual habitat this year with the current management in place, I feel that this paragraph should be deleted. This point is also stated on page A2-40 paragraph 4 and page A2-42 paragraph 3.

9 - 1. Your comment has been noted. The goals and objectives of this plan were the consensus of the collaborative planning process and it is not suitable to modify them at this time.

9 - 2. Adherence to the guidance of the Las Cienegas National Conservation Act is an overarching requirement for this plan and BLM's management of the area. The goals and objectives are designed to fit under this guidance. Text has been inserted in Chapter 2 just before the goals and objectives describing the Las Cienegas Act and its guidance for the planning effort. Also see response 9-1.

9 - 3. Your comment has been noted and the text has been modified to show the correct date.

9 - 4. The other grazing leases would not be mandated to accept the concept of the Biological Planning Process.. However, if the lessees do not choose to embrace the process, the allotments would probably be managed under a conservative grazing management strategy similar to Alternative 3. The stocking rates would be set lower (more conservatively) and pasture rotations would be more established as necessary to achieve the resource objectives. An Allotment Management Plan (AMP) would be required by the Bureau, developed with full public and agency input with Terms and Conditions mandated in the Grazing Lease. As stated in the Land Use Plan under Alternative 2, an Ecological Site Inventory would be required to evaluate the Health of the Resource,

## Chapter 6: Public Comments and Responses

### Letter 9, Page 1 (continued)

9 - 4. (continued)  
and if the current management being practiced by the lessee is adequate, it could be documented by development of a written AMP. The AMP would be reviewed by the appropriate agencies and the public, including the Biological Planning Team (or Rangeland Resource Team). The AMP would need to be approved by the BLM Field Manager.

9 - 5. See response 8-1 and 9-4.

The exact number of acres included in study exclosures is not as important as having adequate acreage that is excluded from grazing placed in study exclosures adjacent to the grazed lands. The parameters of the study exclosures (size, location, and configuration) need to be planned to ensure that meaningful comparisons and evaluations can be made on the impacts of livestock grazing on the public lands. As you are aware, the plan and the monitoring must be flexible to be able to continually adapt to changing needs and new issues.

9 - 6. The utilization limit of 30% to 40% (light to moderate) for livestock in Alternative 2 is a key conservation feature of the grazing plans for Las Cienegas National Conservation Area. An upper utilization limit of 40% ensures that important watershed, fisheries, and wildlife values will be conserved and maintained as per the enabling legislation. It is highly unlikely that the desired plant community objective, desired ground cover objective; the upland wildlife habitat sub-objectives; and riparian vegetation objectives could be achieved with an upper utilization limit of 60%. It is likely that grazing effects to wildlife species and habitats would be substantially different with a 60% utilization limit and wildlife objectives might not be met. For example, with a 60% upper utilization limit, livestock would probably reduce native grass canopy cover and reduce cover below that which is required for successful fawning by pronghorn and white-tailed deer. It is likely that residual cover for over-wintering Baird's sparrow and nesting Grasshopper sparrows would not be sufficient at a 60% utilization level on most public lands within the conservation area.

Utilization is, however, only one tool to be used to help prevent damage to the forage plants. It is intended to be used with the other monitoring practices through the Biological Planning Process to help us evaluate where management can be improved by better movement of livestock. Monitoring may show that some areas are over-used, while some lands may be receiving very little use. We hope to use monitoring results to identify opportunities to improve management, and not as the sole measure for determining stocking rates, as has been common in some plans..

9 -7. We recognize that additional exclosures have recently been constructed, through implementation of your watershed protection grant, and that this acreage may not be included in the figure presented in the plan because this document was written prior to completion of exclosure fencing. It is important to note that existing exclosures may not be the correct size, configuration or location for study exclosures and may need to be modified to function as study exclosures. Also see response 9-5 above.

*Chapter 6: Public Comments and Responses*

Letter 9, Page 1 (continued)

- 9 - 8. The text is correct as written. Twenty-one days was previously identified as the maximum length of time that livestock would need to use the crossing lanes each year (although actual use may be much less and may not occur every year). In discussions with you since submission of your written comments, it was agreed that should additional time be needed to use the lanes, the Bureau would work with you and the Fish and Wildlife Service through the Section 7 Consultation Process to address the appropriate time limits and required mitigation. We also agreed that the use of lanes should be addressed at the Biological Planning meetings prior to their use to discuss impacts and concerns.
- 9 - 9. We concur that annual maintenance of these fences will be sufficient if it is just prior to use of lands adjacent to the exclosures. The text has been modified to make this change.
- 9 -10. Yes, the Bureau should be responsible for any necessary pumping of repressos not related to the livestock operation. Text has been added to clarify this action.
- 9 -11. This is a requirement in the U. S. Fish and Wildlife Service's current biological opinion on the interim grazing plan and so was incorporated into the proposed action for the RMP. Development of alternative upland waters to replace riparian watering areas and fencing to exclude cattle from the creek are considered crucial to protecting riparian habitat and are provided for in the current biological opinion.

Chapter 6: Public Comments and Responses

Letter 9, Page 2

9 -12 | In the Appendices Chapter 6 (ACEC's) I have some concerns with the No. 6 Objectives; I would like to see livestock grazing removed from the sentence, as there are more than adequate controls already in place. In the No. 6 Management Prescriptions, I hope that this does not include fencing as that is our best tool for managing livestock in the riparian zone (100 year flood plain). Philosophically I would like to state that I support ACEC alternative #3, and do not support alternatives # 2&4.

9 -13 | Following is my comments on the various tables:  
9 -14 | Table 2-25 on page 2-106 the crossing lane EC 900 will be at the old road crossing south of that site as per J. Simms' prescription. Sam's crossing is no longer to be considered. Currently the section 7 consultation with the U.S. Fish and Wildlife Service allows for winter use from Dominquez to the Narrows and that should not change.

9 -15 | Table 1 on page A2-50 should read as the amended Table 2-25.  
9 -16 | Table 2 should no longer read proposed fencing as all but the "Narrows Riparian Fence" has been completed.

9 -17 | I have attached 2 maps that have been corrected (Maps 2-13 & 2-22).

9 -18 | In Closing I strongly support the overall Alternative 2 that is outlined on page 2-105 as I was instrumental in its' formation and my livelihood is directly impacted by the grazing management of the Empire/Cienega Allotment. I thank you for your considerations on the above comments and await your response.



Mac Donaldson

9 -12. The objectives and management prescriptions for the proposed ACECs cover both existing management and future proposals. So the livestock management changes you have made including the fencing of riparian areas support the ACEC proposals and are consistent with the ACEC objectives and proposed actions.

9 -13. Your comment has been noted.

9 -14. Table 2-25 has been corrected.

9 -15. Table A2-50 is included as part of the summary of the Interim Grazing Plan in the appendix as a reference on current management. Therefore it has not been changed.

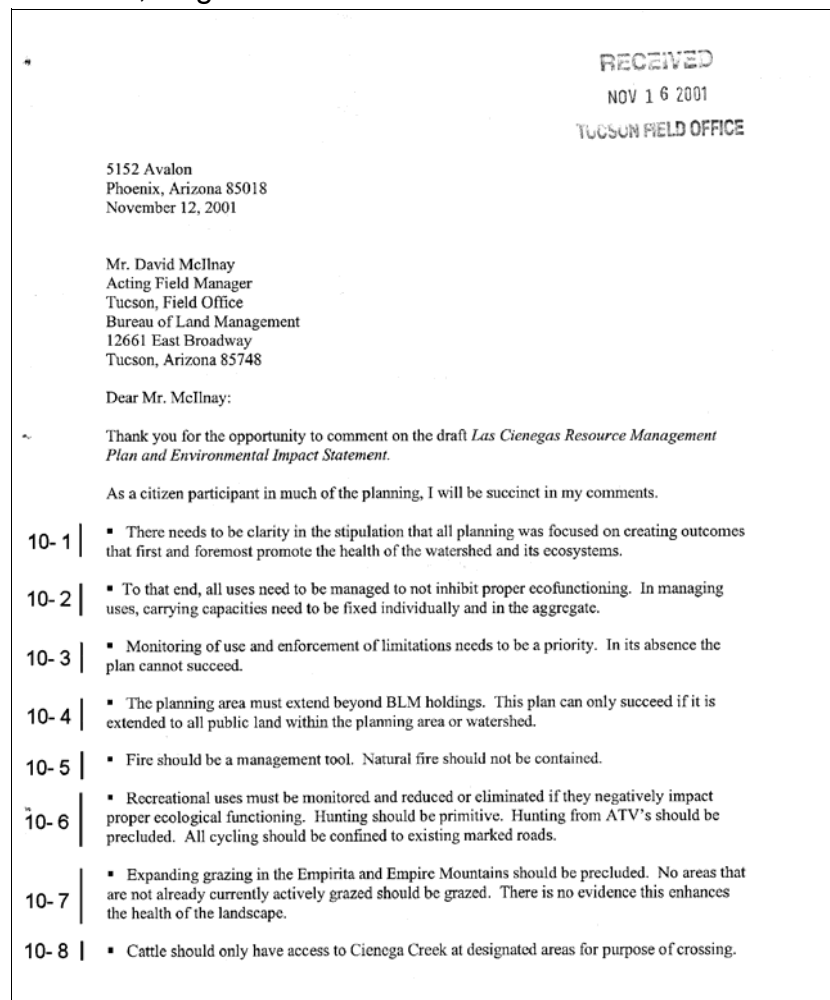
9 -16. See response 9-15.

9 -17. Corrections have been made to Maps 2-13 and 2-22.

9 -18. Thank You for your comment.

Chapter 6: Public Comments and Responses

Letter 10, Page 1



- 10- 1. You are right that the SVPP planning process was focused on, first and foremost, promoting the health of the watershed and its ecosystems as the foundation on which all the uses are dependent. The goals and objectives are the basis by which this health is described and measured, while the monitoring is, and will be, designed and evaluated to ensure that proposed actions achieve these objectives.
- 10- 2. Carrying capacity cannot be fixed in most cases, as the conditions that affect carrying capacity are not well understood, and processes by which it is affected often fluctuate annually and seasonally. This is why objectives that set a definition of ecosystem integrity were formulated. Carrying capacity will have to follow, as these thresholds are approached by various uses. This is what is commonly called “adaptive management,”
- 10- 3. An ecosystem monitoring program is being developed and will be published as a supporting document to the RMP/EIS.
- 10- 4. We agree that the health of public lands depends on the conditions of the entire basin and in some cases beyond these boundaries. The planning area’s public lands are not sufficient to protect, conserve and enhance all the resources under BLM’s jurisdiction. Outreach and cooperation will be ongoing in the basin in the pursuit of compatible uses and management of adjacent lands that cannot be acquired or protected through easements.

## *Chapter 6: Public Comments and Responses*

### Letter 10, Page 1 (continued)

- 10- 5. The use of prescribed fire has been identified under vegetation treatments as a watershed management action common to Alternatives 2, 3, and 4. The text has been modified in this section to make this concept more clear. It is really not feasible, with the current land ownership patterns and under existing policies, to manage naturally ignited fires as prescribed fires. BLM's current fire policy is that a fire must be put out unless it occurs within a burn unit and is in prescription. Natural fire is widely recognized as an important element in desert grassland systems. Many investigators suggest that suppression of wildfire and intensive grazing are the two major factors responsible for the decrease in native grass cover and the increase in mesquite and shrub cover. However due to the increasing level of human occupation and recreation in the Sonoita Valley it will not be feasible to allow all natural fires to burn in an un-contained fashion. In addition BLM will be required, under all alternatives, to design vegetation treatments limiting agave mortality to 20%. This limitation will be imposed to conserve the nectar resource for lesser long-nosed bats (for example see item 2d on page 2-67, and item 4 on page 2-88, of draft plan). The plan allows for prescribed fire to meet certain objectives. Refer to Appendix 2, page A2-52, for a description of how these prescribed fires will be planned and conducted.
- 10- 6. Monitoring of recreation impacts will be integrated into the Ecological Monitoring Program. Additional details have been added to the monitoring section of Chapter 2. ( See response 10-3 also).
- 10- 7. See responses 2-9 and 2-10.
- 10- 8. Under the Preferred Alternative the objective is to remove cattle from all of the perennial portions of Cienega Creek to the greatest extent possible. The only areas remaining would be those where livestock movement patterns require that they cross the creek, and in those areas where BLM and the operator have not yet figured out how to create an alternative water to the creek, as is the situation at the north end of the Empire-Cienega south of the narrows where limestone geology has so far prevented the development of an alternate water source. (See response 2-5).



Chapter 6: Public Comments and Responses

Letter 10, Page 2

November 12, 2001  
Page Two

- 10-9 | ■ It is critical that both the dollars and human resources necessary to implement and manage the plan be committed at the time of adoption. In the absence of resources that plan is a hollow shell.
- 10-10 | ■ I object to the language on Page 2-4, Paragraphs 8 and 9. It implies that use is obligatory and responsive to human demand, not ecological health. That is contrary to what underlined this planning effort. Use was a privilege to be managed in deference to ecological functioning. This assures the potential for future use with retained value.
- 10-11 | ■ The concept of the Biological Planning Team should be extended to all uses not just grazing.

Thank you for your consideration.

Sincerely,

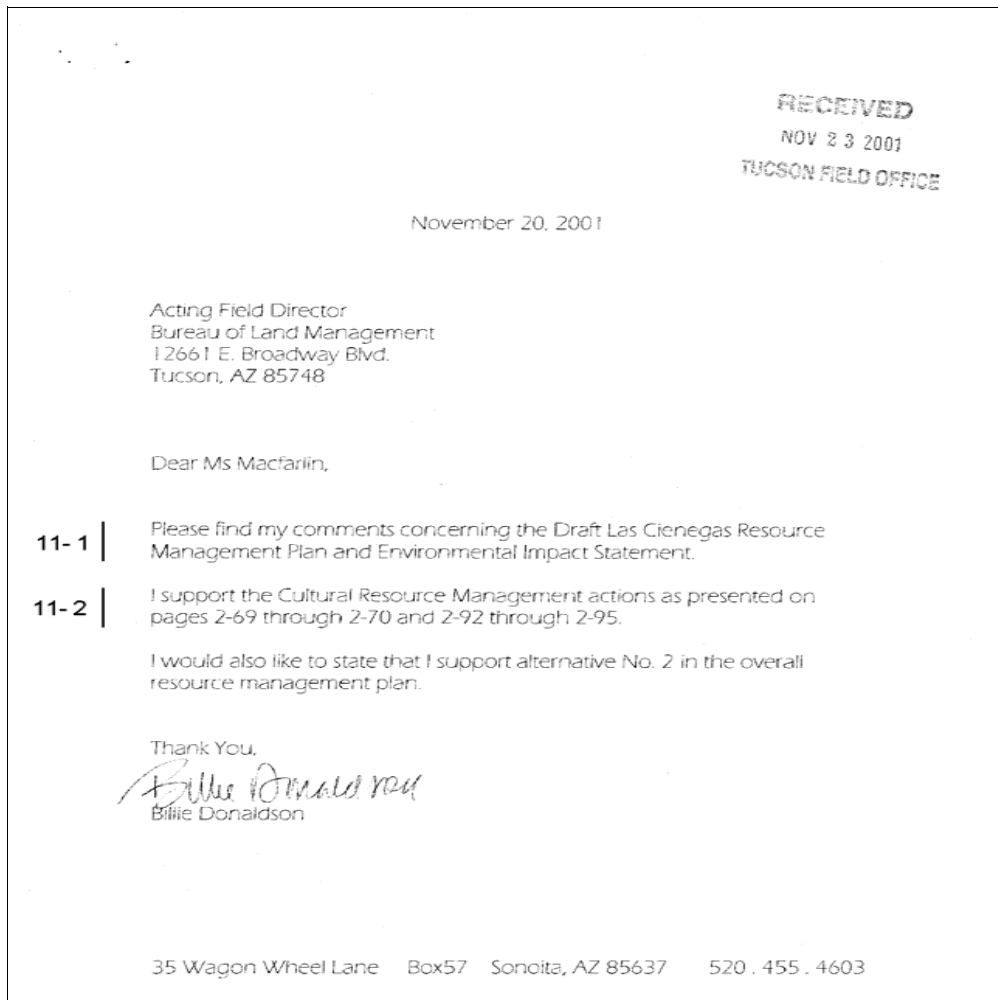


Jeff Williamson  
(602) 914-4325  
jwilliamson@thepxzoo.com

- 10-9. Your comment has been noted. During recent meetings of the Sonoita Valley Planning Partnership, the formation of some type of Las Cienegas support organization which might function to generate additional revenues, such as grants, for the area has been discussed and is being pursued.
- 10-10. Your comment has been noted. See response 9-1.
- 10-11. It is the intent to expand the Biological Planning Team to other resource uses. The Bureau may request that the Arizona Rangeland Advisory Council create a separate Rangeland Resources Team under the Grazing regulations. This group could be expanded to address factors, other than grazing, that are having an effect on Rangeland Health.

Chapter 6: Public Comments and Responses

Letter 11




11- 1. Thank You for your comment.

11- 2. Thank You for your comment.

Chapter 6: Public Comments and Responses

Letter 12, Page 1



**SKY ISLAND ALLIANCE** RECEIVED  
P.O. BOX 41165 TUCSON, AZ 85717-1165 NOV 23 2001  
738 N. 5TH AVENUE, SUITE 201, TUCSON AZ 85701  
(520) 624-7080 info@skyislandalliance.org TUCSON FIELD OFFICE  
www.skyislandalliance.org

11/21/01

David McInay  
Acting Field Manager  
Tucson Field Office  
12661 E. Broadway  
Tucson, AZ 85748

Dear Mr. McInay,

Please accept the following comments for inclusion into the decision making process regarding the final RMP/EIS for the Las Cienegas National Conservation Area.

The Sky Island Alliance is a 501 (c3) member-based organization dedicated to the preservation and restoration of native flora and fauna within the Sky Island region. We represent over 600 members within southeast Arizona, southwest New Mexico, and around the country.

12- 1 | Considering the special biological resources contained within LCNCA and the emphasis on ecosystem planning, we feel that Alternative 4 will best meet the biological and social needs of the area. The transportation system in particular is best addressed in Alternative 4.

Roads have far reaching effects upon the integrity of watersheds, flora, fauna, and soils on any given landscape. Direct effects of roads include roadkill, road aversion, population fragmentation/isolation, pollution, habitat loss, exotic plant invasion, edge effects, and the many aquatic impacts such as sedimentation, runoff, earth slides, flow alteration, and riparian vegetation degradation. Indirectly, roads are associated with almost all forms of wildlife harassment and habitat destruction. Development, domestic animals, increased human harassment, poaching, and noise are associated with roads – activities that native species are negatively affected by or tend to avoid. Also, road densities can lower the habitat effectiveness for many large mammals (Lyon 1983, Thiel 1985, Forman & Alexander 1998, Mech, Fritts, Radde, and Paul 1988, Brody and Pelton 1989). A good example of wildlife aversion to roads is a study done in Arizona and Utah that found cougars avoided

12- 1. Your comment has been noted.

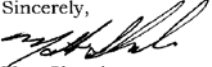
Chapter 6: Public Comments and Responses

Letter 12, Page 2

12- 2 | roads whenever possible and established home ranges in areas with the lowest road densities (Van Dyke et. al, 1986). As inferred, landscapes that are 'roadless' or contain very small road densities are almost always more biologically sound than heavily roaded areas. Today in the United States, most roadless lands or lightly roaded areas are confined to high elevation, rugged terrain because of the inability or difficulty in building roads there. Because of the ecological advantages that roadless areas provide, there is a large disproportion of healthy habitats in these mountainous areas. Lightly roaded areas within lower elevation habitats are very important to species that either live or travel through these places. The LCNCA contains a relatively high density of roads. Past ORV use, user-created roads, and poor road planning have resulted in over 135 miles of roads within the BLM portions of the LCNCA. This correlates to a road density over 1.8 miles of road per square mile – a high number indeed. In comparison, the Coronado National Forest, under no special designations, limits road densities to 1.0 mi/mi<sup>2</sup>.

12- 3 | The road network in any given area is important to take into account when assessing the health and effectiveness of different habitats, including wildlife corridors. Also, the impact of roads can be relatively easily mitigated, through sound planning, local input, and restoration principles, such as those being carried out through this planning process. On any given landscape, there are often roads that are no longer needed, used very little, or do not serve any definable purpose, offering good opportunities for improving the health of the landscape with minimal conflict of interests. With the designation of this area as a National Conservation Area, we must realize that past uses of the transportation system may not, in specific cases, be compatible with the needed management of the area. We recommend that roads that have been user-created, cross riparian areas, do not serve definite purposes, or are in areas of high road density be closed. Alternative 4 best represents these recommendations.

Thank you for this opportunity to comment on the LCNCA management plan. We look forward to seeing a sound final EIS that strives to protect and preserve the rich biological resources that it holds.

Sincerely,  
  
Matt Skroch  
Field Director

- 12- 2. The road network was discussed in great detail at the SVPP meetings. Many of your concerns were addressed in the OHV route designation alternatives.
- 12- 3. Your comment has been noted. An effort has been made under Alternatives 2, 3, and 4 to minimize roads crossing riparian areas, and to propose closing redundant or unauthorized roads.

References

Brody, A.J. and M.P. Pelton. 1989. Effects of roads on black bear movements in western North Carolina. *Wildl. Soc. Bull.* 17:5-10.

Thiel, R.P. 1985. Relationship between road densities and wolf habitat suitability in Wisconsin. *Am. Midl. Nat.* 113:404-407.

Forman R.T.T. and L.E. Alexander. 1998. Roads and their major ecological effects. *Annu. Rev. Ecol. Syst.* 29:207-231.

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Sweaner, L.L., K.A. Logan, and M.G.Hornocker. 2000. Cougar dispersal patterns, metapopulation dynamics, and conservation. *Conservation Biology* 3:798-808.

Mech, L.D., S.H. Fritts, G.L. Radde, and W.J. Paul. 1988. Wolf distribution and road density in Minnesota. *Wildl. Soc. Bull.* 16:85-87.

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Chapter 6: Public Comments and Responses

Letter 13

October 30, 2001

Bureau of Land Management  
Acting Field Manager, Tucson Field Office  
12661 E. Broadway  
Tucson, AZ 85748

RECEIVED  
NOV 23  
TUCSON FIELD

Dear Mr. McInay,


13- 1 I have reviewed the *Draft Las Cienegas Resource Management Plan and Environmental Impact Statement* and do NOT concur with your recommended alternative (alt. 2). I feel alternative 1 is the best alternative presented. My family and I live in the local area of the NCA and enjoy visiting there in my OHVs (Jeeps). We enjoy "taking in the view" while driving the existing trail network, picnicking, and hiking.

13- 2 Alternative 3 is the best "action" alternative presented. My main objection to this alternative is that the motorized trail along the Cienega Creek is severed at the north end of the BLM land. There is approximately 1/2 mile where the trail designation is changed from "Open" to "Closed" for motorized travel. This cuts a very popular, scenic route from Hwy 83 to Interstate 10.

13- 3 Your Draft EIS repeatedly refers to an expected increase in recreational use of this area while your recommended alternative would severely limit recreational access and OHV trails. Limited recreation areas cause overcrowding and may lead to things neither of us wants to see, things like severe damage to the limited access areas and the "wildcat roads" your report mentions.

13- 4 Your recommended alternative designates "all public lands within the planning area" as an area of critical environmental concern (ACEC). I do not see how all the public land fits the definition of ACEC. Where is the "national concern"? I understand the concerns along the creek, and this area may warrant an ACEC designation as in alternative 3, but not all public lands. The access restrictions that could arise from ACEC designation are unacceptable. It is my understanding the push for the all encompassing ACEC designation comes from local property owners who expect property values to increase with use restrictions. I challenge that the BLM's job is to manage this NCA for the enjoyment of all citizens, not just those lucky enough to own adjacent property.

13- 5 I would like to see this area continue as it is today: a beautiful open space with multi-use access. Most of the concerns brought up in the Draft EIS can be handled through enforcement of existing rules. What is the cost of a few additional rangers versus some of your other proposals? Restricting access punishes the many for the misdeeds of a few.

  
Martin Sindelar  
1296 Cottonwood Drive  
Sierra Vista, AZ 85635

- 13- 1. Your comment has been noted.
- 13- 2. The decision, to restore the Narrows area of Cienega Creek and not allow vehicular or mechanized stream crossings, was made to further protect sensitive vegetation communities which, as a result of successful management practices, have been returning to original marshy conditions. These riparian and aquatic communities also support important habitats for endangered Gila topminnow and candidate Gila chub, which can be harmed by vehicle travel through the area. Marshy conditions make the Narrows area of the creek difficult to cross on foot or horseback and impassable to vehicles most of the time. Vehicles attempting to cross the creek usually become mired down in the mud. Considerable damage is done to vegetation and stream banks and aquatic animals are probably harmed when vehicles are pulled out of the mud. In addition, use of the route by smugglers has increased in recent years and several times as many as five vehicles have had to be removed from the area at one time.

Proposals to provide northern access for Las Cienegas NCA are not included within the Preferred Alternative, which identifies the Highway 83 and 82 entrances for access. BLM manages only small scattered parcels of public lands in this northern area and most of the roads in the northern portion of the planning area are on State Trust Lands and not open for recreational use except for people hunting



## *Chapter 6: Public Comments and Responses*

### Letter 13 (continued)

- 13- 2. (continued)  
with a valid hunting license or those with a valid recreation permit issued by the Arizona State Land Department.
- 13- 3. This issue is addressed in the recreation analysis, page 4-106 of the Draft Plan. Yes, more environmental damage may occur when use is concentrated. Also anticipated are the potential actions of displaced visitors who cannot find available space to recreate (camp, park ) in zones 1 or 2 . Many visitors may move to Zone 3 (more than what occurs now). However, there are mitigating steps identified that may be applied to prevent damage to zones 2 and 3 if monitoring indicates use levels have exceeded capacity. A tiered approach will be taken to stop or reduce negative impacts. The steps taken could include increased law enforcement, designating camp sites, implementing a fee/permit system to regulate the number of visitors to various zones, and temporary or permanent closures to allow for rehabilitation of an area.
- 13- 4. ACEC designations highlight areas where special management attention is needed to protect important historic, cultural, and scenic values, fish or wildlife resources or other natural systems or processes; or to protect human life and safety from natural hazards. Under 43 CFR 1610.7-2, areas with potential for ACEC designation and in need of protective management must be identified and considered in the planning process. Nominations can be made by either the agency or the public and eligibility of lands nominated for ACEC designation must be considered in the land use plan. In order to be considered a potential ACEC and analyzed in the land use plan alternatives, an area must meet the criteria of relevance and importance, as established and defined in 43 CFR 1610.7-2. Generally, relevance is based on the presence of a significant resource, value, system, process, and/or hazard, and importance is based on whether the resource, value, system, process or hazard has substantial significance and values. The Las Cienegas NCA contains such resources and values of national concern as stated in Section 4 of the Act Establishing the Las Cienegas National Conservation Area.
- The proposed Las Cienegas RMP is the entire plan proposed for all public lands in the planning area including the ACEC and NCA. The RMP was designed to include both Land Use Plan allocations and designations as well as management actions so that there would not be numerous additional plans in the future with as yet undetermined management prescriptions. Therefore, all restrictions on uses on ACEC and NCA lands are described in this plan. A new section has been added to Chapter 2: Recreation Management Actions common to Alternatives 2, 3, and 4 which summarizes visitor use restrictions and allowable uses.
- 13- 5. The participants in the SVPP also shared the desire for the public lands in the planning area to remain much as they are now with healthy resources, open spaces, and a variety of multiple uses. The Las Cienegas NCA Act recognizes these desires by not only prescribing conservation, protection and enhancement of the variety of nationally significant and unique resources of the NCA but also prescribing the continuation of dispersed recreation and grazing in appropriate areas. However, in order to achieve prescriptions mandated in the Act and maintain current conditions, while at the same time adjusting to increasing visitation and demands on the resources, some restrictions on human uses are necessary. Enforcement will also be an integral part of the Proposed Action as will continued partnerships with a variety of users.

Chapter 6: Public Comments and Responses

Letter 14, Page 1

	<p>THE STATE OF ARIZONA <b>GAME AND FISH DEPARTMENT</b> 2221 WEST GREENWAY ROAD, PHOENIX, AZ 85023-4399 (602) 942-3000 • WWW.AZGFD.COM</p>	<p>GOVERNOR JANE DEE RÜLL COMMISSIONERS CHRISTIAN DENNIS D. MANNING ALPINE MICHAEL M. GOLISHTY FLAGSTAFF JOE CANTOR SAFFORD SUZAN E. CHISTON ARIZONA W. HANS GILSTRAP PHOENIX DIRECTOR DIANE L. SIBOLPPE DEPUTY DIRECTOR STEVE K. FERRELL</p> 
<p>November 23, 2001</p>		<p>RECEIVED NOV 26 2001 TUCSON FIELD OFFICE</p>
<p>Mr. David McNay Acting Field Manager Tucson Field Office Bureau of Land Management 12661 E. Broadway Blvd. Tucson, Arizona 85748</p>		
<p>Re: Draft Las Cienegas Resource Management Plan and Environmental Impact Statement</p>		
<p>Dear Mr. McNay:</p>		
<p>The Arizona Game and Fish Department (Department) has been a member of the Sonoita Valley Planning Partnership (SVPP) since its inception over six years ago. We have found our participation in this partnership to be a very positive and productive endeavor. The Department commends the Bureau of Land Management (BLM) on the implementation of a community-based ecosystem planning strategy. The conversation and debate generated as part of this strategy addressed and resolved many issues prior to the publication of the Draft Las Cienegas Resource Management Plan and Environmental Impact Statement (LC-RMP/EIS). The Department supports the Preferred Alternative provided the following issues are addressed and resolved prior to developing the Final LC-RMP/EIS.</p>		
<p><u>Transportation Network</u></p>		
14-1	<p>The LC-RMP/EIS does not adequately describe the proposed changes to the existing road network. The only information available is presented at a gross-level scale in the Land Use Plan Alternatives which we believe does not allow for necessary review to determine what specific changes are proposed for any given road segment. For example, the descriptions only discuss changes to the road system by total mileage (Page 2-17, Table 2-4). Associated maps (Maps 2-2, 2-6, 2-13, 2-18) identify those areas that will be affected by changes in the road network, but there is no presentation of the existing road network. It would be helpful if the maps presented the proposed changes overlaid on the existing road network as well as identification of place references. We also request that the Activity Plan Alternatives provide specific text descriptions for each proposed modification to a road segment.</p>	
14-2	<p>The Department also requests clarification on the location of the proposed connector road intended to connect two existing roads across Cienega Creek near Bootlegger Well. Map 2-6 appears to present conflicting information about this proposed new road segment.</p>	
14-3	<p>The Department also requests clarification on the location of the proposed connector road intended to connect two existing roads across Cienega Creek near Bootlegger Well. Map 2-6 appears to present conflicting information about this proposed new road segment.</p>	

- 14- 1. Your comment has been noted.
- 14- 2. The route designation maps have been redone at a finer scale and with a topographic background, which should make review of the road designations easier. Map 2-2 depicts the existing road network.
- 14- 3. Map 2-6 has been modified to better show the connector road which would be proposed mitigation if BLM acquires lands in this area and the road crossing Cienega Creek north of the Narrows is closed.



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Letter 14, Page 2

Mr. McInay  
November 23, 2001  
2

14- 4

The Department has not reviewed any data to support the proposed seasonal closure of the Road Canyon loop road during the antelope fawning season. The Department recommends maintaining this segment as open, year-round until such time as traffic becomes an issue adversely affecting fawn survival.

Livestock Grazing

14- 5

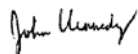
The current Biological Planning Team Process being implemented on the Empire-Cienega Allotment was created and is perpetuated by the lessee. Replicating the Biological Planning Team Process is an important element of Alternative 2; however, the Draft LC-RMP/EIS is unclear about who will be responsible for coordinating and conducting these Team meetings if this alternative is implemented. The Department recommends that BLM assume this role since the continuity and effectiveness of the Biological Planning Team is more likely to persist under the auspices of the BLM.

14- 6

The Department is uncomfortable with an open-ended stocking rate as proposed in Alternative 2. We do, however, strongly support the tiered approach to determining livestock numbers based on resource (primarily precipitation) condition. In fact, we would recommend that upper limits for livestock numbers be set for each resource condition. The numbers proposed in Tables 2-21, 2-22, and 2-23 appear to be an appropriate starting place. This modification to Alternative 2 still provides the flexibility of the Empire-Cienega model, while providing some measure of certainty for the maximum number of livestock that the resource condition should support. These maximum numbers can be adjusted at the 5-year interval plan evaluation periods.

Thank you for the opportunity to review the Draft LC-RMP/EIS. We look forward to working cooperatively with BLM during the development of the Final LC-RMP/EIS. Please contact Ms. Sherry Ruther, Regional Habitat Specialist, at (520) 628-5982 ext. 137 if you have questions or require additional information.

Sincerely,



John Kennedy  
Habitat Branch Chief

JFK:sr

cc: Gerry Perry, Regional Supervisor, Region V, Tucson  
Sherry Ruther, Regional Habitat Specialist, Region V, Tucson  
Bob Broscheid, Project Evaluation Program Supervisor, Habitat Branch, Phoenix

- 14- 4. The situation in the Las Cienegas Conservation Area differs from other recent pronghorn studies (for example Ockenfels et al., 1994). Within the planning area truly permanent water sources in suitable pronghorn habitat are very limited. Most earthen reservoirs are dry during the fawning season. Many supposedly permanent wells are active when cattle are present in that particular pasture and are turned off when livestock are gone. The windmill in Road Canyon is, at times, one of two or three available water sources within an 8000-acre block of available habitat. Based on field observation, this water is vital to pronghorn during fawning season. It is highly likely, under such circumstances, that human disturbance will significantly reduce pronghorn utilization of this source and, in turn, adversely affect fawn survival.

BLM welcomes and supports any and all efforts by the Department to assess the condition of the local pronghorn herd and develop additional recommendations to maintain and enhance grassland habitat for the species. Due to increased recreational use in the conservation area, continued conversion of pronghorn habitat into fenced, rural subdivisions, and the recent decline in pronghorn numbers, it is prudent to take necessary action to reduce human disturbance around this important water source. If additional investigation reveals that the closure is not necessary then the plan can be modified to remove this provision.

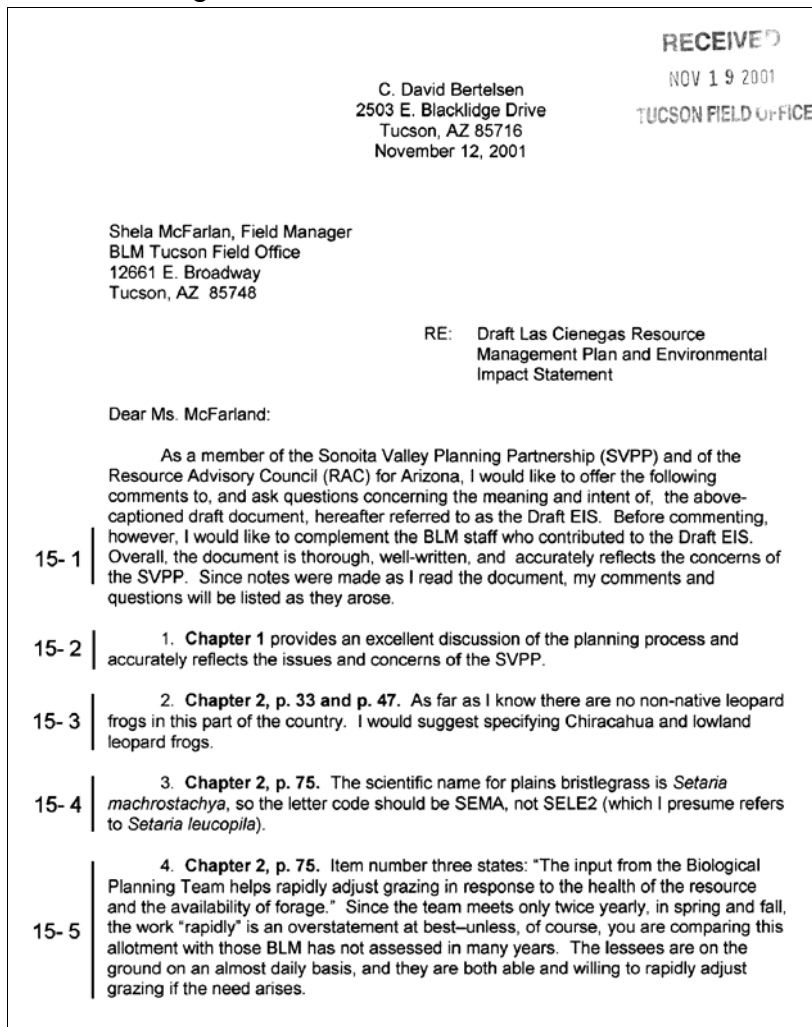
*Chapter 6: Public Comments and Responses*

**Letter 16, Page 2 (continued)**

- 14- 5. The BLM intends to continue the Biological Planning Process and pursue structuring the Biological Planning Team as a Rangeland Resource Team. Refer to response 2-1.
  
- 14- 6. See response 2-2.

Chapter 6: Public Comments and Responses

Letter 15, Page 1



- 15- 1. Thank you for your comment.
- 15- 2. Thank you for your comment.
- 15- 3. Your comment has been noted and the text has been modified.
- 15- 4. Your comment has been noted and the text has been modified.
- 15- 5. Thank you for your comment. The text has been modified.

Chapter 6: Public Comments and Responses

Letter 15, Page 2

15-6	5. <b>Chapter 2, p. 79 and p. 81.</b> If livestock grazing is permitted, natural resources should be monitored. Why are the Rose Tree and Vera Earl Allotments, which comprise over 5,000 acres of public land, not being monitored? Is the problem lack of concern for the health of these lands, lack of commitment to the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (hereafter referred to as the Standards and Guidelines), or lack of resources?
15-7	6. <b>Chapter 2, p. 95.</b> The first sentence of item number two under "Cultural Properties..." does not make sense.
15-8	7. <b>Chapter 2, p. 99.</b> The spacing of line three in the second column should be adjusted.
15-9	8. <b>Chapter 2, p. 99.</b> Item three in the same column mentions "mineral specimens, ..., petrified wood, invertebrate fossils, and semiprecious gemstones." If the last three items are, indeed, to be found in the area, I see no need to mention them in this document--this could encourage recreational rockhounds to visit the area in greater numbers.
15-10	9. <b>Chapter 2, p. 105.</b> Although I strongly agree that reducing utilization levels "to 30-40 % of current year's growth on key perennial grasses" is high desirable, this might very well be far too much in a drought period. Moreover, it is essential that utilization be measured in areas where livestock actually graze, including highly impacted areas, not areas distant from waters. Because of much higher utilization around waters, even a utilization level of 50% could be met only by averaging data from several monitoring sites if the highly impacted sites are monitored. As I see it, in Arizona, a major problem BLM has in measuring utilization is the tendency to average utilization results over a very large area and/or in areas grazed lightly or not at all.
15-11	10. <b>Chapter 2, p. 106 (item 6b) and p. 108 (item 7b).</b> Why are twenty-one days allowed to move cattle through crossing lanes? This permits, at least potentially, very high impact on the riparian corridor but encouraging the introduction of invasive species and causing increased erosion and siltation downstream.
15-12	11. <b>Chapter 2, p. 109.</b> The last sentence in the first paragraph needs the word "use."
15-13	12. <b>Chapter 2, p. 111, item 3.</b> Why should BLM "build any needed range improvements" in the proposed Empire Mountains Allotment? The <u>permittee</u> should be required to build all range improvements, including fencing.
15-14	13. <b>Chapter 2, p. 132.</b> The draft states, "Upland vegetation will be monitored at permanent vegetation transects on the Empire-Cienega and Empirita allotments." Does this mean that there will continue to be no systematic monitoring on the Rose Tree, Vera Earl, and (proposed) Empire Mountain allotments? These allotments include over 7,000

- 15- 6. They are not being monitored because the Bureau has lacked the resources, staff and funding to do so. Under our Bureau allotment categorization process, these two allotments were in good resource condition and current management was considered adequate to maintain the existing conditions. The Rose Tree allotment grazing lease was evaluated and the allotment was considered to be meeting Arizona Standards for Rangeland Health and the lease was renewed. The Vera Earl allotment grazing lease was evaluated and the allotment was considered to be meeting Arizona Standards for Rangeland Health. A decision was issued proposing renewal of the lease for an additional ten years. However, the grazing decision was protested by the Center for Biological Diversity. It is currently pending issuance of the final decision.
- 15- 7. Your comment has been noted and the text has been modified.
- 15- 8. Your comment has been noted and the text has been modified.
- 15- 9. Your comment has been noted and the text has been modified.
- 15-10. See responses 2-2 and 9-5.

*Chapter 6: Public Comments and Responses*

**Letter 15, Page 2 (continued)**

- 15-11. See responses 2-5 and 2-6 above. We are currently looking for additional ways to reduce impacts of crossing lanes, such as hardening the lanes with gravel and rock and developing alternative upland waters. However, we have still not resolved all the problems with moving the cattle from the east side of the creek to the west.
- 15-12. Your comment has been noted and the text has been modified.
- 15-13. See response 2-10 above.
- 15-14. Under all alternatives the Bureau proposes to complete Ecological Site Inventories on the public lands in the Vera Earl, Rose Tree, and Empire Mountains areas. As a part of this process the Bureau would establish permanent vegetation monitoring sites (as we did on the Empire Ranch). These sites would be used under all alternatives to monitor rangeland health. The Bureau would also implement the utilization limit of 30 - 40% on both the Vera Earl and Rose Tree allotments and conduct utilization monitoring on at least an annual basis. If forage for livestock grazing was to be allocated and grazing use authorized in the Empire Mountains, utilization would also be monitored there.

Chapter 6: Public Comments and Responses

Letter 15, Page 3

15-14 cont.	acres of public land and should be subject to monitoring. How else can BLM ensure that the Standards and Guidelines are being met? Although this may seem a rather small amount of land compared to the entire planning area, it is significant and should not be ignored. Certainly the State Land Department will do little or nothing to protect the resource. (See also comment 4.)
15-15	14. <b>Chapter 2, p. 137 and p. 141.</b> With regard to Alternative 3, I have some confusion: page 137 indicates "90% less area designated as ACECs" while page 141 states, "less than under Alternative 2, which would have four times more area in ACECs." Do these figures accurately reflect the number of acres in ACECs in Alternatives 2 and 3?
15-16	15. <b>Chapter 2, pages 154-155.</b> Although the draft EIS refers to noxious weeds in several places, I can find little mention of invasive (both native and non-native) species as defined by the Executive Order 13112 of February 3, 1999. The term "noxious weed" is, most emphatically, <i>not</i> synonymous with "invasive species": the former term refers to a specific list of plants so designated by the U. S. Department of Agriculture and state departments of agriculture; the latter term is far broader and includes consideration of the impact of such plants on the environment as a whole, not just agricultural pursuits. The Executive Order was issued "to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause." Federal agencies, in Section 2, were ordered in part to " (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them."
15-17	16. <b>Chapter 3, p. 14.</b> Map 3-3, although incomplete, seems to accurately depict vegetative types. I am particularly pleased that xeroriparian areas are indicated. The biotic communities in such areas are quite different from the surrounding uplands and true riparian. Xeroriparian sites are rich in species diversity and provide habitat and movement corridors for a number of species.
15-18	17. <b>Chapter 3, p. 15.</b> I doubt the average reader will understand Table 3-7 without indicating that "pz" means "precipitation zone." Moreover, the inclusion of plant codes (e.g., POFR, SAGO, <i>Populus fremontii</i> and <i>Salix gooddingii</i> ) seems unnecessary, particularly since only a botanist would understand them and since most of the ecological sites have no key species listed.
15-19	18. <b>Chapter 3, p. 15.</b> The discussion of the effect of livestock grazing on the current ecological status of the area is very brief but excellent. Mention should be made

- 15-15. Thank you for your comment. Text has been clarified to reflect that under Alternative 2, 100% of the planning area would be designated as an ACEC. Under Alternative 3 only 10% would be managed under an ACEC designation. This results in Alternative 2 having ten times more area under ACEC designation than under Alternative 3.
- 15-16. That is correct, noxious weed and invasive species are not synonymous. In designating the NCA as a Weed Management Area, BLM is required to prescribe measures to treat those weeds listed on the State of Arizona Noxious Weed List if any were to be found on public lands in the NCA. Plant species that are disruptive to our management actions are considered invasive weeds and do not occur on the State of Arizona Noxious Weed List. BLM will treat invasive weeds, as feasible, in order to meet the objectives of Executive Order 13112 (which is referenced in our management guidance - Table 2-1), and text has been added to the plan clarifying this.
- 15-17. The data used to generate Map 3-3 were derived from ecological site inventories conducted on the Empire and Empirita ranches only. Therefore, the map reflects data coverage for these two ranches only. Under the Proposed Alternative, the ecological site inventory will be conducted for the remaining ranches within the planning boundary.

*Chapter 6: Public Comments and Responses*

**Letter 15, Page 3 (continued)**

15-18. Your comment has been noted and Table 3-7 has been modified.

15-19. Thank you for your comment. The text has been modified.

Chapter 6: Public Comments and Responses

Letter 15, Page 4

15-19 cont.	of the fact that livestock can select for unpalatable species, such as various forbs and shrubs, by reducing competition through consumption of desirable species.
15-20	19. <b>Chapter 3, p. 21.</b> In the first paragraph of column two, <i>Carex</i> is correctly identified as a sedge. In the third paragraph of column two, however, <i>Carex</i> is listed (incorrectly) with rushes. Stonewort ( <i>Chara</i> spp.) is listed in the first and third paragraphs. The genus is not included in Kearney & Peebles' <i>Arizona Flora</i> or in Lehr's <i>A Catalogue of the Flora of Arizona</i> (or the two supplements). Nor is the genus found in the International Plant Name Index, the Gray Index, or W3Tropicos. What is it?
15-21	20. <b>Chapter 3, pp. 24-25.</b> The second paragraph of column two states, "Of the 12.5 miles assessed in 2000, 100% were in satisfactory condition...." Table 3-9, however, indicates that 92% of the length was satisfactory. Which figure is correct?
15-22	21. <b>Chapter 3, p. 47.</b> What kind of ore was mined at Total Wreck? The paragraph on railroads which follows suggests it was silver.
15-23	22. <b>Chapter 4, p. 8.</b> The terms "desired conditions" and "desired vegetative conditions" should be defined to be the potential natural community (PNC) of the particular ecological site. Some range conservationists and ranchers would define both terms as plenty of forage palatable to livestock, whether or not the species are native or not. Indeed, I have read Arizona BLM allotment evaluations completed in the last two years that seem to define the desired condition as the status quo.
15-24	23. <b>Chapter 4, p. 22.</b> The last sentence in the "Cultural Resource Management" section refers, in the discussion of Alternative 1 impacts to water quality, to "the increased use of the Arizona Trail." The last section on this page is "Recreation Management and the Arizona Trail." The problem is that under Alternative 1, there would be no Arizona Trail.
15-25	24. <b>Chapter 4, p. 26.</b> It is highly possible that the increasingly higher water table will encourage sacaton dominance of the Agricultural fields and increased marshy areas, particularly if the canal dikes are breached in places to permit runoff from the uplands to reach the area. Given the rarity of sacaton sites and their importance to livestock grazing, the objective for the Agricultural Fields should be to restore sacaton and marsh habitats, not to provide a group recreation site.
15-26	25. <b>Chapter 4, p. 30.</b> Although mineral development might introduce exotic plants (which seems to imply direct introduction), it is much more likely that such development would create conditions facilitating the spread of exotics.
15-27	26. <b>Chapter 4, p. 31.</b> It is highly likely that grazing (as well as recreation and drought conditions) is contributing to the spread of Lehmann's lovegrass, and this should be mentioned in the draft EIS. The statement (top of column two) that "overall vegetation conditions are improving under current livestock management" is false given

- 15-20. Your comment has been noted and the text has been modified. Chara is a common and widespread macrophytic (large bodied) algae, not a higher plant which may explain its absence from the sources you cite.
- 15-21. Thank you for your comment. The correct figure is 92% of the 12.5 miles of Cienega Creek riparian area surveyed in the year 2000 were in satisfactory condition. Text has been modified. The data in Appendix 2 was the correct information.
- 15-22. That is correct. It was silver that was mined from the Total Wreck mine.
- 15-23. Desired Vegetative Conditions are the same as the Potential Natural Community of an ecological site in this plan. Both these terms can be interpreted as the community desired by the landowner and theoretically this may include either native or exotic species. However, BLM manages for Potential Natural Conditions which includes managing to eliminate exotic species. See also the definition for Potential Natural Community in the glossary.
- 15-24. Thank you for your comment. The text in Chapter 4 has been modified.
- 15-25. See response 4-1.



|

**Letter 15, Page 4 (continued)**

- 15-26. Although the Bureau concurs, we feel the statements “introducing exotic plants” and “promoting weed invasions” implies that mineral development would create conditions that would facilitate the spread of exotics. Anytime that land is cleared of native vegetation, exotics can be introduced directly by heavy machinery or indirectly by wind or birds, just to name some examples.
- 15-27. Lehmann’s lovegrass is a very successful invasive exotic species and seems to expand under almost all treatments. It has continued to spread across the Cienega and Sonoita Valleys, regardless of the land uses. Technically this grass detracts from the Potential Natural Community rating because the National Resources Conservation Service does not count exotics when calculating the condition score. However it is a tall perennial grass species and does provide excellent watershed cover.

Chapter 6: Public Comments and Responses

Letter 15, Page 5

15-27 cont	the explosion of Lehmann's in the last two or three years. Certainly any "improvement" in cover is not toward PNC.
15-28	27. <b>Chapter 4, p. 31.</b> I am very pleased that the draft EIS recognizes that impacts from dispersed recreation increase with increased use. I strongly believe this relationship is not linear, that is negative impacts to vegetation and wildlife increase faster than the increase in recreation.
15-29	28. <b>Chapter 4, pp. 37-38.</b> Although the section on Noxious Weeds is good as far as it goes, the document needs to address invasive species. Lehmann's lovegrass is not a noxious weed—indeed I would question whether there are any noxious weeds in the planning area that present a threat to the ecosystem to the extent that Lehmann's does. (See comment 15.)
15-30	29. <b>Chapter 4, p. 40.</b> Although I would agree that grazing at Cinco Ponds "would directly harm the riparian plant community and the longevity of open water", grazing may also reduce the habitat for bullfrogs—a real plus considering the plight of the Chiracahua and lowland leopard frogs.
15-31	30. <b>Chapter 4, p. 51.</b> The development of the Empire Ranch headquarters could negatively impact the Chiracahua leopard frogs with are now found only in Empire Gulch.
15-32	31. <b>Chapter 4, p. 59ff.</b> Although brief, this is a very good discussion of utilization as used by range conservationists.
15-33	32. <b>Chapter 4, p. 60.</b> I am pleased BLM recognizes that utilization data does not measure standing cover and recognizes this as "an important factor for many grassland species."
15-34	33. <b>Chapter 4, p. 66.</b> In addition to Chiracahua leopard frogs, turkey vultures frequently roost in the area. Increased visitation could effect both.
15-35	34. <b>Chapter 4, p. 67.</b> A designated road system and improved road access could facilitate the spread of invasive alien species (Lehmann's lovegrass, non-native fish, crayfish, etc.). Twenty years ago, I came across a large pool in a narrow canyon in the Rincons, several miles from the boundary, that had gold fish!
15-36	35. <b>Chapter 4, p. 79.</b> The layout on this page is confusing. The top four lines in column two belong to the first five lines in column one.
15-37	36. <b>Chapter 4, p. 94.</b> The draft EIS states, "BLM must be able to meet the needs and provide the services required by utility companies now and in the future." This is ludicrous as far as the NCA, <i>per se</i> , is concerned and must have been written by

Page 5 of 7

15-28. Thank you for your comment. BLM also assumes that the relationship between recreation and negative impacts to vegetation and wildlife is not linear. In addition, the overall cumulative impacts of all uses makes negative impacts on vegetation and wildlife occur more rapidly than recreation use impact only.

15-29. See Response 15-15.

15-30. Management for control of bullfrogs is ongoing. The presence of large bodies of open water has the potential of attracting bullfrogs. Adaptive management will be used to deal with bull frogs. Allowing these shallow waters to grow over with vegetation may be an option for controlling reproduction of this highly invasive frog, should it become present in the Cinco Ponds (*which had occurred as of the preparation of these responses*).

15-31. We agree with this statement and will work with the USFWS through Section 7 of the Endangered Species Act concerning this species and all activities and actions contained in the draft EIS.

15-32. Thank you for your comment.

15-33. Thank you for your comment.

*Chapter 6: Public Comments and Responses*

Letter 15, Page 5 (continued)

- 15-34. It is very difficult to include a discussion of all aspects of the avian community that exist in the planning area in the EIS. Vultures are under appreciated, yet serve an important role in the removal of carrion and re-cycling of nutrients contained in dead animal tissue. Vultures typically roost, in loosely knit groups, in large trees and on cliffs. These roost sites may change relative to a myriad of factors, including season, time of day, and food abundance. The role of human disturbance in roost abandonment is not fully understood. Vultures sometimes show a high degree of fidelity to a roost site and may be difficult to frighten away. BLM will attempt to locate trails, roads, camp groups, and other developments in a pattern which minimizes disturbance to all raptor species, including turkey vultures.
- 15-35. We agree with this statement and will face the difficult task of preventing and screening for invasive exotic species that may be released on the NCA and adjacent public lands. We will work with the USFWS through Section 7 of the Endangered Species Act concerning this issue as it relates to the draft EIS.
- 15-36. Formatting changes have been made.
- 15-37. Your comment has been noted and the text in Chapter 4 has been modified.

Chapter 6: Public Comments and Responses

Letter 15, Page 6

15-37 cont	a rights of way specialist wearing blinders. The primary purpose for creating the NCA was to protect not only the resource but also the viewshed. There is nothing in the Federal Land Policy and Management Act (FLPMA) that requires that every unit of public land be a potential site for utility rights of way. Moreover, I see nothing in The Act Establishing the Las Cienegas National Conservation Area that would suggest that BLM has such an obligation in the NCA. This sentence should be stricken.
15-38	37. Chapter 4, p. 109. Under "Recreation Management," should "Alternative 3 in the first line be "Alternative 4," which is what this section discusses?
15-39	38. Chapter 4, p. 109. The section "Livestock Grazing" states, "Requests to hold large or numerous livestock dependent events would increase." What is the rationale for this claim? What kinds of "livestock dependent events" are envisioned?
15-40	39. Chapter 4, p. 110. The assumption that "social trails" would increase without a designated Arizona Trail route is dubious at best. Indeed, the reverse could very well be true since more hikers would be drawn to the area. In Saguaro National Park and Pusch Ridge Wilderness, numerous "social trails" (I prefer the term "wildcat trails") has been developed in spite of an extensive network of official trails. Eliminating or discouraging wildcat trails is an on-going task, the same as with wildcat roads.
15-41	40. Chapter 4, p. 116. Impacts from undocumented aliens should be discussed under "Unavoidable Adverse Impacts."
15-42	41. Chapter 5, p. 2. Although "Workshop participants decided to have the partnership deal only with issues involving public lands surrounding the Sonoita Valley...", I believe the participants included state lands in the category of "public lands" although state lands, of course, are not public lands.
15-43	42. Appendix 2, p. 5. Executive Order 13112 should be mentioned in the discussion of Vegetation Management. Unfortunately it has been my experience that BLM and the Forest Service are quite unfamiliar with the Order and are doing little or nothing to implement it.
15-44	43. Appendix 2, p. 27. Another objective should be "Prevent the introduction and control non-native invasive species in the ACEC" or "Maintain or improve ecological site similarity to potential natural community"?
15-45	44. Appendix 2, p. 52. In the last paragraph, what is "Map X"?
15-46	45. Appendix 2, p. 53. The "Unit Size" section mentions maximum fire size in "broadleaf riparian areas." What evidence is there that any fire is a positive factor in such areas? Should not all burning in broadleaf riparian areas be suppressed?

15-38. Your comment has been noted and the text in Chapter 4 has been modified.

15-39 Currently, BLM receives many permit requests for equestrian events such as riding clinics, dog trial events, organized trail rides numbering between 20 to 60 riders, and horse endurance rides including 20 to 100 horse riders. BLM's experience in managing the San Pedro NCA has been that even though cattle grazing is no longer authorized, horseback use steadily increased because of the NCA status and promotion of the area. The knowledge that no grazing would be authorized (under Alternative 4) might initially attract more recreationists. Visitors may anticipate the use of the existing infrastructure left over from grazing development, such as corrals, watering sources and cattle trails.

## *Chapter 6: Public Comments and Responses*

### Letter 15, Page 6 (continued)

- 15-40. BLM receives inquiries from people who want to use the Arizona Trail, and others asking where to hike, ride or bike, even though there is currently no designated segment of the trail in the NCA. Currently hikers are asked to follow roads, pending the outcome of a trail alignment. Some already have expressed interest in guiding bicyclists through the narrows, an area that will be restored and where motorized or mechanical use will not be allowed. Others want to follow the creek, use some roads, or traverse cross country. The NCA will invariably be promoted at a national level, where promotion of recreation uses could conflict with some of the NCA's desired conditions such as the more primitive conditions prescriptions. It is anticipated that the NCA will be promoted by those marketing their personal business including recreation tourism web sites, books, brochures and other forms of advertising. Visitor use is expected to increase as the area becomes more widely known. When a trail is identified to channel use to a specific area, most people tend to stay on trails. If an established trail is in place most visitors will use it and stay on it. If there are no established trails, as often seen in other areas, random social trails can appear in undesirable areas, such as along riparian corridors or to sensitive archeological sites.
- 15-41. Thank you for your comment. Text has been added in Chapter 4 to describe the unavoidable adverse impacts of undocumented aliens.
- 15-42. You are correct, workshop participants did want to address both BLM lands and State Trust lands as public lands although State Trust lands are not public lands. However, the LCRMP prescribes management only for BLM managed public lands.
- 15-43. Text has been modified to reference Executive Order 13112 in Appendix 2 - Management Guidance.
- 15-44. An objective has been added for the ACEC that addresses invasive species.
- 15-45. An objective has been added for the ACEC that addresses invasive species.
- 15-46. Riparian areas bounded by relatively gentle topography and surrounded by semidesert grassland are going to burn even with a full suppression policy in place. The natural state of Cienega wetlands was one of frequent burning, such as the case with the surrounding vegetative community on the floodplains and uplands. Fire suppression has altered the plant community in favor of larger, older trees which would have been reduced to snags on a regular basis under normal fire frequencies of five to seven years. Much of the vegetation will be protected by humidity, and short stature during prescribed burning. This is neither meant to be beneficial or adverse to broad leaf riparian areas, but rather to recreate a vegetative community (Potential Natural Community) that is adapted to and appropriate for the ecological processes operating in the ecosystem including fire, flood, and elevated water tables.

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15-47

46. **Appendix 2, p. 64.** Although there is some debate as to whether traditional composition/production/utilization measures are adequate to accurately monitor ecological sites, the location and timing of any measurements are crucial in determining the true condition of a site. None of the traditional measures described in the "Upland Vegetation Monitoring" section provides a true measure of biodiversity and none is adequate by itself or in combination to determine how closely a site "mimics" the PNC of an ecological site. The Santa Rita Experimental Range, for example, has low utilization, high production, adequate composition, and good cover, but it is a far cry from the PNC—it is NOT a healthy grassland. The traditional measures of rangeland health are inadequate in determining whether sufficient stubble height/cover remains for wildlife or whether invasive, non-native species are causing problems. The traditional measures are too often used to define a "desired plant community" without regard of the PNC.

15-48

47. **Appendix 2, p. 71.** My name is misspelled (as it is in Appendix 5, p. 9).

15-49

48. **Appendix 3, pp. 45-46.** Species names for *Agave*, *Cylindropuntia* (the new genus name for chollas), *Manzanita*, *Nolina*, *Opuntia*, and *Yucca* should be provided—there are not that many species as may be true of *Aristida*, *Carex*, *Cyperus*, or *Juncus*.

15-50

49. **Appendix 3, p. 46.** Although they are given different common names, *Bothriochloa barbinodis* is the new name for *Andropogon barbinodis*, i. e., they are one and the same species.

15-51

50. **Glossary.** A xeroriparian area is not really a "streamside area" (which primary and secondary flood plains would be). Rather it is an area in a drainage (similar to, but usually deeper than, a swale) in which the vegetation is denser and generally more robust due to increased moisture. There is often not a channel, *per se*, and there may never be a visible flow. In some cases there is subsurface water.


Thank you for the opportunity to comment on the draft EIS.

Sincerely,



C. David Bertelsen

- 15-47. The BLM has an array of acceptable methods for the collection of vegetation attributes, including stubble height/cover. These methods are in accordance with our interagency technical references. BLM has tailored the methods to the local situation on Las Cienegas. This is what is referenced in the appendix.
- 15-48. Your comment has been noted and the spelling of your name has been corrected.
- 15-49. The list of species is not intended to be a complete list of those that occur on the NCA. Rather, it is a reference list of the scientific names of plants and animals which are included in the text of the RMP. Since the names of particular species for *Agave*, *Cylindropuntia* (cholla), *Manzanita*, *Nolina*, *Opuntia*, and *Yucca* are not mentioned in the RMP, only the genus names have been included in the table.
- 15-50. Text has been corrected in Appendix 3.
- 15-51. The definition of xero-riparian has been modified.



**Center for Biological Diversity**  
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SENT BY EMAIL AND ORDINARY MAIL November 21, 2001

Mr. David McInay, Acting Manager  
BLM Tucson Field Office  
12661 E. Broadway Road  
Tucson, AZ 85748

Dear Mr. McInay,

RE: Las Cienegas National Conservation Area draft EIS

**GENERAL COMMENTS**

**16- 1** The EIS is confusing as it applies in an unclear fashion to three overlapping planning areas. First there is the the Sonoita Valley Acquisition Planning District (SVAPD) established by the enabling act to acquire state and private lands into federal ownership. Roughly co-extensive with the SVAPD is the "Planning Area" for the proposed Resource Management Plan (RMP).

This leaves out some private lands in the SVAPD in the north, but includes other private lands past the mid-east boundary of the SVAPD for no clear reason. Finally within both planning areas, the actual NCA itself lies largely in the southern part of the SVAPD and consisting of most but not all BLM lands within the SVAPD and "Planning Area"

**NEPA**

**ARRAY OF ALTERNATIVES "UNREASONABLE"**

"NEPA's purpose is to protect the environment, not the economic interests of those adversely affected by agency decisions." Nevada Land Action Ass'n v. United States Forest Service, 8 F.3d 713, 716 (9th Cir. 1993)

An environmental impact statement must "(r)igorously explore and objectively evaluate all reasonable alternatives." 40 CFR 1502.14(a). "An appropriate series of alternatives might include dedicating 0, 10, 30, 50, 70, 90 or 100 percent of the Forest to Wilderness." (CEQ 1981).

**16- 2** The alternatives have been constructed in an unreasonable fashion. In particular alternatives 1-3 all dedicate over 80% of the federal lands to livestock, while alternative 4 has no grazing on federal lands. The problem with alternative 4 is that the highly dissected boundaries of BLM lands would have to be fenced on over 100 miles of boundary, at great

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CBD comments on Las Cienegas RMP/EIS page 1 of 31

16- 1. The planning area was selected to correspond to the Empire-Cienega long term management area which was established in the Land Tenure Amendment to the Safford RMP in 1991. Near the end of this planning process, which was to involve lands composing the Empire-Cienega Resource Conservation Area, Congress created Las Cienegas National Conservation Area, and also designated the Acquisition Planning District. During the legislative process, however, negotiations about the boundaries for the NCA and Acquisition District resulted in boundaries that do not exactly overlap with those of the original planning area.

16- 2. The EIS meets the CEQ regulations for implementing the procedural portions of NEPA (40CFR 1501.2 (c)) which state that an agency must "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources as provided by Section 102(2)(E) of NEPA". The Las Cienegas RMP was developed using a collaborative public planning process to identify the range of alternatives to be considered in managing the public land resources and uses in the planning area. The Las Cienegas RMP does not identify any unresolved conflicts that have not been adequately

*Chapter 6: Public Comments and Responses*

**Letter 16, Page 1 (continued)**

- 16- 2. (continued)  
analyzed in the EIS. The RMP analyzes a full range of alternatives for the various resources and uses on public lands in the planning area. For example, the grazing alternatives include current livestock management; adaptive livestock management with flexible stocking rates and management strategies; the traditional agency approach to livestock management with conservative fixed stocking rates; and removal of livestock grazing from public lands.



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Letter 16, Page 2

expense, to implement alternative 4 and so isolate all federal lands from adjoining state trust grazing leases and private ranchlands.

Although the BLM holds the state grazing leases on Empirita and Empire Cienaga ranches, it is currently not a simple option to end or greatly reduce grazing on these lands which are administered under state statute by the state lands department. Unless the BLM runs cows on the state leases, they could be turned into commercial leases or put up for auction.

However, a lawsuit pending before the state supreme court could change this situation entirely and allow the BLM to lease state lands at grazing rates but for conservation (i.e. cow-free) use.

16- 3 | By constructing alternative 4 in this absolute way, the BLM has created a "straw man" easy to knock down and by so doing violates the NEPA requirement that the alternatives be reasonable. We hope the BLM is not simply to evade the scientific and regulatory necessity of greatly reducing livestock use on these lands, contrary to the purpose of NEPA.

16- 4 | A central claim of the EIS is that by ending grazing on the federal portions, per alt 4, BLM will somehow lose control of management on the State Leases that it holds and ranches will become non-viable leading to more subdivision (p. 4.21), and management would somehow revert to "traditional grazing practices" leading to worse ecological degradation on state lands. All logic and available science is turned on its head with the specter that ending grazing on BLM lands would make everything worse in the watershed! This is an alarmist and spurious argument. In the description of alternative 2 the BLM develops a system of adaptive stocking applied to state leases under the BLM's control. Why is this adaptive stocking system not also applicable in alt. 4 with the BLM still holding the same leases? If present sublessees don't like BLMs terms and conditions for grazing state leases, then others no doubt could still be found.

16- 5 | The only permittee likely to be significantly affected by closure of BLM lands to grazing is the lessee for Empire Cienaga, who does not even own base property. So how is losing the BLM lease for this allotment going to result in a rash of subdivision? The EIS conveniently

16- 6 | omits mention of the enabling act's mandate to acquire lands to prevent urban development. This strong feature would be available to prevent urban development under all alternatives. The analysis of the impacts of the no grazing alternative is not objective or founded in real data or research, but founded on myths. The prime directive that drives the whole NEPA

16- 7 | process is clearly "[k]eeping ranches viable" (p. 4.21), not ecological recovery and protection of threatened habitats and species. This is a violation of the "objectively evaluate" obligation of NEPA as well as other applicable law.

16- 8 | An intermediate alternative should have been developed which would have excluded livestock from most federal lands but in such a fashion as to minimize additional fencing required. The map further below shows a more reasonable alternative which the BLM could have developed. Closing pastures of entirely BLM land that are already fenced, and adding short stretches of additional fencing in such a fashion as to leave State Lands and

CBD comments on Las Cienagas RMP/EIS page 2 of 31

16- 3. The No Grazing Alternative (Alternative 4) is a realistic approach to constructing an action that would allow the Bureau to cancel livestock grazing on all public lands within the planning area. There are an unlimited number of alternatives that could be constructed. The Bureau has worked with the interested public for five years to allow identification of feasible alternatives as described in response 16-2. These alternatives also follow 43 CFR 1610.4-5 and current policy and guidelines.

We agree it might initially be expensive to fence all the public lands from the adjacent lands, but it is feasible and would represent a clear alternative to the Bureau's authorization of livestock grazing on the public lands. We recognize that many other options to fence portions of the public lands exist and that construction of less than half this amount of fencing would exclude livestock from the majority of public lands. However partial fencing would still allow livestock access to some parcels if grazing continues on the surrounding lands. This variation has been added to Alternative 4 in the Proposed RMP/Final EIS.

16- 4. Adaptive stocking rates are not analyzed in Alternative 4 because this Alternative analyzes a no-grazing system. In addition, if the federal lands are removed from livestock grazing and grazing is to continue on the adjacent state and private lands, the ranches would need to be reconfigured. The Bureau managed lands tend to divide the valley east and

## *Chapter 6: Public Comments and Responses*

### Letter 16, page 2 (continued)

16- 4. (continued)

west along Cienega Creek, and north to south from the Whetstone Mountains to the Santa Rita Mountains. Thus if the public lands (approximately 50,000 acres) are removed from ranching use it would tend to create four quadrants of state (approximately 100,000 acres) and private lands (approximately 50,000 acres) with the federal public lands in the center. This would topographically create seven areas to either assemble as smaller ranches or place into residential subdivision. The smaller ranches would tend to be less viable. There would be less opportunity to design progressive grazing management strategies on these smaller units and they would be less desirable to the serious ranchers. A progressive adaptive stocking strategy and flexible rotation becomes more difficult for a rancher to develop as the resource base decreases. This is simply because there are fewer options available.

While the Bureau currently holds the grazing leases on the Empire and Empirita ranches, it is only a lessee and has no management control of State Trust Land. The Arizona State Land Department has its own mandates to manage the various trust properties under its responsibility. It would be speculative to assume that the state would subdivide these larger leases into smaller ones and allow the Bureau to continue as the primary leaseholder once federal lands are withdrawn, much less allow the Bureau to approve the lessees on the state leases. The lawsuit referenced in your letter has not been resolved through the court system and, again, it would be purely speculative to assume that the state would make these lands available for conservation leases or uses. Text has been added in several sections of Chapter 4 noting the variety of scenarios which could occur with management of State Trust Lands.

16- 5. As stated above, since the public lands are located in the center of the planning area, removal of the public lands from grazing would segment the area into four quadrants, leaving four smaller areas with which to create viable grazing units. It would be much more difficult to implement progressive grazing management on these smaller, less desirable parcels. It would also be difficult to create any economically viable grazing units with these smaller land parcels. Again, these parcels are composed of primarily State Trust lands and private lands. If they are not economically viable as ranches, it is likely that they will become residential property in the future.

16- 6. BLM has developed an Acquisition Strategy to guide acquisitions of lands or conservation easements within the Sonoita Valley Acquisition Planning District. The Acquisition Strategy has been incorporated into the RMP for alternatives 2, 3, and 4. It includes criteria for prioritizing acquisition parcels and identifies both traditional and non-traditional methods that could potentially be used to acquire lands or conservation easements.

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- 16- 7. The discussion centers around the viability of the ranch units because unless the ranch units are a viable economic venture, the land may ultimately be put into other economic land uses. As the ranches are fragmented into smaller units with less land available for grazing they become less attractive to ranchers. The current economic conditions which make these properties viable as ranching units are the dominant force holding the state, private, and public lands together as open, undeveloped land units. It is this “open” grassland landscape that the participants in the Sonoita Valley Planning Partnership, and many other interested individuals and groups are attempting to preserve.
- 16- 8. See also response 16-2. There are potentially an unlimited number of alternatives or variations to alternatives which could be analyzed. During development of the Land Use Plan and EIS, which lasted over a period of five years, the Bureau tried to analyze a range of alternatives that considered a variety of different possible land uses and conformed to CEQ regulations.

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some BLM lands open to grazing would present a cost effective alternative that would greatly reduce grazing on BLM land.

**NO PRIORITY ACQUISITION OR CONTINGENCY**

16-9 Priority land swaps and acquisitions which are mandated by the enabling act, should have been proposed as part of the alternative development process, to eliminate much of the intermixed nature of present landownership. This would allow for more cost effective livestock exclusion from most federal lands and make alternative 4 or a similar alternative much more feasible.

16-9 How lands are acquired into Federal ownership in future will significantly affect the feasibilities of different alternative, or even suggest new ones. At the least the Plan should contain a provision requiring complete Plan revision if key lands are acquired. An alternative could have been developed based upon successful completion of a priority acquisition program.

**NO WILDERNESS CONSIDERATION**

16-10 FLPMA directed the Secretary to consider not only of roadless areas of greater than 5000 acres as potential wilderness study areas, but also "roadless islands of the public lands." (43 USC 1782 (a)) The rejection of any wilderness consideration for these lands in the EIS pp 1.21-1.22 ignores this crucial statutory obligation. The EIS must review whether roadless islands exist which could qualify for wilderness designation. Certainly the large block around middle Gardner Cyn, which not coincidentally is also a key pronghorn area, may qualify as a WSA.

Whether a presently roaded area is potentially a roadless area or island depends upon future road closures. If any road closures will result in creation of roadless "islands" or >5000 acre roadless areas, then that area should be considered for as a valid WSA.

**WOODY INVASIONS AND FIRE**

16-11 All alternatives including the no grazing alternative are described as entailing extensive mesquite removals, primarily on Empire Cienaga which has the largest areas of encroachment. Is the purpose of these removals intended just to create more forage for cows?

Livestock grazing is recognized as the major factor causing the present level of woody encroachment of the former grassland and savannah that dominated the valley (pp. 3.15-17)

16-12 Cattle are fire suppressive and along with active fire suppression by agencies, have cause a massive shift toward woody plants like mesquite throughout the western US (see discussion below). Restoration would simply require removal of livestock and ending active fire suppression. The greatest factor causing erosion after fires is livestock as admitted in the EIS (p. 4.8). Resistance from landowners in the area (p. 4.12) could be addressed by maintaining back-burnt fire buffers, a combination of prescribed and natural fire regimes.

16-13

Climatic change due to global warming must also be factored in to consideration of woody invasions and fire cycles.

16-9. See response 16-6.

16-10. The statutory requirements of FLPMA and the Wilderness Act of 1964 have been met through BLM's review of the planning area to determine whether any lands therein have wilderness characteristics. Present direction for inventories, including wilderness character, is provided by FLPMA in Sections 102, 201, and 202. These sections direct BLM to "preserve and protect certain public lands in their natural condition" and to "prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including, but not limited to, outdoor recreation and scenic values), giving priority to areas of critical environmental concern."

Wilderness characteristics criteria are found in Section 2(c) of the Wilderness Act, which says in part, "An area of wilderness is further defined to mean in this Act an area . . . which . . . (3) has at least, five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition . . ." BLM's Wilderness Inventory and Study Procedures Handbook, H-6310-1, additionally states that "the size criteria will be satisfied for inventory areas in the following situations and circumstances:

. . Roadless areas of less than 5,000 acres of contiguous public lands where any one of the following apply:

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16-10. (continued)

- (1) They are contiguous with lands which have been formally determined to have wilderness or potential wilderness values, or
- (2) It is demonstrated that the area is clearly and obviously of sufficient size as to make practicable its preservation and use in an unimpaired conditions, and of a size suitable for wilderness management, or
- (3) They are contiguous with an area of less than 5,000 acres of other Federal lands administered by an agency with authority to study and preserve wilderness lands, and the combined total is 5,000 acres or more.”

In the review process, BLM identified potential inventory areas bounded by roads, non-public lands, or rights-of-way. The largest area so bounded on Las Cienegas has just over 4,000 acres of BLM lands and is bounded by a State highway on one side and a graded dirt road thoroughfare on two sides. Neither that area nor any of the smaller potential inventory areas met any of the above criteria, eliminating the need for any further evaluation of wilderness characteristic criteria.

The plan does not identify any future road closures that would create a roadless area of more than 5,000 acres. Also refer to page 1-21 of the Draft Plan regarding Wilderness.

- 16-11. The purpose of any mesquite removal would be to meet the vegetation objective for achieving the desired plant communities on appropriate ecological sites. Where mesquite has invaded into open grasslands sites the objective would be to reduce this condition. While it may produce more livestock forage, it also produces more desirable antelope habitat and better watershed condition. Thus, this action is proposed in Alternative 4, under which livestock grazing would not even be an authorized use.

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- 16-12. If cattle are allowed to graze heavily, they can remove the fuels that carry fire through the plant community. Under current management, and in all proposed alternatives, vegetation objectives and management guidelines have been established that will allow fire to be used as an active process where applicable, along with appropriate livestock numbers and utilization levels. With appropriate utilization levels and livestock numbers, sufficient fuels are left to carry fire through the plant communities. This in turn, allows fires to be prescribed to support the restoration of appropriate vegetation communities. As an example, a recent wildfire burned approximately 4,600 acres along Cienega Creek and the adjacent uplands. This fire occurred after the growing season, and after livestock had already grazed the pastures but sufficient fuels were left to carry the fire over an extensive area. If livestock grazing is allowed in areas too soon after the occurrence of fire, they can increase soil erosion and cause considerable damage to the plant communities. It is our intention to rest areas from livestock grazing until those ecological sites have recovered. This is another value of the larger grazing units that would offer more opportunities to change proposed livestock rotations due to unforeseen events and for the biological planning process that provides an opportunity to adjust livestock strategies and/or numbers when these unforeseen events occur.
- 16-13. See response 10-5 above.

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**GLOBAL WARMING**

Multi-agency reports about impacts of global warming, are available but the EIS fails to consider the impacts of grazing in the context of this likely future environment (Southwest Regional Assessment Group, 2000). Rather the EIS is founded in the untenable assumption that climate will continue much as it is now with occasional droughts.

16-14

Temperatures in the southwest are predicted to rise 2-3°C by 2030 while rainfall especially in winter is expected to increase due to increased frequency and persistence of El Niño events. This is expected to "increase the number of floods, [and] accelerate rates of soil erosion" (SWRAG 2000 p. 3). The authors warn that "There have been significant long-lasting declines in the productivity and condition of many semi-arid rangelands, after various combined impacts of drought and heavy livestock use. The combination of low plant cover (especially after drought) and the sometimes intense rainfall events...can cause severe soil erosion."

They also warn not to expect greater productivity of rangelands to result because "the correlation between productivity (of forage or of other plants) and precipitation is not always strong" and because of "[d]esertification, or the long-lasting deterioration of semiarid ecosystems" in the Southwest (SWRAG 2000 pp. 31-31).

Increased winter rainfall may instead help to accelerate woody encroachment already a problem on this allotment (Brown et al. 1997) and increase risk of wildfires, further worsening soil loss and impaired air quality from increased dust in the air, a possibility neglected in the EIS (SWRAG 2000 p. 32).

The BLM failed to develop and analyze the alternatives considering an increasing risk of erosion and disruption of vegetative health.

Also ignored is the expected impact of warming on plant phenology resulting in earlier spring growth which could make reliance on "deferred" grazing schedules meaningless.

**A PROPOSED RESTORATION ALTERNATIVE**

16-15

We propose that the EIS be withdrawn and more reasonable "restoration" alternative be developed and analyzed with the following essential features (see figure next page):-

- ?? Fenced exclusion of most if not all Federal lands from livestock on the Empire Cienega allotment
- ?? Fenced exclusion of all BLM lands from livestock on the Vera Earl allotment.
- ?? Maintain BLM lands on Empirita allotment excluded by herd management
- ?? Maintain BLM lands on the Empire Mtns excluded by herd management
- ?? Priority acquisitions of state trust lands (as indicated) that expand protection around riparian habitat and provide wildlife corridors, to be added to livestock enclosure as acquired

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16-14. Global climate change is a well documented phenomenon. However, scientists do not completely understand global climate change and cannot accurately predict what its impacts might be in southern Arizona. There is even less certainty about what, if any, impacts global warming might cause in the planning area. As conditions affecting the ecosystem process, such as rainfall, air and soil temperature and evaporation rates, change all uses will have to be adjusted to the extent necessary to protect ecosystem integrity. Should the situation become severe, adjustments could include curtailment of grazing, and changes in certain types of recreational activities. In general, land management in the context of global warming will have to be "adaptive" relative to changing conditions and the best scientific information available at the time.

16-15. Your proposed Restoration Alternative appears to be a variation of Alternative 4. The following features in your Restoration Alternative are already included in Alternative 4 in the Draft Plan:

\* Fenced exclusion of public lands from livestock on the Empire-Cienega, Empirita, Vera Earl, and Rose Tree allotments.

\* Priority acquisitions of State Trust Lands (an acquisition strategy for lands with the Sonoita Valley Acquisition Planning District has been developed and incorporated into Alternatives 2, 3, and 4).

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16.-15. (continued)

\* No livestock crossings of permanent creeks and no watering access points at natural springs or riparian zones (as no livestock would be present on the allotments).

\* Restriction of the Trail to existing roads or trails.

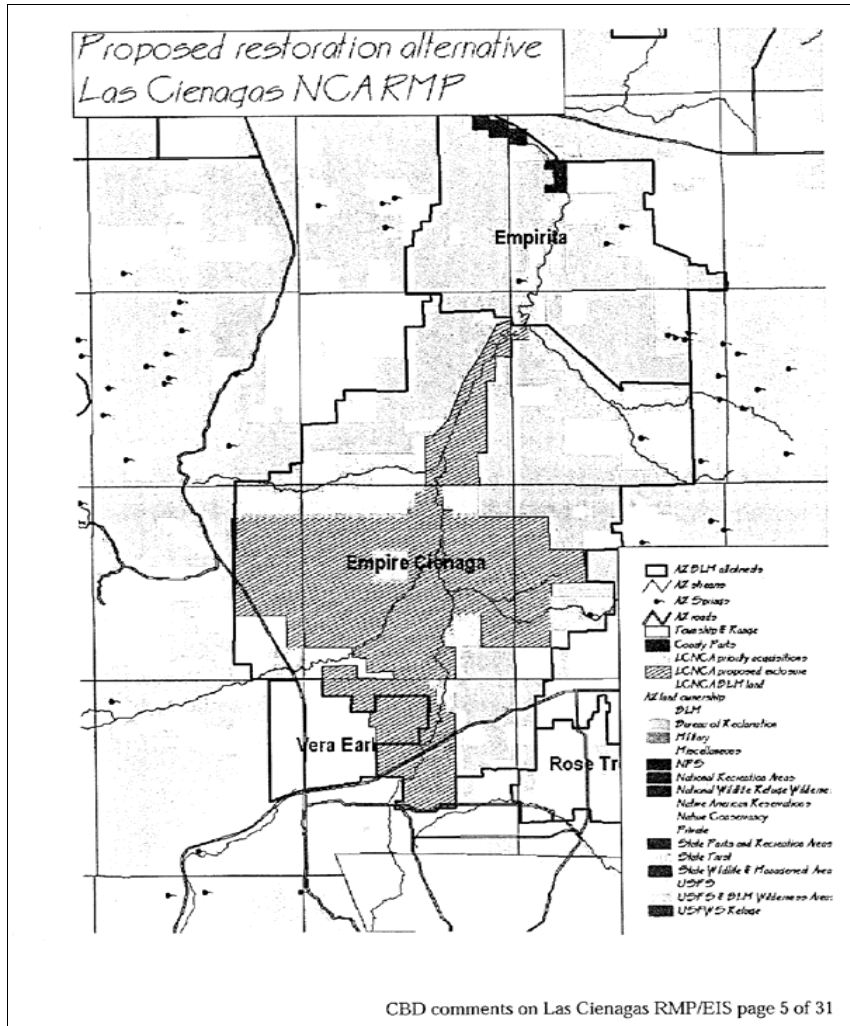
\* Mineral withdrawals as in Arizona Alternative 2.

\*Recreation zones 1 and 2 are not within 1/4 mile of permanent water in Cienega Creek.

We have incorporated your ideas regarding a phased in approach to removal of livestock from public lands into Alternative 4 which would result in less fencing being required and additional restrictions on livestock use of riparian areas in the interim while the use was phased out. We have also incorporated the potential scenario of conservation use of State Trust lands into the variety of potential management scenarios for State Trust lands under Alternative 4.

As discussed in response 10-5, there are several factors which preclude the option of letting wildfires burn on public lands under any alternative including urban interface issues, resource concerns, and current policies. Hunting use is regulated by the Arizona Game and Fish Commission. Alternative 4 is the most restrictive of the four alternatives on motorized recreation and access.





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- ?? No livestock watering access points at natural springs or riparian zones.
- ?? No livestock crossings of permanent creeks except by truck, or on concrete or gravel crossings or bridges. Only one crossing per allotment.
- ?? Closure of all but several major trunk routes to all motorized access, and conversion of some closed roads to trails to retain non-motorized access. Prohibition of entry to any motorized vehicle not licensed for street use onto the NCA.
- ?? Livestock utilization for a minimum stubble height of 6 inches on federal and state rangelands.
- ?? Restriction of the Arizona Trail to existing roads or trails.
- ?? No expansion of existing utility corridors.
- ?? Natural fire "unmanagement" or "let it burn" policy except for ¼ mile around buildings. Back burning of firebreaks around buildings.
- ?? Mineral withdrawals as in Alt 2.
- ?? No recreational or hunting entry away from designated open roads more than 50 yards into pronghorn fawning areas during fawning season. Designate zone 1 & 2 recreation sites away from all areas of likely wildlife conflicts, and not within ¼ mile of permanent water on Cienaga Ck.

**GRAZING**

*THE SCIENTIFIC RECORD*

16-16

The enabling Act requires the Plan to have "provisions designed to ensure the protection of environmentally sustainable livestock use on appropriate lands within the Conservation Area." (6(b)(7))

All available science brings into doubt the very conception of "environmentally sustainable livestock use." There exists no published peer reviewed science which shows that a particular economically viable livestock management regime other than complete removal of livestock is environmentally sustainable in the sense of avoiding possibly irreversible harm to natural ecosystems. Every available study shows otherwise. Historically livestock have resulted in massive soil loss and vegetative shift in southwestern ecosystems.

*"Probably no single land use has had greater effect on the vegetation of southeastern Arizona or has led to more changes in the landscape than livestock grazing range management programs. Undoubtedly, grazing since the 1870s has led to soil erosion, destruction of those plants most palatable to livestock, changes in regional fire ecology, the spread of both native and alien plants, and changes in the age structure of evergreen woodlands and riparian forests."* (Bahre 1991).

Stephen Yool comparing Chihuahan desert exposed to long term grazing with areas recovering from the first atomic bomb blasts, found significant recovery in the blast area, but

- 16-16. This mandate would be achieved through actions designed to accomplish our resource objectives, as stated in the Land Use Plan. We are in the process of successfully reaching these objectives on the Empire-Cienega Ranch. Locations exist where riparian areas are being restored as habitat for endangered fish and wildlife, barren sand washes are being stabilized with the return of perennial grasses, and desirable perennial grasses are returning to upland areas where they had been removed by past grazing practices.

little in the grazed areas (Yool, 1999). He concluded that grazing damage was more severe than nuclear bomb damage.

*Riparian impacts*

Healthy streams in the Southwest usually have a narrow, deep channel. Sediment-capturing grasses and galleries of willow, box elder and cottonwood forests stabilize the stream banks. This "riparian" habitat dissipates high stream-flow energy that otherwise can be destructive and provides the water, food, shade, nesting sites or cover for about 80 percent of all wildlife in Arizona and New Mexico (Ohmart 1982 1996, Chaney et al. 1990).

But livestock, particularly cattle, have a dramatic impact on these fragile areas, trampling and abrading stream banks, snapping tree seedlings and denuding vegetation by devouring grasses, seedling trees and other leafy green plants. Riparian vegetation provides the bulk of forage for livestock, which only reluctantly move far from water (Holechek 1998, p. 256). A 1994 U.S. Bureau of Land Management report estimated that livestock had "damaged" 80 percent of the West's riparian areas (U.S. Bureau of Land Management 1994).

Belsky and others (1999) reviewed more than 120 published scientific studies on the effects of livestock grazing on riparian areas and their report found:

- ?? Reduced herbaceous cover, biomass, productivity and native species diversity (14 studies).
- ?? Reduced diversity and abundance of native reptiles and amphibians (four studies).
- ?? Wider stream channels, less stable banks, higher peak water flows (16 studies).
- ?? Reduced soil fertility, water infiltration and resistance to erosion (12 studies).
- ?? Higher water temperature and lower dissolved oxygen (five studies).
- ?? Reduced tree and shrub cover and biomass (eight studies).
- ?? Shift from cold-water fish and aquatic invertebrates to warm-water species (eight studies).
- ?? Higher water loads of sediments, nutrients and pathogens (10 studies).
- ?? Lower water tables (two studies).
- ?? Shift from riparian bird species to upland-generalist species (six studies).

The Belsky report stated that an "... extensive literature search did not locate peer-reviewed empirical papers reporting a positive impact of cattle on riparian areas."

Similarly, Ohmart's 1996 study concluded: "... there is not a single grazing management approach that has produced consistent improvements of degraded riparian-wetland areas."

(Elmore & Kauffman, 1994) found that the much vaunted "winter-only grazing" on riparian areas still resulted in significant damage and prevented full recovery of riparian natural vegetation.

Other scientists have come to similar conclusions. Two separate studies found that tree seed and sapling survival rates were reduced up to threefold in grazed riparian areas in Southeastern Arizona compared with those devoid of livestock (Glinski 1977, Szaro 1983).

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Also in Southeastern Arizona, an ornithological study found negative livestock-grazing impacts on 17 of 43 neo-tropical migratory bird species (Bock et al. 1992).

Riparian areas can recover from the damages of livestock grazing if livestock are removed. Trout recovered significantly in Pacific Northwest streams closed to livestock (Bowers, et al. 1979); and riparian canopy-dependent bird species increased 20-fold along the San Pedro River after cattle were removed in 1986 (Krueper 1993).

#### *Watersheds*

Impacts of livestock on stream and water conditions go well beyond just immediate impacts to riparian areas. Impacts across the watershed affect stream and water quality. Conversely, damages to riparian areas extend out to entire watersheds.

Livestock grazing, even at modest levels, in upland areas of watersheds is found to produce greater soil erosion. This effect is greatest when the grazing occurs during a rainy season (Smien 1975). The phenomenon has three basic components. First, grazing reduces plant cover that binds the soil and, in low desert areas, destroys microbiological soil crusts that stabilize soil surfaces (Beymer and Klopatek 1992, Brotherson, et al. 1983, Brotherson and Rushforth 1983). Second, vegetation that impeded overland flow of rainfall runoff in intact watersheds was lost to grazing (Sharp, et al. 1964). Third, grazing livestock compact the soil, so instead of rainfall soaking down toward the aquifer it flows faster and in greater volume overland (Arnold 1950, Johnson 1956; reviewed by Belsky et al. 1999, Jones 2000). Eroding soil and manure throughout watersheds end up in streams as increased sediment load, excessive nutrients and pathogen contamination. Various grazing management strategies have not been found to reduce such watershed degradation (Gifford and Hawkins 1976, Blackburn et al. 1982).

The converse effect is the dropping of water tables that results from stream down-cutting in grazed riparian areas. A number of authors have outlined the model whereby trampling and loss of stabilizing vegetation due to grazing in riparian areas results in higher peak water flows, channel scouring, erosion and down-cutting, which in turn lowers water tables, ends permanent stream flows and dries out watersheds (Kovalchik and Elmore 1992, USBLM 1994, Trimble and Mendel 1995, Belsky et al. 1999)

#### *Upland impacts*

Away from the immediate vicinity of riparian areas, livestock damage native plants and the soil in which they germinate and take root.

The published results of Jones' review (2000) of 54 studies of arid grasslands throughout the West showed grazed areas averaged 80 percent more soil erosion, 24 percent less biomass, and 45 percent less biological soil crust coverage than comparable ungrazed areas.

Biological soil crusts contain algae, lichens, mosses and microbes that reduce erosion, enhance water infiltration, fix nitrogen and prevent exotic-weed germination. Other scientific studies found these valuable soil crusts are reduced significantly in areas where livestock graze (Beymer and Klopatek 1992, Brotherson, et al. 1983, Brotherson and Rushforth 1983).

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In 1994 T.L. Fleischner reviewed 11 studies that showed livestock grazing had negative impacts on native plant communities in the West. Among the impacts cited were decreased ground cover, reduced biomass, and less species diversity.

Even regularly grazed mine tailings had less herbaceous cover than either un-grazed plots or mine tailings that were bladed and reseeded (Lash, et al. 1999).

Several studies in the Sonoita valley southeast of Tucson found vegetation more abundant and more diverse in ungrazed areas than in grazed comparison areas. Perennial grass covered 80 percent of un-grazed lands compared with 56 percent of grazed lands in one study (Bock and Bock 1991). Winter annual plants were more abundant in ungrazed areas (Kelt and Valone 1995). Plant-species diversity was reduced in grazed areas (Heske and Campbell 1991).

Perennial grasses were four times more abundant on Dutchwoman Butte in Tonto National Forest east of Phoenix, a mesa inaccessible to livestock, than in nearby lowland areas to which livestock have access (Ambos et al. 2000).

With development of more and more new watering troughs to "achieve better livestock distribution" by federal agencies, upland sites previously relatively free of livestock damage are being subjected to increasing damage, transferred from riparian areas. This damage still impacts riparian areas and water quality by increasing upland erosion and watershed flashiness.

#### *Vegetation shifts*

After livestock have eaten native plants, or altered the soil and water conditions so natives no longer can survive, the land is open to exotic weeds and to proliferation of woody species such as juniper, mesquite, manzanita and pines (Arnold 1950, Brown et al. 1997). Schiffman found in 1997 that livestock grazing left bare ground, facilitating weed invasions.

Natural cryptobiotic soil crusts inhibit weed germination, but grazing livestock break up these crusts (Kaltenecker and Wicklow-Howard 1999, Eckert et al. 1986, Mack 1989, Rosentreter 1994).

Schiffman's 1997 study found that livestock feed containing seeds of exotic weeds and other plants led to their introduction to grazed areas. Numerous studies have found higher concentrations of exotic weeds in grazed areas than on comparable ungrazed lands throughout the West (Daubenmire 1975, Stromberg and Griffen 1996, Robertson and Kennedy 1954, Goodwin, et al. 1999, Rickard 1995).

Studies have found that livestock tend to avoid eating some of the exotic weeds, giving them another advantage over native plants (Lacey 1987, Olson, et al. 1997).

Further adding to this problem are the many stock tanks that ranchers have created to attract livestock to waterless upland areas. As noted above, livestock congregate around water sources. Thus nitrogen from manure is concentrated around stock tanks, and around them soil is compacted and cryptobiotic crusts are broken up. This leaves considerable

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amounts of defoliated, bare soil (Andrew 1988). These areas are prone to exotic-weed invasions (Richard 1995, Nash, et al. 1999).

In Sonoran desert, prickly pear cacti and creosote bushes displacing ocotillo plants and columnar cacti, such as saguaros, due to direct livestock trampling or because grazers eat shade-providing "nurse plants" (Blydenstein, et al. 1957, Abouhaider 1992, Pierson and Turner 1998). J.E. Bowers (1997) found a similar phenomenon occurring in the Grand Canyon area.

#### *Forest impacts*

Some native bunch grasses chemically inhibit pine seedlings (Jameson 1968, Rietveld 1975), and other native grasses have competitive advantages over woody species and weedy annuals (Rummell 1951, Belsky and Blumenthal 1997). Livestock grazing on native grasses thus has allowed upper-altitude grasslands to be taken over by pinyon, juniper and other conifer species (Martin 1977, Arnold et al. 1964, Swetnam et al. 1999).

Grazing has removed the principal fuel of pre-historic and early historic native grassfires. This new regime of grassfire suppression has contributed to massive grassland loss and its replacement with chaparral and woody thickets (Hill 1917, Leopold 1924, Madany and West 1983, Arnold 1950, Covington 1992).

Direct grass losses to livestock grazing, and related losses of natural periodic grass fires that also inhibit conifer seedling survival, have allowed thickets of spindly Ponderosa pines to encroach into previously "open, park-like" forest-savannahs dominated by large pines with lush native-grass understories. These crowded conditions for pines leave the spindly trees much more susceptible to insect and mistletoe attacks. When fire comes to these unhealthy pine thickets, the resulting conflagrations are devastating - fires rage up in the canopies of the tree thickets instead of burning native grasses on forest floors (Belsky and Blumenthal 1997).

#### *Wildlife impacts*

The many impacts to riparian areas, grasslands and forests that livestock grazing has wrought have direct effects on wildlife. Grazing also can affect wildlife indirectly by causing detrimental impacts on species down the food chain. In natural ecosystems, predators are atop the food chain and serve as essential checks on herbivores. Without this regulation, herbivores can devastate vegetation communities.

Livestock grazing, however, has been so widespread in the West that it has depleted predators' key herbivore prey. Ranchers, or government agencies acting on behalf of the livestock industry, have slaughtered untold millions of predators. Federal "Wildlife Services," for decades known as "Animal Damage Control," traps, shoots or poisons vast numbers of coyotes, bobcats, wolves, mountain lions and prairie dogs to benefit livestock grazing. The agency killed 85,751 animals in 1997 alone (U.S. Wildlife Services 1997).

The ranching industry was a primary cause of the extirpation from the Southwest of wolves, jaguars, grizzly bears, beavers and Merriam's elk (Wagner 1978).

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Scientists have identified prairie dogs as "keystone" herbivores in Western grasslands, as well as in the prairies to the east. Prairie dogs once provided food and shelter for 170 species, including Black-footed ferrets (now endangered), hawks, burrowing owls, mice and snakes. Poisoning to benefit the ranching industry and habitat degradation of livestock have reduced prairie-dog populations to 2 percent of their historic range (Baskin 1997).

Cattle negatively affect pronghorn antelope by depleting key browse species on critical wintering grounds. Cattle can exclude deer from available habitat and greatly reduce fawn survival. The presence of cattle in Montana is associated with elk densities of approximately one-half of what they are on ungrazed lands. Overall, the grazing of livestock on rangelands is to be expected to have negative impacts on wild ungulate species (Mackie, 1978; McNay, 1982). Pronghorn fawn production has jumped up in recent years after closure of the Hart Mtn Antelope Refuge in Oregon to grazing in 1991. This is despite no predator control program on the refuge.

The Jones (2000) review of 54 studies of arid grasslands in the West found rodent species' diversity averaged 22 percent lower in grazed areas than in comparable areas without livestock grazing.

One recent study found four times as many insects in ungrazed areas than in comparable areas subject to livestock grazing (Rambo and Faeth 1999).

In Sonoita Valley southeast of Tucson animals that need grass cover, such as the Bunchgrass lizard, are lost or reduced in grazed areas compared to similar areas without livestock grazing (Bock et al. 1990). Nineteen species of ground-foraging, seed-eating birds were 2.7 times more abundant in an area without grazing (Bock and Bock 1998). Reduced abundance and diversity of small reptiles, mammals and birds has a "bottom-up" impact on predators dependent upon them, such as endangered Mexican spotted owls and Cactus ferruginous pygmy owls (U.S. Fish and Wildlife Service 1995, U.S. Fish and Wildlife Service 1999).

Stock tanks for grazing livestock harbor "source populations for ... non-native fish" that are swept during heavy rainstorms into streams. These exotic fish either eat imperiled native fish or out-compete them for scarce food supplies (U.S. Fish and Wildlife Service Biological Opinion 1999, p. 263).

Livestock have behavioral effects on other wildlife. Elk and mule deer avoid cattle and the areas they have grazed, even if the bovines were in "moderate stocking" numbers (Loft 1991, McClaran 1991, McIntosh and Krausman 1981, Wallace and Krausman 1987).

#### *Grazing and Disease*

Grazing livestock also have a negative impact on ecological systems in the West in that they introduce new diseases to wildlife and humans, and exacerbate occurrences of other diseases.

Pronghorn antelope and bighorn sheep were found to suffer increased mortality in sheep- and goat-grazed rangelands (Yoakum 1975, Goodson 1982). The myxozoan parasite of trout,

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the cause of the often-fatal "whirling disease," is more common in degraded, warmer waters associated with livestock grazing (George Wuerthner, pers. comm.).

Infected cattle introduced brucellosis to elk and bison in the West (Meagher 1994). Cattle also carry the human gastrointestinal parasite *Cryptosporidium parvum*, common in streams around which cattle congregate and not easily killed by ordinary water purification methods (*Cryptosporidium White Paper*, San Francisco Public Utilities Commission 1997, *Arizona Daily Star*, May 3, 1996, p. A-3).

#### *Grazing and Imperiled Species*

The negative impacts of livestock grazing on imperiled (threatened or endangered) species are numerous and severe. Flather et al. (1994, 1998) synthesized data on 667 threatened and endangered species for the years 1976 to 1994 for the Forest Service.

Flather's research identified livestock grazing as a factor in the endangerment of 15 of the 27 species then listed as threatened or endangered in the Southwest. Grazing was the top cause of species endangerment followed by Erosion, Exotic species invasions, Predation, Mining and Heavy equipment use. As of 2000 there were 90 threatened or endangered species, including 34 plants, 10 mammals, 4 invertebrates, six reptiles or amphibians, 26 fish and 9 bird species. Clearly the endangerment of fish is closely related to the drying up streams by the twin processes of pumping for agriculture, mining and housing and stream degradation by livestock. However as Chaney (1980) observed, most desert species depend on riparian areas at some point in their lives. Jaguars and large predators as well as many birds like the Southwestern Willow Flycatcher prefer to search for food along streams.

The Flather study identified the desert southwest as an imperiled species "hotspot," primarily for animals.

The U.S. Fish and Wildlife Service, the federal agency charged with protecting imperiled species, recognizes the negative impacts of livestock grazing on federally listed species. The agency's 1997 Biological Opinion on the Bureau of Land Management's Livestock Grazing Program in Safford and Tucson, made these statements about grazing:

For Pima pineapple cactus -- "Adverse effects of grazing include trampling by livestock; habitat loss and degradation associated with construction of range improvements; vegetation manipulations such as chaining, prescribed fire, seeding with non-native plants and imprinting; and ... erosion, changes in vegetation communities, hydrology and microhabitats in uplands where the species occurs." - p. 74.

For Huachuca water umbel -- "Livestock grazing can affect the umbel through trampling and changes in stream hydrology and loss of stream-bank stability." - p. 98.

For Gila topminnow -- "Direct effects [of livestock grazing] include trampling of and ingestion of fish eggs and larvae by cattle". "Effects of cattle grazing on watersheds include alterations of vegetation communities, increased soil erosion and runoff, decreased infiltration rates, damage to cryptobiotic crusts, and increased soil compaction... Degradation of watersheds can cause down-cutting [of stream banks], loss of perennial flow, loss of riparian vegetation, increased sedimentation, and higher peak flows in streams and rivers." - pp. 137-138.

For Southwestern willow flycatcher -- "The overuse of riparian areas by livestock has been a major factor in degradation and decline of willow flycatcher habitat. Grazing in the riparian area during the growing season of willows and cottonwoods often precludes their regeneration. These trees, particularly willows, are favored by this species... When cattle grazing is reduced or eliminated, willow flycatcher numbers can rebound. **Direct**

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**destruction of nests, eggs, and nestlings by foraging cattle has been documented.** Trampling of banks and reduction in riparian vegetation due to grazing can cause changes in channel morphology and stability that can further adversely affect riparian plant communities... Livestock tend to concentrate in riparian areas for forage, water and shade, due to the aridity of the surrounding uplands... [There is] a **tendency to cause degradation of riparian areas regardless of the stocking rate.**" - p. 197 (emphases added).

For Cactus ferruginous pygmy owl -- "... the loss of riparian habitat to a variety of uses, including livestock grazing, is considered one of the causes contributing to the decline of the pygmy-owl... Damage to riparian areas from grazing ... can be long lasting and potentially irreversible. ... unregulated livestock grazing has been implicated as one of the primary causes of decadent age structures of trees, where stands have large old trees, but few saplings or small trees... reduced seedling establishment can result from browsing, trampling of seeds, and reduction of a stabilizing herbaceous cover. Soil compaction associated with grazing can reduce the growth rate of existing trees by decreasing water percolation and the abundance of mycorrhizae and other critical soil components." - p. 225.

**BEST AVAILABLE SCIENCE**

16-17 | Very little of the foregoing evidence, which constitutes the best available science on grazing is referenced in the EIS, a probably violation of ESA which requires use of best available science, and NEPA which requires "scientific integrity", accuracy and high quality in assessing impacts.

**GRAZED AREA WOULD INCREASE**

16-18 | Despite all available evidence, the proposed action would actually increase the area of federal lands exposed to the damage of livestock grazing by establishing a new livestock grazing allotment on BLM lands in the Empire Mountains presently closed to livestock. The NCA's enabling legislation states that livestock grazing, "shall" be permitted but only in "appropriate areas" and subject to all applicable federal land management laws and regulations in particular the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq. "FLPMA").

16-19 | The EIS proposes creating 2319 acres of enclosures (not including Appleton Whittell) to "allow for comparison of conditions... in relation to grazing management" (p. 4.11). This is entirely unnecessary.

We already have more than enough evidence to show that grazing at the levels proposed is injurious to ecological function, and would prevent full recovery of native wild habitats. This evidence is cited at length above. Appleton Whittell itself is a perfect example of the level of recovery that can take place if cows are removed. The EIS fails entirely to discuss this important example of what the future could look like without cows, except in the extremely limited context of the value of enclosures for comparison with grazed areas.

**LESSONS OF THE APPELTON WHITTELL PRESERVE**

16-20 | The EIS fails to cite the much other work on Appleton Whittell contrasting this 30+ year cowfree area with adjacent grazed areas in which they report that grasses in winter on the AW were taller (4.4-fold) and had higher basal area ground cover (2.5-fold), canopy cover (2.2-fold), and reproductive canopy cover (10-fold) than in the grazed area after a drought. 19 species of ground-foraging, seed-eating birds (e.g., doves, quail, sparrows, towhees) were 2.7 times more abundant. Significant differences persisted even after a year of reduced stocking

16-17. Under the heading "Best Available Science," the CBD's letter makes reference to numerous quotes from newspaper articles, study reports or publications addressing a variety of subjects and geographical locations including global warming, insect and mistletoe attacks on Ponderosa pine, animal damage control, prairie dogs and black-footed ferrets as keystone species in western grasslands, mortality of antelope and bighorn sheep in "sheep and goat grazed rangelands," whirling disease among trout, brucellosis among elk and bison in Yellowstone National Park, implied effect of cattle on elk populations in Montana, and non-native fish from stock tanks invading native species in the Tonto National Forest. These references are not applicable to the EIS which concerns the Las Cienegas planning area as they address very different ecosystems or species which are not found and historically never occurred in the planning area.

The people who collaborated to conceive the ideas used to formulate and write this management plan and EIS, include specialists and scientists from the private, state and federal sectors. Many hold graduate degrees in their particular disciplines and have many years of applied field experience. All the people who participated brought critical thinking skills into the process, and spent hundreds of hours sitting together in meetings to discuss issues, objectives and solutions, or visiting various locations throughout the planning area to examine the resources firsthand, and then reach conclusions acceptable to often widely diverged opinions and ideologies.

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16-18. See responses 2-9 and 2-10.

16-19. There is a need to have some lands, adjacent to the grazed lands, excluded from grazing use. These ungrazed areas are needed to compare the impacts of various grazing treatments on the ecological sites to evaluate effects from livestock management practices on the soils and plant communities. We need to observe the different responses so we can make changes in management if results are different than expected. In scientific studies control areas are needed to isolate variables in the study so that observed differences can be attributed to the causative actions.

16-20. We will incorporate as appropriate research studies from The Appleton-Whittell ACEC (Audubon Research Ranch) which appear applicable to the analysis. We agree that the Audubon Research Ranch is an important asset to use in our studies of the effects of grazing, as well as land management actions and uses on other portions of the Las Cienegas NCA. In fact, data derived by studies at the Research Ranch have been used, and comparisons made, on a variety of topics including the use of prescribed fire, grazing use and bird populations among others. We intend to continue working with the Research Ranch staff to develop projects and conduct studies as the opportunities arise. Not all the studies conducted at the Research Ranch have shown that livestock grazing adversely affects the environment. Where studies do show adverse effects from grazing, we hope to be able to use the results to make changes to improve management within the NCA.

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in response to drought on the grazed areas. Bock & Bock, (1993) also found that grass canopy cover was greatest on the ungrazed AW than on adjacent grazed sites. The tallest species showed the greatest height recovery increases in ungrazed plots.

*Bouteloua* dominated perennial grass cover was about 1.5 times greater on the AW while grass-feeding grasshoppers in the subfamily Gomphocerinae were 3.7 times more abundant in 1983-984. Conversely forb feeding species were more abundant on grazed sites. (Jepson & Bock, 1989)

The EIS notes the vast vegetative shift caused by livestock especially the introduced exotic Lehmann's lovegrass (p.3.13). Bock *et al.*, (1986) report that the native grassland community of the Sonoita valley included a significantly greater variety and abundance of indigenous grasses, herbs, shrubs, grasshoppers, rodents, and birds. They noted that the impact of this exotic forage species "has been dramatic and largely negative". Although fire does knock back mesquite encroachment it does not reverse lovegrass encroachment (Bock & Bock, 1992). Although McClaran & Anable, (1992) did not find that grazing intensity correlated with spread of lovegrass, lovegrass was relatively more abundant on more heavily grazed sites on the Santa Rita Experiment Station.

Bailowitz, (1989) counted 103 species of butterflies on the AW reserve.

Strong & Bock, (1990) found that cottonwood riparian habitats in the Sonoita valley had the greatest bird species richness. Open grassland areas also has the greatest bird species richness and density in winter.

**FLPMA**

Per 43 USC 1712 (c) the proposed action (alt 2) as well as alt 4, would declare all BLM land an "area of critical environmental concern" which "means areas within the public lands where special management attention is required...to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes..." 43 USC 1702 (a)

16-21

The EIS recognizes that the planning area has "Five of the rarest habitat types in the American Southwest", habitat for listed and sensitive species, proposed wild and scenic river segments and high scenic value. In contrast to the Appleton-Whittell cow-free ACEC that already exists, however the new so-called ACEC would still be subjected to livestock grazing. This undermines the meaning and purpose of an ACEC. The purpose of ACEC designation is to emphasize natural values over extractive uses.

FLPMA requires that during Plan development the BLM must "(6) consider the relative scarcity of the values involved and the availability of alternative means ... and sites for realization of those values" as well as "(7) weigh long-term benefits to the public against short-term benefits"

16-22

The EIS does not consider "relative scarcity". The EIS does not attempt anywhere to assess and weigh the long term versus short term benefits.

By allowing grazing not merely to continue but to expand onto lands not previously open to livestock the BLM has failed to consider the "relative scarcity" of the values involved.

16-21. See response 13-4. Under FLPMA the Bureau is required to assess the planning area for the existence of Areas of Environmental Concern (ACECs). An ACEC can be any area within the planning area that requires special management. Thus it could be a hazardous materials site, habitat for an endangered species, or a unique grassland area that requires special management to properly graze the resource. The purpose is not merely to limit extractive uses.

16-22. The goals and objectives of this plan reflect the desires of the Bureau and the planning participants to identify and protect the "relative scarcity" of the natural resources and associated social values on the lands in the Las Cienegas NCA. The primary purpose of the actions developed through this planning process is to protect the identified resources and values in the short term for the long term benefit of future generations. The EIS assessed and weighed how the proposed actions, developed through this process with a full range of alternative actions, might achieve the same goals. The RMP proposes desired future conditions, resource allocations, special designations, land tenure adjustments and management actions which are crafted to conserve, protect and/or enhance the NCA's resources and values while providing for compatible levels of uses.

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15-22. (continued)

The resource that was identified as being most scarce and at highest risk of being of being lost was the healthy semi- desert grassland biome upon which the values of the group depend. The Bureau decided that the strategy most likely to protect the greatest amount of this scarce resource was an ecosystem approach which sought a coalition of those individual and groups had a desire to protect and/or use the resource. The ranching community was an obvious participant. Although livestock grazing can have adverse impacts to grasslands, we decided that properly managed grazing , if adequately monitored, could be practiced to achieve the resource objectives stated in the plan.

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These words appear nowhere in the EIS and no estimation of relative scarcity is attempted anywhere.

16-23

The EIS provides no analysis of why 42,155 federal acres, representing 86% of the total of 48956 federal acres, are considered "appropriate" for livestock grazing given the environmental protection emphasis of ACEC designation as cited above and FLPMA's multiple use definition: "the combination that will best meet the present and future needs of the American people ... without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output." (43 USC 1702(c)).

As already mentioned, beef production is not a relatively scarce value. According to the Rangeland Reform EIS 1994, all federal forage represents less than 2% of all cattle feed nationally. Therefore beef production on federal forage is irrelevant to the "present and future needs of the American people" and could easily be absorbed by slight increases in productivity by the many "alternative means ... and sites for realization" of beef production.

In contrast the rare and unique habitats in the LCNCA, habitats which are critical for recovery of threatened and endangered species are relatively scarce and have a relatively high value compared with beef production. Abundant scientific evidence and evidence presented in the EIS shows that livestock grazing is a uniformly negative impact on these habitats and on listed species they protect.

Rational consideration of this evidence in the light of statute would conclude that livestock grazing is therefore an incompatible use that should be promptly terminated on federal lands wherever practicable.

**UTILIZATION LIMITS**

16-24

Maximum forage use limits of 40% (proposed) or 60% (current) seem to make no difference to the BLM. Either level is described with the same rote formula that it will "assure that the physiological requirements of plant growth, rest and reproduction are met" (pp. 2.75, 2-101).

16-25

Neither level of forage utilization however is supported by scientific research. In a series of papers, Holechek et al. review all available studies finding that even for light grazing averaging 32% of current years growth failed to result in range condition recovery in 22% of studies. Grassland productivity was found to be dramatically higher in 30% forage use treatments compared with 40% (Holechek & Galt, 2000; Holechek et al., 1999a; Holechek et al., 1999b).

16-26

The EIS estimates extremely high consumption of 63-67% of available forage under the "adaptive" management regime of the proposed action (alt. 2) for BLM lands and actually less at 68-62% on state trust lands under the same management (p. 4.71). When compared with the estimated 41-45% under present management on Empire Cienaga this is deeply disturbing and inconsistent with the nominal forage use limit of 40% in the proposed action (p. 2.74). The EIS actually admits that forage use may be higher under the proposed than under the present action (p. 4.73).

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16-23. See 16-18 above. The EIS does present analysis showing that livestock grazing can be conducted within the designated areas and that the resource objectives can be achieved. Under some of the alternatives special grazing management is required within certain ACEC's. In some proposals grazing is excluded as an authorized use (e.g. Nogales Spring ACEC). All such decisions are based upon the needs of the specific resource being protected, and what special management is considered necessary to protect the values of the ACEC being addressed.

As stated above, our analysis has shown that livestock grazing can be properly conducted within the planning area and that the resource objectives can be achieved. Monitoring studies conducted by the BLM during the past decade have shown that while grazing was authorized, improvement occurred among certain endangered species populations and other wildlife populations, and also in wildlife habitats. Therefore, we conclude that livestock grazing is not incompatible with the protection and enhancement of resources within the planning area.

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### Letter 16, page 15 (continued)

- 16-24. The utilization limit is an important component of the livestock grazing management strategy in the preferred alternative (Alternative 2). In fact, it has been changed from the 40-60% limit under current management (Alternative 1) in the Interim Grazing Management Plan to the 30-40% limit in this RMP. We made this change because our research has shown that grazing objectives are more likely to be achieved under a lower use limit.
- 16-25. The change in the use limit was based on research presented by Holechek, Rex, and Carlton in 1999. Refer to the References Section in the Draft Land Use Plan. Your statement that findings in Holechek, et.al. showed a 22 % failure in range recovery condition can be interpreted to mean that there was a 78% success rate.
- 16-26. The relationship of vegetation production, forage allocation, and animal utilization is a very complicated subject and the numbers and terminology can be confusing to readers. The tables on page 4-71 all refer to Alternative 2. To correctly understand these data, compare Table 2-13 on page 2-74 (Alternative 1), Table 2-24 on page 2-104 (Alternative 2), and Table 2-29 on page 2-122 (Alternative 3). The final column indicates the percentage of the allocated forage that is consumed under that alternative at that alternative's use limit (50% in Alternative 1, 35% in Alternative 2, and 35% in Alternative 3). The point being made is that the worse the year is, the greater the percentage of the allocated forage that is consumed if the stocking rate is not varied. This continues until the production is so low that the forage allocated is not enough for the livestock authorized, the allocated forage is completely consumed, and the cattle start eating the portion of the production that was reserved for such things as watershed protection, wildlife forage, and wildlife cover. In a good year vegetation is under allocated and too much forage remains standing, while in a bad year almost no vegetation remains standing unless the animals are forced to be removed. If the stocking rate is adjusted annually (Alternative 2) for the change in vegetation production, the percentage of the forage consumed should remain just under the level of forage allocated. In good years the allocated forage is not left uneaten, and in the bad years there is a still abundant vegetation remaining for the other uses.

Refer to responses 2- 2 and 2-3 for an explanation of the differences in the columns in the tables. Only 50% of the vegetation production is considered in the forage allocation. To calculate the amount of forage allocated, subtract 50% of the total production and multiply it by the use limit. Figures in the last column show the percentage of the allocated forage that is actually consumed.

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16-27 Which is the real forage use limit- 67% or 40%? Best available science and regulatory requirements suggest that proposed stocking rates would have to be cut by about 50% to reach appropriate levels of forage use.

16-28 The extreme level of forage and cover destruction proposed will have profoundly negative impacts on Mearns quail, pronghorn, deer, groundnesting and grassland dependent birds, rodents, insects and reptiles. The EIS notes that pronghorn and mule deer are declining but proposes to do nothing about it, bewailing the sorry state of affairs while continuing to allow cows to destroy their habitat and preclude recovery as science cited earlier shows (p. 4.73).

The EIS conveys the false impression that under alt 2 stocking rates can be adjusted on both BLM and State lands to deal with drought, whereas under alt 4, with BLM lands closed to grazing, the BLM is no longer capable of adjusting stocking rates to deal with drought. This is projected to result in 100% use of available forage in unfavorable years and continue to degrade the watershed (p. 2-131, 4.20).

16-29 The fact is that the BLM holds the State land leases for the bulk of state lands in the planning area (Empire Cienaga and Empirita) and subleases them to ranchers. Therefore under both scenarios the BLM is equally capable of dictating the appropriate stocking rate to sublessees. Why would it be less capable of controlling the stocking rate on its state lands leases to cope with unfavorable years under alternative 2 than alternative 4? If the sublessees are uncooperative, the BLM can turn the sublease over to another party in either case. This inconsistency appears to be another "red herring" to make the no-grazing alternative look bad compared with the proposed action.

**MONITORING**

16-30 The BLM has already neglected monitoring these allotments. Unfenced BLM lands not allocated to cows on the Empirita and Empire Mtns could be receiving heavy grazing use, but we are not to know as apparently grazing is not monitored there. The current utilization limits on Empire Cienaga of "40-60%" which we take to mean "60%" are not monitored (p. 4-5). How can the public therefore be asked to believe that the BLM will do any better with the elaborate monitoring plan proposed?

**RESIDUAL COVER**

16-31 Pronghorn antelope fawning, and grassland sparrow areas require cover but there is no guarantee this is possible at proposed levels of stocking.

16-32 The EIS states that three species of quail are found on the NCA. Research has shown that a minimum 6 inch stubble height must be maintained to allow quail to prosper (Brown 1982).

**RIPARIAN**

16-33 Riparian condition in the planning area has been dismal. Virtually no riparian was in proper Functioning Condition in 1993. Cienaga Ck and Empire Gulch have improved to 67 and 39% PFC largely as a result of livestock exclusion, but other areas not excluded have not (pp. 3.24-26).

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16-27. The limit is 40-60% in Alternative 1, and 30-40% in Alternatives 2 and 3.

16-28. It must be acknowledged that current levels of livestock grazing have often exceeded that compatible with maintaining optimum conditions for pronghorn, Mearns' quail, Baird's sparrow, bunchgrass lizard and other sensitive species. This would probably continue if Alternative 1 (No Action) were implemented. However Alternative 2 would implement an upper limit of 40% utilization which, if rigorously adhered to, will tend to maintain more suitable habitat condition for species requiring healthy stands of native grass cover. Under Alternative 2 the biological planning process would include more intensive monitoring of wildlife habitat conditions. This monitoring effort, if adequately funded, would provide feedback to the biological planning team members, who would use the information to determine whether the implemented stocking rate is correct or in need of modification. Admittedly, several cycles of stocking, monitoring, and adjustment would be required before livestock stocking rates could meet wildlife habitat needs.

Alternative 3 would operate in a manner similar to Alternative 2, except that BLM would not include

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### Letter 16, page 16 (continued)

16-28. (continued)

input from a biological planning team. Monitoring to determine whether BLM was meeting standards and guidelines relative to wildlife habitats and species would be implemented. Adjustments to meet these guidelines will be implemented as needed until the needs of sensitive wildlife were met.

Alternative 4 would achieve resource objectives identified on pages 2-5 through 2-10 for watershed, vegetation, riparian habitat, aquatic habitat and wildlife/fisheries on public land more rapidly than the other alternatives.

16-29. Agencies usually set an upward limit as the allowable stocking rate on a lease or permit. Generally the rancher is allowed to voluntarily reduce that number during times of drought. However, if the stocking rate is wrong or the rancher does not want to voluntarily reduce numbers, the agency must force a reduction. The rancher may choose to utilize appeal rights which are included in the forced reduction process. Under Alternative 2 the rancher would agree to abide by the recommendation of the Biological Planning Team (or RRT). To date, the Donaldsons are the only lessees who have made the commitment to the Biological Planning Process. The others are choosing on their own the numbers of livestock that they graze on their allotments up to their allowable stocking rate. Because the Bureau currently holds the grazing lease for the State Trust lands on the Empirita and the Empire-Cienega Ranch the agency can exert a certain amount of influence on the lessees of those ranches. We assume that under Alternative 4, if the BLM was not allowing livestock to graze on federal public lands under its administration, that the grazing leases for State Trust lands would be sold, giving the current lessees the first right of refusal. Then, no longer a party in the state lease agreements, the BLM would not have a voice in determination of stocking rates. In this scenario, we assume that the ranchers would stock as many animals as they wished on private lands and up to their allowable stocking rate on State Trust lands.

As stated in 16-4 above, the Bureau leases the State Trust lands in the Empire-Cienega and the Empirita Ranches.

However, other than being able to vary the numbers of animals grazing on those leased allotments annually, the BLM does not have any authority to make decisions regarding state-owned land. If the BLM closed the federal public lands on these ranches to livestock grazing, would there be any point in its continuing to lease the state lands? We do not know whether the Arizona State Land Department would allow the Bureau to continue holding the grazing leases, much less give us the authority to approve or deny a sublease proposal. The Bureau might be able to continue doing this under Alternative 4, but we doubt Congress would authorize the Bureau to manage these State Trust lands for grazing when we are not grazing our own lands. There is much speculation in this scenario.



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### Letter 16, page 16 (continued)

- 16-30. Currently on the Empirita, fences do not separate federal and state lands. But, these lands are being managed under a cooperative management plan with the National Resource Conservation Service (NRCS) and the Arizona State Land Department. Several range improvements are needed before implementation of the full livestock numbers and the rotational system. Therefore the Parsons, who are the grazing allotment lessees, have only been running 60 to 100 cattle for the last decade on a permit with an upward limit of 337 cattle. There has been little utilization and the trend is upward.

The public lands in the Empire Mountains have not been grazed since BLM issued trespass notices in 1997, and there is only one section of State Trust land being authorized for grazing use. Although we have not completed an ecological site inventory, most of the lands in 1997 were in good condition, except those immediately adjacent to the two water sources.

Although utilization monitoring has not been conducted on the four allotments in the planning area since acquired by the BLM in 1988, the agency has been monitoring other resources since that time. On the Empire-Cienega and Empirita allotments, Ecological Site Inventories have been completed in the uplands and 32 permanent monitoring sites were established where data has been collected to provide information about changes in vegetation condition. Aquatic and fisheries studies have been established and continue to provide information collected on an annual basis. Several types of riparian studies are in place. Many types of avian studies have been completed, and bat studies have been initiated. Waters have been inventoried, test wells monitored, and the watershed modeled by the University of Arizona. Overall this piece of land has been heavily studied and monitored. There is general agreement that the property is in good condition and is showing continued improvement. Once this plan has been completed and the proposed staff hired and put into place, additional monitoring on a more regular basis will be conducted.

- 16-31. There is no absolute guarantee that adequate grass cover will be present. However Alternative 2 establishes an upper utilization limit of 40% (moderate) for key grass species which may, if applied rigorously, allow for maintenance of adequate grass canopy cover for pronghorn fawns and grassland sparrows (except for areas within one-quarter mile of livestock watering facilities). In addition, the biological planning process, described in Alternative 2, permits adjustment of stocking levels to achieve an adequate amount of cover for wildlife species. Several cycles of grazing, monitoring and adjustment may be necessary before a stocking level is achieved that simultaneously meets the habitat requirements of sensitive wildlife species.

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### Letter 16, page 16 (continued)

- 16-32. Although “R. Brown is referenced in the text of the CBD’s letter, we did not find this author listed in the attached bibliography. We assume that reference is being made to Brown R., 1982. *Effects of Livestock Grazing on Meran’s Quail in Southeastern Arizona*. Journal of Range Management Vol. 35. No. 6 p. 727 - 732. This paper states that livestock utilization of 46% to 50% results in marginal habitat conditions for Mearn’s quail. Hence the utilization limits of 40% to 60% described in Alternative 1 will probably result in sub-optimal grass cover for Mearn’s quail. This also suggests that the 30% to 40% utilization limit, described in Alternative 2, will probably result in acceptable habitat conditions for the species, except for those areas within one quarter mile of livestock watering facilities. In addition, the biological planning process will allow for stocking rate adjustments to provide for the needs of sensitive wildlife species, so long as timely monitoring is conducted. BLM is currently coordinating with the Arizona Game & Fish Department in the use of a visibility obstruction board to assess quail habitat conditions. If this technique proves useful it will be incorporated into the monitoring program, in addition to monitoring now proposed for wildlife species and habitat.
- 16-33. Since establishing the exclosures the need for livestock grazing within the riparian zone has not developed, but we want to leave the possibility open if the need does arise. Grazing might be used to reduce the fuel load and prevent large wildfires in the riparian zone, or to open up some of the cienegas to create more open water for the waterfowl or fish.

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	<p>There is no guarantee that even the miniscule riparian enclosures proposed on Cienega Creek will not still be grazed by cattle. There is a gaping trapdoor in the management description allowing "grazing use in riparian pastures and enclosures only to meet resource objectives" (EIS p.2-43). In the light of the overwhelming evidence showing that livestock degrade riparian habitat, what possible "resource objective" could require grazing?</p>
16-34	<p>The EIS admits that livestock crossings on Cienega Ck damages riparian habitat, banks and water quality (p.4-48) but the proposal is to increase not reduce the number of crossings.</p>
16-35	<p>Equally disturbing is that the proposed action would allow the cattle to stay in the stream "crossing" lanes for up to 21 continuous days. This is excessively long time for a herd of cows to cross a stream. This would allow extensive riparian grazing far beyond the purpose of a real "crossing".</p>
16-36	<p>Cinco Ponds would be still grazed during the summer, resulting in probable take of Chichahua leopard frog and other species of concern (p. 4.48). A riparian habitat assessment conducted in 2000 found that 33% of Cienega Creek and 61% of Empire Gulch still had not achieved proper functioning condition.</p>
16-37	<p>The EIS misrepresents upland impacts on wetland riparian by claiming that they would diminish (p. 4.43). How is this possible if forage utilization and area grazed are proposed to increase?</p>
	<p><b>WATERSHED</b></p>
16-38	<p>The no grazing alternative is expected to have significant benefits in riparian recovery and restoration of normal watershed function (p. 4.45). The EIS undercuts this gain by a spurious argument that degradation could worsen on adjacent state lands, as already dealt with above.</p>
	<p>There has been no improvement in the watershed condition since 1974. In fact bare ground has increased to 28 from 17% while vegetative cover is only about 50% and static (p. 3.5).</p>
16-39	<p>In a site inspection by CBD staff in Oct 2001, very little grass cover was found throughout the pasture from the western entrance to ranch headquarters. There was a predominant cover of annuals such as <i>Macarantheuraz</i>. Taking the south road we found evidence of erosion and severe overgrazing and hedging of sacaton.</p>
	<p>CBD comments on Las Cienegas RMP/EIS page 17 of 31</p>

- 16-34. See response 2-5. Impacts associated with using crossing lanes along the creek do exist, but have been short term and localized. The Bureau and the grazing lessees continue to search for ways to further reduce impacts. As previously noted, we are proposing two fewer crossing lanes along Cienega Creek and plan to reduce adverse impacts by using gravel and rock to harden two of the crossings. The entire creek has now been fenced on both sides, and once alternate waters can be developed, the need for watering in the creek will be eliminated. We believe these actions and decisions represent considerable progress.
- 16-35. See response 2-6. The Bureau and the grazing lessee have been reducing the level of cattle use in the riparian zone. But, while the cows are nursing their calves prior to weaning, they must be "paired up" during the stream crossings to prevent the calves from being separated from their mothers. With the large herd, groups of cows and calves are gathered and brought up to the crossings where they can pair up. Although the cattle are not in the riparian zone for the full 21 days, the process of rounding up the groups and bringing them up to the crossings, pairing up, and then crossing, may take up to three weeks. The time actually spent in the water is much less than three weeks. We consulted about this process with the U. S. Fish and Wildlife Service for the interim grazing plan. Based upon this consultation, steps for monitoring and mitigating impacts to endangered species were developed and implemented and have been incorporated into the proposed action in this RMP.

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- 16-36. See response 2-8. Cienega Creek continues to progress in ecological condition. Some segments have reached PFC and are on their way to reaching their geomorphic and vegetative potential. The segments that are functional at risk are nearing PFC including the reach next to the agricultural fields adjacent to the Cienega Ranch. This reach was part of a restoration project that removed dams and reconnected the flood flows from the larger watershed to the historic channel. This has led to more recruitment of riparian vegetation and increased duration of base flows. This reach was dominated by senescing old trees that were not being replaced by young trees. Empire Gulch remains in the functional at risk category due to a head cut that may migrate upstream with large flood events in the future. This headcut was present prior to acquisition of these lands by BLM in 1988.
- 16-37. Under Alternative 2 the impacts to the upland watershed would diminish with implementation of the management actions. The intensive monitoring of the health of the upland resources and the associated Biological Planning Process would detect the need and adjust livestock numbers in time to avoid adverse impacts to upland ecological sites during times when the soils and vegetation are stressed and subject to damage (drought, wildfire, insect invasions, etc.). Reducing the adverse impacts to upland ecological sites would improve the upland watershed condition, resulting in increased infiltration of precipitation into the soil and decreased runoff, sediment transport, and soil erosion. The corresponding decrease in peak flows would reduce damage during flood events and improve wetland riparian sites.

Because the utilization limit remains constant at 30 to 40% of the current years production, the total quantity of forage consumed and the area grazed may increase, but the percentage of vegetation cover is not reduced. Adequate vegetation would remain to protect the soils and to assure the physiological needs of the plants. Alternative 2 provides for variable stocking rates on public lands in the planning area, based on assessment of intensive monitoring data. Livestock numbers could be increased in times of abundant vegetation production and would be reduced in years of unfavorable precipitation. The existing utilization limit (the percentage of the above ground portion of the plant harvested by livestock) would be reduced from 40-60% to 30-40%. This would tend to increase the amount of cover for watershed protection on areas being grazed.

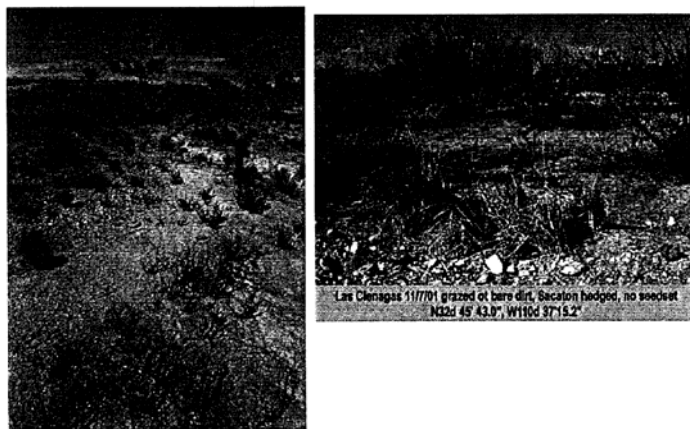
- 16-38. The watershed condition within most of the planning area has not been assessed quantitatively. While the data referred to on page 3.5 of the Draft plan shows the watershed condition as being in satisfactory condition from 1974 to 1999, the trend (as measured by the amount of bare ground) was downward for the period 1995 through 1997. This is probably true. The last half of the 1990's was a period of very low rainfall during the summer growing season. The low vegetation production is reflected in these numbers through the lack of soil cover by live plants and litter in the 1995 and 1997 data sets. We did have a favorable year in 2001, and data collected in cooperation with the University of Arizona and the NRCS in October 2001 on 8 of the 29 permanent monitoring sites on the Empire Ranch (bare ground = 22%) may indicate an upward trend starting in 1999 (28% vs 33% in 1997) through 2001. Intensive monitoring of the resources proposed in Alternative 2 of the plan would help the Bureau to improve our assessment of watershed conditions.

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Letter 16, Page 17 (continued)

- 16-39. We know about the areas and times mentioned in your letter and they have been addressed through the Biological planning process. Some of the problems were caused by prolonged drought. Drought and management problems combined last year to cause overuse at the south end of the ranch. The management problems are being corrected.

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16-40 Stock tanks are recognized as likely to cause harm to watershed condition under alt 1 (p. 4.5, 4.19), but this impact is ignored in the discussion under alt 2 which also involves new stock tank construction. (p. 2.78). The proposed opening of a new allotment in the Empire

16-41 Mtns threatens to degrade the watershed of Cienega Ck (p. 4.13).

**WATER QUALITY**

16-42 In the early 1990s upper Cienega Ck had impaired water quality due to coliform, strep, ammonia and sulfides undoubtedly due to livestock which are known from much other research to be major source of water quality impairment (p. 3.8) (Nader *et al.*, 1998 as see above). The proposed action would do little to improve water quality (p. 4.26). In fact by increasing forage use and expanding the grazed area in the Cienega Ck watershed, water quality may actually decline.

**T&E SPECIES**

16-43 The EIS admits that impacts to aquatic species would be slightly worse than at present by allowing more livestock crossing through Cienega Ck. (p. 4.52). Gila topminnow numbers despite current partially excluded and recovering creek, are static (p. 3.37), Gila Chub remain rare and static in number. Chiricahua leopard frog number continue to decline. Jaguar could potentially use Cienega Ck as a corridor.

16-44 Upland species like Lesser Long Nosed bat would still face cattle devastation of their agave foodplants because no plan is put forward to restrict cattle entry to periods outside the agave bolting season (p. 4.72). On our recent inspection high rates of flowering stalk

16-40. As further stated on page 4.5 the area which is currently adversely affected by the existing stock tanks is localized, small scale, and use of these waters by cattle is seasonal. Under the proposed grazing management in Alternative 2, only a few new stock tanks are proposed and these would primarily be constructed to replace the current watering areas in Cienega Creek and Empire Gulch. Also under the proposed management, cattle would only use an individual water for a period of 4 to 6 weeks in any one year.

16-41. See response 2-9.

16-42. Water quality parameters such as fecal coliform, strep and ammonia are a result of direct contact with surface water and livestock. In adjacent areas to the creek, urine and fecal matter are deposited on dry land where the ammonia enters the nutrient cycle directly through microbial and plant uptake. The coliform and Streptococcus bacteria die as dehydration progresses (EPA 1993). Sulphur in the form of hydrogen sulphide resides in the stream bed and bank soils as a natural byproduct of anaerobic decomposition. When these soils are disturbed, the hydrogen sulphide gas is liberated in the form of bubbles and diffuses into the water column.

## *Chapter 6: Public Comments and Responses*

### Letter 16, Page 18 (continued)

16-42. (continued)

Because livestock have progressively been excluded from the surface waters of Cienega Creek and its tributaries over the last 13 years, inputs of fecal microbes and ammonia are likely to have diminished significantly. This impact occurs for short periods in crossing lanes when they are being used. Hydrogen sulphide does build up in soils during periods of rest from use in these areas and is released when disturbed. The Department of Environmental Quality water quality monitoring for the years 1992, 1993, 1998, 2000 and 2001 showed no exceedence of state water quality standards for any of the parameters mesured (Lin Lawson, pers. Comm, 2002).

16-43. It is unclear what your statement is trying to imply. Gila chub numbers decreased drastically in 1999 due to disease (external fungal infection). Until this event, Gila chub were generally abundant (common) in reaches with pool habitats. The disease epidemic in the chub population is unlikely to be either directly or indirectly related to the presence of livestock in the area. The trend in this species is very subjective as it reflects fish captured while seining for Gila topminnow. Adult chub are infrequently caught while juveniles are more susceptible to seining in pool habitats. Trend data for Gila topminnow and longfin dace is much more reliable than for chub. Fish surveys using electrofishing gear have not been a regular part of annual monitoring efforts. Leopard frogs and tadpoles are rarely encountered inside or outside of grazing exclosures. The reason(s) for their decline at Cienega Creek are unknown (Dr. Phil Rosen Univ. of AZ herpetologist). The riparian area is being used now by mountain lions which would suggest that jaguar may find prey and shelter adequate as well. See also Chapter 3: Affected Environment, Special Status Species section.

16-44. Some livestock graze during the season when agave are producing flower stalks and a portion of these stalks will be eaten by livestock. On the Empire/Cienega allotment attempts have been made, with some measure of success, to keep the bulk of the mother cow herd in sacaton pastures, away from agave stands during the bolt period. At present there is no clear consensus among researchers as to the impact of ungulates on agave flowering success and lesser long-nosed bat. Cattle, horses, pronghorn, deer, and javelina are known to feed on agave stalks in their early stage. Monitoring the impacts to agave stalks from cattle grazing will continue as will adhering rigorously to moderate utilization limits (40% on key species), as proposed in Alternative 2.

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destruction were observed for agaves in the uplands to the west of south road (EC900) north of the highway junction. At the high proposed utilization rates of up to 67% of available forage there is likely to be significant losses of the prey base for Aplomado Falcon and other sensitive or listed raptors.

16-45 The EIS admits that "Under alternative 2 the likelihood of achieving the wildlife objectives would still be doubtful" (p. 4.75), while "the removal of livestock from public lands and the elimination of grazing conflicts might allow for more successful recovery and reestablishment of species" (p. 4.82)

Then why on earth is this dismal scenario alt 2, the proposed action?

16-46 How is alt 2 supposed to be consistent with the ACEC and "Conservation" designation of the NCA and the ESA's prescription to work toward recovery of listed species? Apart from narrow strips of riparian subjected to 21 days of cows in 8 livestock crossings, the rest of the entire basin will be as cow-damaged as it has been in the past, if not more so, under the proposed action.

*SW Willow Flycatcher (SWWF)*

16-47 The birdlist for the NCA shows not surprisingly that birds favored by livestock presence like meadowlarks and parasitic cowbirds are "common" while birds negatively impacted by grazing and by cowbird parasitism like the Southwestern Willow Flycatcher and Bell's vireo are rare or uncommon.

16-48 Despite this evidence, cattle would still not be excluded from SWWF habitat during the breeding season. Cattle would be allowed to wander around these 6 existing and 2 new proposed "crossing" areas during breeding season of Apr- Sept (p. 2.107) in violation of the 5 mile limit for occupied habitat, which is watered down in this EIS to encompass only "livestock management facilities" (p. 2.107). The proposed action would place stock tanks less than 5miles from riparian areas providing potential reservoirs for weeds and aquatic pests, while also attracting cattle and cowbirds (p. 4.49).

Non breeding SWWF have been found along Cienaga creek but none have been detected in surveys since 1993 although riparian habitat is suitable. A likely cause stopping the establishment of a breeding population is the cowbird population. It is cows that attract cowbirds, not only "livestock management facilities" No cows on federal lands should be within 5 miles of a nesting flycatcher or suitable habitat without a cowbird trapping scheme.

*ARCHEOLOGICAL RESOURCES*

16-49 Ongoing grazing significantly impacts archeological resources as research shows (Osborn et al., 1987). The proposed action is to build enclosures around sites as they are identified. A better approach not identified in the EIS is to first identify all sites and decide whether any livestock grazing is consistent with their protection in the light of available science.

*RECREATION*

The EIS admits the conflict between grazing and recreational demand, indicating that recreation may increase if grazing were ended on BLM lands (p. 4.109). However recreation

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- 16-45. Achieving the resource objectives identified on pages 2-5 through 2-10 for watershed, vegetation, riparian habitat, aquatic habitat and wildlife/fisheries on public land will be faster under Alternative 4 than under the other alternatives. However, if adequate monitoring is conducted to identify and rectify conflicts between wildlife/fisheries requirements and other uses, and if the biological planning team makes adjustments in use levels to alleviate these conflicts, as proposed under Alternative 2, then some wildlife/fisheries objectives will be achieved more rapidly.
- 16-46. The designation of the Las Cienegas NCA and the proposed ACEC designations are made to protect the sensitive resources and associated values located around Sonoita. The combination of allowable uses administered under the special management prescriptions developed in the proposed action and ACEC proposals was assessed in the EIS and was determined to be the alternative best suited to achieve the goals and objectives developed through the Bureau's Land Use Planning Process. While adverse impacts of livestock and other allowable uses were identified, adequate use supervision, monitoring, and plan revision are provided in the plan to mitigate the impacts. An example is the need to provide areas of nonuse along the riparian corridors (as well as other constraints in the ACEC prescriptions).



## *Chapter 6: Public Comments and Responses*

### Letter 16, Page 19 (continued)

16-46. (continued)

The plan also provides proposals for reintroduction of threatened and endangered species and other actions to support recovery efforts for listed species, control of exotic plant species, and vegetation treatments designed to protect and restore natural ecosystem components and processes that have been disrupted through some of the past management practices. Under Alternative 2 an upper limit of 40% for key species is proposed. If this use limit is rigorously adhered to then upland areas and riparian habitats may recover from past heavy utilization and provide sufficient cover for sensitive wildlife species in most areas. However it may take several cycles of stocking, monitoring, and adjustment to resolve many major conflicts between wildlife/fisheries and other uses.

16-47. It is true that avian generalists such as meadow larks and cowbirds outnumber rarer riparian specialists such as Bell's Vireo, Southwestern willow flycatcher, western wood peewee, etc. in the region as a whole as well as the NCA.

16-48. Recently an active willow flycatcher nest territory was located on Cienega Creek. More intensive monitoring of Southwestern willow flycatcher nesting success, cowbird populations, and parasitism rates will be necessary. Additional management actions may also be necessary to reduce conflict between livestock and riparian obligate species such willow flycatcher and Bell's Vireo.

16-49. Osborn, et al., states that livestock can impact archaeological sites, a fact recognized by the BLM for many years. This is the reason that a large number of the planning area's cultural sites are already located within fenced enclosures, where they are not being disturbed by livestock, and why provisions for constructing enclosures in the future are being made. Currently, Class I cultural resource inventories are required, and are being conducted, before renewal of all grazing allotments within the planning area. Class III cultural resource inventories are being conducted prior to permitting any activities which might cause impacts to cultural resources, such as construction of fences, watering tanks and other allotment improvements. Additionally, this EIS requires developing and implementing a monitoring/protection plan for the cultural resources located in the NCA. The Arizona State Historic Preservation Officer (SHPO) has reviewed this EIS and concurs with the cultural resource management process proposed in Alternative 2 (See 5-1).

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16-50	<p>requires management to avoid any adverse impacts that might arise as a result. Converting many of the roads into trails and siting all facilities away from wildlife conflict areas would achieve this goal. Equestrian demand is already a very small component of use and would only increase if the BLM encouraged it. The solution is not to encourage it by removing livestock facilities from areas closed to livestock, under alt 4 or the restoration alternative presented above. The EIS reads as if this were out of the BLM's hands (p. 4.109).</p>
<p><b>SOCIAL IMPACT</b></p>	
16-51	<p>Poor consideration is given in the EIS to the "lifestyle and culture" interests of the numerous picnickers, day trippers, hikers, hunters, fishers, and professional or amateur mycologists, ornithologists, entomologists, herpetologists, botanists, mammalogists and other zoologists, wilderness lovers and bird watchers that frequent and enjoy the biodiversity and landscape of the NCA, including many of the Center's 6000+ members. The public interest in the NCA goes well beyond just the interest in recreation encompassing interest in threatened and endangered species, game and ecological integrity at the landscape level.</p>
<p><b>ECONOMIC ANALYSIS</b></p>	
<p>No cost benefit analysis is done to see if net public benefit would exceed cost for the alternatives. The EIS details the projected loss to permittee, the minor loss of the grazing fees and cost of fencing under alt 4, but does not do an equivalent calculation of the fiscal and intangible benefits that would flow from ending grazing on public lands.</p>	
<p>There was no consideration of the economic benefits of ending grazing for the local and regional economies that could result from recovery of wildlife and vegetation at a scale approaching the whole ecosystem, enhancing recreational, fishing and hunting resources, and cessation of ongoing costs to the taxpayer of litigation and complex grazing management schemes. Instead every opportunity is taken throughout the EIS to paint the no grazing alternative as a disaster resulting in increased degradation on State Lands and rampant subdivision.</p>	
16-52	<p>Studies such as that of Souder (1997) were not done or referenced. Souder's study found that dispersed recreation and hunting brought in 167 times more revenue to local and regional economies than did public lands ranching on the western side of the Kaibab Plateau. His data also suggested that there was unsatisfied demand for those services which was inhibited by ranching.</p>
<p>In considering costs to the public, no consideration was given to predator control; direct payments, tax breaks and subsidies to ranchers; total federal costs for surveys, analysis, planning and implementation; federally funded range research and extension services.</p>	
<p>It is assumed without evidence that loss of the permit would be economically devastating for the permittee. In fact the Federal government has a plethora of rural development grants which economically disadvantaged people in rural areas have access to. The BLM should be helping rural communities escape dependence on dying industries by tapping into these funding sources. There is good reason to expect that a permittee could benefit economically by leaving the unprofitable ranching industry and seeking other means of income with such assistance grants.</p>	

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16-50. Equestrian demand may increase if BLM encourages horse back riding from a state or national level. The intent of this plan is not to promote any use that exceeds desired conditions set forth in this document.

16-51. See response 1-3. The Recreation Management Information System (RIMS) list, which acknowledges nature study as a valid recreation use, was added to Appendix 2. To facilitate simplicity throughout the planning process, we listed only major recreation activities that would occur, such as hiking. It would be unreasonable to specifically list every activity associated with the "lifestyle and cultural interests" of each individual who visits the NCA to study plants, birds, wildlife and reptiles, or "day trip," picnic, hike and hunt. We realize that everyone has their own reasons and benefits for visiting public lands. However, people who enjoy nature study and research may also unknowingly contribute to negative, cumulative impacts in degrees more or less than any other recreation users. Subtle impacts such as trampling vegetation, and disturbing wildlife lead to cumulative impacts. Our goal is to encourage in-depth knowledge and use of Leave No Trace land use ethics as a standard and enduring component of the management of recreation use.

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16-52. The level of economic analysis in the FEIS is consistent with the types of issues being addressed and the decisions to be made in the RMP. Rather than being driven by an economic analysis, instead it is imperative that we approach our planning efforts from a resource based perspective. The planning decisions described in the various alternatives are developed by analyzing the impacts of various uses on the natural and cultural resources within the planning boundary. The alternatives described in the plan will allow for the continuation of actions, such as grazing and recreation, in a manner that does not have a significant impact on the natural and cultural resources and which complies with our obligations under the endangered species act.

In most cases the role of BLM in determining use allocations and analyzing various multiple use applications is to determine if the action is allowable according to the various laws, regulations, and policy. Usually this is done through an environmental analysis as authorized by the National Environmental Policy Act. We do incorporate some economic analysis into our decisions to determine whether the Bureau's actions will or will not negatively impact that portion of the population that has low income. Many factors influence the economic viability of various multiple use actions including grazing, recreation, rights of ways, etc., however over emphasis on an economic criteria to determine what is in the best interest of the public could potentially lead to various user groups competing against each other for control of strategic areas and result in degradation of resources. It is imperative that we approach our planning efforts from a resource based perspective. The planning decisions described in the various alternatives are developed by analyzing the impacts of various uses on the natural and cultural resources within the planning boundary. The alternatives described in the plan will allow for the continuation of actions, such as grazing and recreation, in a manner that does not have a significant impact on the natural and cultural resources and comply with our obligations under the endangered species act.

In most cases the role of BLM in determining use allocations and analyzing various multiple use applications is to determine if the action is allowable, according to the various laws, regulations, and policy, usually this is done through an environmental analysis as authorized by the National Environmental Policy Act. We do incorporate some economic analysis into our decisions to determine whether the Bureau's actions will or will not negatively impact that portion of the population that has low income. Many factors influence the economic viability of various multiple use actions including grazing, recreation, rights of ways, etc., however over emphasis on an economic criteria to determine what is in the best interest of the public could potentially lead to various user groups competing against each other for control of strategic areas and result in degradation of resources.

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16-53	<p>No discussion of tax revenues to the County is done. If permittees continued to run livestock, despite losing the permit, property taxes paid to the County would remain unchanged. However, if permittees decided to leave the livestock business, much higher property tax rates would have to be paid to the County because of the state tax structures that tax livestock operations at 20 to 100 times less than conservation or other uses of land. Therefore there is potential for increased tax base for the County if livestock grazing were ended not only on the allotment but also on the base property. This possibility should have been considered in the economic analysis.</p>
16-54	<p>The estimation of \$550,000 dollars for fencing under alt 4 is a result of the unreasonable construction of this alternative. Minor additions to existing fencing could exclude most of the BLM lands from livestock and still leave state lands open to grazing. Since the BLM holds state lands leases on the Empire, Cienaga and Empirita allotments, the BLM could still control grazing management there is much the same way as detailed in alt 2, indeed hopefully better than the plan as described by reducing allowable forage use to 30% or less.</p>
<p><b>ROADS</b></p>	
16-55	<p>The enabling Act required that "provisions designed to ensure that if a road or trail located on public lands within the Conservation Area, or any portion of such a road or trail, is removed, consideration shall be given to providing similar alternative access to the portion of the Conservation Area serviced by such removed road or trail." (6(b)(10)) Hiking trails closed to motorized vehicles would still provide "alternative access" to a roadway. There would also have to be identification of the portions of the NCA "serviced" by roads that are removed so as to know how to provide alternative access.</p> <p>Wild and Scenic Rivers Act sect 2(b) defines:</p> <p>"(1) Wild river areas -- Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.</p> <p>(2) Scenic river areas -- Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads."</p>
16-56	<p>For Cienaga Ck to be protected for this purpose, more road closures will have to take place. The road closures proposed are minimal, in every alternative, and leave a tangle of roadways especially along Cienaga Creek. Many roads that are of questionable utility for access as they duplicate access that already exists to the same end points. Alt. 2 actually proposes to create a new route that clearly duplicates an existing route to the same destination.</p>
16-57	<p>An alternative road system for the Planning Area would provide well-distributed motorized access to all parts of the Area, while reducing roads near Cienaga Creek to just a few crossings. 60-70% of roads should be closed or reduced to non-motorized access trails. This would be consistent with the enabling Act's requirement to maintain "alternative" access.</p>

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- 16-53. An economic analysis of the foreseeable tax revenues can only be analyzed in the most general terms and a number of scenarios would have to be generated. The tax revenues for the county could decrease or increase depending upon the development of private and state lands or acquisition of additional lands by BLM.
- 16-54. Estimates of fencing costs are only general statements because the final configuration of fences, future construction costs and methods are unknown. Text regarding fencing of public lands under Alternative 4 has been modified in Chapters 2 and 4 to note the variety of fencing options possible.
- 16-55. In the preferred alternative there are seven road segments that are to be closed to motorized vehicles and opened to non-motorized travel year-round see map 2-6.
- 16-56. Many hours of discussion about roads took place during the SVPP meetings. Ample opportunity was provided for input and modifications regarding the transportation system. In the Preferred Alternative, SVPP recommended closure and rehabilitation of about twenty road segments that vary in length from several hundred feet to some more than one mile-long. Not only will these segments be closed to motorized travel, but to ensure that rehabilitation is successful any repetitive use will be discouraged.

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16-56. (continued)

Refer to m Map 2-6 for an overview. The purpose of some of the new road proposals is to reduce impacts. Road closure proposals would only apply to BLM administered lands. Route designation for roads across intermixed State lands are shown as recommendations only, and would be designations that BLM would apply if the Bureau acquired the parcels.

16-57. The roads to be closed under Alternative 4 would be rehabilitated or restored and not managed for alternative non-motorized access. Dispersed hiking or horseback use would be allowed in the area, but to achieve successful rehabilitation of old road beds, the BLM would discourage their use. Use of non-motorized routes in other areas would be encouraged rather than cross country travel in the areas where rehabilitation is to occur. This would be consistent with the enabling Act's requirement to maintain "alternative" access.

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The EIS documents (p. 3-57) that the over 90% of visits are for low impact recreation or touring and sightseeing on the main roads. Four wheel ATV and motorbike users amount to a tiny 4% of users and there is no major demand for the huge network of roads that presently exists.

**UTILITY CORRIDORS**

The proposed conversion of existing power and gas corridors into "double-wide" corridors subverts the underlying purpose of the NCA. The land acquisitions and NCA designation were originally intended to forestall urbanization of the Sonoita Valley.

16-58

Safe population size using the Sonoita Basin aquifer is estimated in the EIS to be 2767 people, while predicted population would exceed this by threefold (p. 3.7). By allowing expanded utility access for services into the Sonoita area, the proposed action will be facilitating urban development and ultimately the drying out of Cienaga Ck.

Allowing more utility development will entail new roads and heavy equipment access, which will cause erosion and siltation of creeks as noted in the EIS (p. 4-9).

**CONCLUSION**

In conclusion, the CBD feels that the proposed action is possibly worse than the current situation if the EIS is accurate. No alternative is advanced that could be called: cost effective, no grazing, minimal development, or maximal for ecosystem and listed species restoration and conservation of our threatened natural heritage. We believe that the proposed action would place the BLM in violation of existing environmental protection laws.

16-59

We recommend that the draft EIS be withdrawn and reworked to advance a fifth "restoration" alternative, to be advanced as preferred by the agency and consistent with applicable law.

Sincerely,



Martin Taylor, Ph.D.  
Coordinator

16-58. Any subsequent utility expansions or new right-of-way applications will be individually analyzed for direct, indirect, and cumulative impacts.

16-59. Thank you for your comments.

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 **Larry Shults**  
11/26/01 08:47 AM


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cc:  
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 **Darrell Tersey**  
11/23/01 08:14 AM

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 **Martin Taylor**  
11/22/01 01:11 PM

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cc: darrell\_tersey@blm.gov, grant\_drennen@blm.gov, CSDP listserve  
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<MikeS@thephxzo.com>  
Subject: Las Cienegas comments- addendum

Dear Mr McInay

Further to our comments submitted yesterday, we wish to add these further comments on the draft EIS for the proposed RMP on the Las Cienegas NCA.

The Arizona State Supreme Court has just ruled that environmental groups can now competitively bid for State Trust grazing leases without having to run cows (see article below). There is already many such groups ready to outbid ranchers by two or more times to acquire state leases, restore cow-damaged landscapes and boost revenue for state education.

16-60 | The BLM is therefore no longer obligated to run livestock on the state lands on Las Cienegas planning area for which it holds leases. Indeed the BLM could offer to sublease these state lands to environmental groups who wish to remove all livestock and restore this unique area to its natural glory.

16-61 | The analysis in the draft EIS of the no grazing alternative 4, is heavily based on the assumed inevitability of grazing on state trust lands using "traditional practices", and the consequent necessity to fence off all BLM land from State Trust lands at great expense to protect BLM lands from trespass livestock. This assumption is no longer

16-60. The Bureau is aware of the Arizona Supreme Court ruling involving the renewal of grazing leases on State Trust Lands. The BLM is not obligated to lease state land for livestock grazing, but does currently lease state land for this use because it facilitates the proper management of the adjacent federal lands located in the Las Cienegas National Conservation Area. The Bureau will continue this practice under the proposed action as long as it is appropriate and it is determined to achieve the land use objectives identified through our planning process. The Bureau will assess this and other court rulings, and may identify and develop alternative actions in the future should the rulings change the current legal and political environment. See also response 16-4.

If BLM chose to no longer run livestock on the State grazing leases that it holds, it is assumed that BLM would either need to relinquish the leases or apply for conservation use. BLM would presumably not be authorized to sub-lease the State lands for conservation use unless the State Land Department had already approved an application for conservation use. Since applications for conservation use, based on the very recent Arizona Supreme Court decision that you referenced, have not yet been tested, it can only be speculated what the potential outcomes might be.



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**Letter 16, Page 32 (continued)**

16-61. Alternative 4 in the EIS is an alternative that assesses the impacts of not authorizing livestock grazing on the federal lands in the planning area. The Bureau does not administer livestock grazing on the adjacent state lands leased in the area. The no grazing alternative assesses the impacts of fencing the federal lands as an action necessary to prevent unauthorized grazing of the federal lands from any adjacent lands where livestock grazing is currently practiced. If the adjacent state or private lands did not allow grazing the proposed fencing would not be necessary to assess the no grazing alternative. The Bureau will assess the recent Arizona Supreme Court ruling as it is interpreted and implemented in the future, and may identify and develop alternative actions should the rulings change the current legal and political environment. See also responses 16-3 and 16-54.

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tenable. Now cattle could be readily removed from both state and BLM lands, and all fences eliminated. The prospects are astounding for recovery of the many imperiled species and game animals currently suffering from livestock ranching in the Las Cienegas area.

16-62

Consequently, the draft EIS should be completely reanalyzed in the light of this very different legal landscape and a new draft EIS issued for a public comment period with "no grazing" on all lands in the planning area as the agencies preferred alternative for endangered species, wildlife and ecological restoration. We look forward to working with all groups seeking an end to livestock grazing on the NCA, in developing this preferred alternative.

sincerely,  
[IMAGE]  
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Leasing to save grazing land OK'd

By Carol Sowers  
The Arizona Republic  
Nov. 22, 2001

Environmentalists on Wednesday won a major court victory that will allow them to seek leases on grazing land in order to preserve it.

The decision reversed an earlier Arizona Court of Appeals ruling that said those wishing to lease grazing land had to put livestock on it.

The Arizona Supreme Court ruled that the state Land Department was wrong when it said that environmentalists could not apply to lease state grazing land for conservation. Environmentalists wished to lease the land and then not put cattle on it, thereby saving the land from what they consider the

16-62. See responses 16-15 and 16-60. Removal of livestock from BLM managed public lands is prescribed under Alternative 4 in the RMP and analyzed in the FEIS. As stated in the responses above, while the Bureau currently leases State lands for livestock grazing to facilitate the proper management of the adjacent federal lands, the Bureau does not administer the livestock use of these lands. The State Land Department would make any decisions regarding removal of livestock from State Trust lands and their decision would not be part of this RMP. However, the cumulative impacts analysis for Alternative 4 includes the possible scenario of livestock grazing ending on State Trust lands as well as on public lands. Should BLM acquire the State Trust lands in the future, it would then be in a position to make a decision about whether livestock grazing would be continued on these lands. In the interim, in order to adequately assess the alternative of not allocating forage for grazing on the federal lands in the planning area it is necessary to include an analysis of fencing the federal lands from adjacent lands where grazing is currently authorized.

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ravages of grazing.

In the opinion, the justices said that Land Department officials "may not summarily disregard and label restorative uses as inappropriate for grazing land."

Attorney Tim Hogan represents Forest Guardians, the environmental group that filed the lawsuit against the Land Department. He said the Forest Guardians will now apply for 10-year leases on 16,000 acres of grazing land in Pinal County; 162 in Santa Cruz; and 5,000 in Coconino County.

Land Department officials said they had just received the court's decision and were not prepared to comment.

Hogan, of the non-profit Arizona Center for Law in the Public Interest, said that allowing Forest Guardians to lease the land is a good deal for Arizona taxpayers.

He said the group is willing to pay two to five times the amount charged for grazing. The state charges \$2 a head for livestock each year, but the group will offer what would amount to \$4 to \$10 a head, even though the land will not be used for grazing.

"We just want to lease overgrazed land, revegetate it and return it to its pristine form," Hogan said.

The justices wrote they could think of no reason that the state should deny the "arguably best bidder" simply because they want to restore the land.

If the environmental group wins the leases, cattle currently grazing on the land would have to be relocated. But Hogan said that often ranchers move cattle from overgrazed land to allow it to rejuvenate.

Reach the reporter at [carol.sowers@arizonarepublic.com](mailto:carol.sowers@arizonarepublic.com) or

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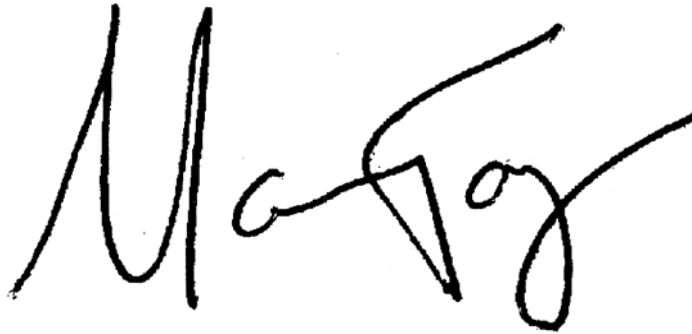
*Chapter 6: Public Comments and Responses*

Letter 16, Page 35

(602)

444-8058.


On the web at: <http://www.biologicaldiversity.org/>

A handwritten signature in black ink, appearing to read "M. King". The signature is written in a cursive style with a large initial "M" and a long, sweeping underline.

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Chapter 6: Public Comments and Responses

Letter 17, Page 1

 **Southwest Transmission**  
COOPERATIVE, INC. P.O. BOX 2195 • BENSON, ARIZONA 85602 • (520) 586-5599 • southwesttransmission.org

**RECEIVED**  
NOV 16 2001  
TUCSON FIELD OFFICE

November 14, 2001

David McInay  
Bureau of Land Management  
12661 E. Broadway  
Tucson, Arizona 85748

**RE: Las Cienegas Resource Management Plan & Environmental Impact Statement**

Dear Mr. McInay:

Effective August 1, 2001, Arizona Electric Power Cooperative, Inc. (AEPCO) was reorganized into the following three companies.

1. Arizona Electric Power Cooperative, Inc. - the generation service provider, owner and operator of the Apache Generation Station.
2. Southwest Transmission Cooperative, Inc. - the transmission service provider, owner and operator of the transmission system.
3. Sierra Southwest Cooperative Services, Inc. - the certificated energy service provider, which will also provide the staffing services to AEPCO and SWTransco.

The headquarters for the above three companies will remain at 1000 South Highway 80, Benson, Arizona, 85602. All internal contacts and their telephone numbers will also remain the same.

The staff of Southwest Transmission Cooperative, Inc. (SWTransco) has reviewed the Draft Las Cienegas Resource Management Plan (RMP) and Environmental Impact Statement (EIS) for potential impacts to its Pantano-Kartchner (PA-KA) 115KV transmission line and offer the following information and comments.

SWTransco's Pantano Substation and approximately 24.8 miles of the right of way for the PA-KA 115KV transmission line are located within the boundaries of the Las Cienegas planning area. This includes transmission line structures 1-121, from Pantano Substation to approximately 2 miles north of US Highway 82 and structures 137-193, south of US Highway 82 to the Fort Huachuca Military Reservation boundary.

Alternative 3 of the Draft EIS identifies Section 7, Township 18 South, Range 8 East, as being designated an Area of Critical Environmental Concern (ACEC). If this management plan is selected, SWTransco respectfully requests that restrictions not be imposed that would limit our access road and transmission line maintenance activities on approximately one mile of the right of way for structures 37, 38 & 39.

17- 1. Utility owners would be allowed through ACEC's to access to their facilities, but required to stay on designated roads. To avoid impacts to wildlife and vegetation, maintenance methods would be restricted.

Chapter 6: Public Comments and Responses

Letter 17, Page 2

David McInay  
November 14, 2001  
Page 2

Alternatives 2, 3 and 4 have identified portions of Sections 7 and 19, Township 18 South, Range 18 East and Section 9, Township 19 South, Range 19 East, as a designated utility corridor. These are areas where segments of the PA-KA 115kV transmission line are currently located. As a designated corridor for new and existing utilities routed through this portion of the Las Cienegas Conservation Area (LCNCA), SWTranSCO does not anticipate any significant impacts to its existing facilities as a result of this designation. However, it should be noted that increased use by the public of the transmission line access roads will increase SWTranSCO's liability and could increase the potential for damage to SWTranSCO's transmission line facilities.

17- 2

All of SWTranSCO's transmission line maintenance activities are ground based. To ensure the reliability of its transmission system, SWTranSCO must be allowed to continue to maintain all access roads associated with the PA-KA line located within the LCNCA, and to maintain clear work areas around the base of each structure to provide a safe work area for line maintenance personnel and equipment set up.

17- 3

Due to prohibitive cost, SWTranSCO requests that owners of existing high voltage transmission lines not be required to remove, relocate or replace existing facilities with underground installations and that new facilities not be required to be constructed underground within the boundaries of the LCNCA. As the Sierra Vista area continues to develop, SWTranSCO anticipates that it may be necessary to upgrade the existing 115kV transmission line to 230kV to meet the increase in demand for electricity associated with this growth.

17- 4


SWTranSCO would greatly appreciate the opportunity to partner with the BLM in this planning process and to discuss any proposed road closures that would limit its access or seasonal restrictions that could impact transmission line maintenance activities.

17- 5

SWTranSCO supports the selection of Alternative 3, as having the least impact on the operation and maintenance of SWTranSCO's PA-KA 115kV transmission line.

17- 6

Sincerely,



William H. Wells III  
Land Services Administrator

c: G. Grim  
B. Riley  
M. Saunders  
T. McCaulou  
PA-KA 115kV File

- 17- 2. The utility maintenance access road in Section 7 can only be reached and traveled from the north and the south. This road is not passable as a direct route due to the high erosion in the center. In section 19, BLM may consider closing that segment of the access road to the public if an alternative route can be found.
- 17- 3. SWT and other authorized utility companies do have legal rights to maintain their access roads. It is the user's responsibility to minimize maintenance activities, not be excessive in trimming or clearing vegetation and trees, not harm wildlife, and conform with the NCA values and goals.
- 17- 4. Utility owners should not be required to relocate or remove facilities from existing corridors unless they are abandoned. However, any major modifications to existing lines or new rights-of-ways will be considered and analyzed. Whether new or modified facilities are to be approved will be determined on a case by case basis after a NEPA analysis which will consider all the impacts of the proposal. Decisions on whether utilities would best be placed above ground or underground and other specific design features of each project will also be determined through the NEPA process.
- 17- 5. BLM can and will meet with SWT and any other utility companies to further discuss the effects of proposed road closures and access to their facilities.
- 17- 6. Your comment has been noted.

Chapter 6: Public Comments and Responses

Letter 18, Page 1

November 23, 2001

ATTN:  
Shela McFarlin, Field Manager  
Tucson Field Office  
Bureau of Land Management

FROM:  
Lorena Babcock Moore  
Geologist  
217 W. Rock St., Corona de Tucson, AZ 85641  
(520) 762-0605

Dear Ms McFarlin,

Below are my comments on the Draft Las Cienegas Resource Management Plan and Environmental Impact Statement. I have addressed five issues, numbered in descending order of significance to this area worthy of protection and conservation.

1. Grazing and Cattle Ranching:

18- 1

I am opposed to the continuation of any grazing or ranching activities within the conservation area. There is nowhere that has not sustained damage, sometimes severe and lasting, during the area's history as a ranch. The current rancher's use of "enlightened" management practices only serves to emphasize that the conservation area cannot support grazing, since much of the area that his cattle use is in poor condition. I do not support any cattle grazing on public land, but it is particularly offensive when a tiny piece of land singled out as a "National Conservation Area" (presumably at least partly for its national ecological significance) is managed primarily as one man's hobby ranch.

2. Botanical Inventory

18- 2

In the current plan, the discussion of the vegetation reports only classifications and conditions based on rangeland management criteria: important forage plants were studied along narrow "transects" to determine an area's value as pasture. This is inappropriate for a conservation area, even if it is to be managed primarily as grazing land. Ecological classification and assessment of conditions should be based on studies of all the plants that occur naturally (or should occur) and on comparison with similar habitats outside the planning area. A comprehensive botanical inventory of the entire area is needed. The lack of such basic natural history information, and stated intent to gather it - not even a preliminary "flora" list, in a management plan that was five years in the making, is inexcusable.

18- 3

NOTE: The needle-spined pineapple cactus (*Echinomastus erectocentrus* var. *erectocentrus*), a "BLM Sensitive Species", does occur in the planning area.

18- 4

3. Unaddressed Cienega

At the end of Road EC-903, in the heart of the planning area, is a small cienega that is close to a parking/camping site on Cienega Creek. So far, human visitors have respected this fragile place,

18- 1. Your comment has been noted. The ecological conditions on the Empire-Cienega, Empirita, and Rose Tree ranches have been inventoried using methodologies approved and/or recognized by the BLM, NRCS, Arizona State Land Dept., University of Arizona, USDA, ARS, and others. These lands have been determined to be in satisfactory or better ecological condition and the watershed and majority of riparian systems have been determined to be in properly functioning condition. BLM has a mandate to allow multiple uses including grazing if the use is determined to be based on sustained yield. Furthermore, section 4 (a) of the Las Cienegas NCA Act, prescribes the conservation, protection, and enhancement of fourteen unique and nationally important resources and values while "allowing livestock grazing and recreation to continue in appropriate areas". The Act further states that the Secretary "shall permit grazing subject to all applicable laws, regulations, and Executive orders consistent with the purposes of this Act". The four ranches in the NCA and acquisition boundary support several generations of five or six families and provide employment and opportunities to many other people in the community.

18-2 The vegetation communities on the majority of public lands in the planning area (including both the NCA and Acquisition Planning District) were inventoried for this planning effort in 1995, using

## Chapter 6: Public Comments and Responses

### Letter 18, page 1 (continued)

- 18- 2. (continued)  
the Ecological Site Inventory methodology recognized by BLM, NRCS, Universities, Federal and State governments. This method is based on soil surveys, correlation of ecological sites, and evaluation of the current plant communities (in their totality) as compared to the Potential Historic Climax Plant Community (from a relict or reference area) that the ecological site is capable of producing. Each transect consists of 200 - 40x40 cm plots which covers about an acre. Thirty-two permanent study sites were established on the Empire-Cienega Ranch alone. Plant composition by weight is determined on the site as is current years vegetation production. These study sites represent a “key area” within a particular unique ecological site within a mapping unit. The process is more completely explained in the NRCS and BLM manual and technical references. In addition to the ecological site inventories and riparian inventories, a plant inventory and collection was initiated on the then Empire-Cienega Resource Conservation Area shortly after the public lands were acquired in 1988. The University of Arizona herbarium assisted with plant identification and over 170 species were identified.
- 18- 3. Thank you for this information.
- 18- 4. Canello Hills ladies’ tresses have never been verified on the NCA but additional inventories are needed. Some inventories are planned for 2002. There are a number of small springs with shallow wetlands in the Cienega Creek floodplain from Gardner Canyon to Springwater Canyon. The most notable of these are the ponds near Cinco Canyon which represent the largest and deepest in the area. These and other shallow wetlands (some of which are dry most summers) are subject to seasonal grazing. Not all of these have been located, delineated, season of surface water presence recorded and evaluation for ecological function evaluated (Proper Functioning Condition, USDI 1993). Those that had been located and mapped were included on Map 3-. However, they did not show up well on the map at the scale it was printed in the Draft plan and the map has since been revised. Since a wildfire this spring burned through much of this area, the wetlands are much easier to locate and subsequent inventory and mapping is planned. The “black water” wetlands that you refer to may be in lower Empire Gulch, which except for its upper tip has been excluded from livestock because of the presence of Huachuca water umbel. This area has become increasingly wetter during the last decade, as the watershed and rangeland condition has improved in the surrounding uplands. During the past ten years, the riparian area has expanded for almost a mile northwest from its confluence with Cienega Creek. The flow of sub-irrigation water from Empire Gulch has also increased over the years, causing formerly dry depressions in the benches to become wetted “ponds”. Some of these ponds have replaced dry, sacaton bottoms and developed into Interior Marshland habitat. These on-going changes have resulted in the need to adapt management practices. The rancher has had to build fences to exclude some of these ponds to prevent cattle from getting bogging down in the mud. Similarly, other fencing or management changes may be necessary to maintain or restore ecological function in wetland areas. A riparian management action has been added common to Alternatives 2, 3, and 4 to complete an inventory of these wetland areas and determine future management needs.



Chapter 6: Public Comments and Responses

Letter 18, page 2

18- 4 cont.	possibly because of the formidable hackberry, graythorn, and mesquite thickets that surround most of it. It is a black spring in a marshy depression with abundant yerba mansa and sedges. It is a significant source of water, shade, and shelter for wildlife and birds. It appears to have been used for cattle mostly in winter, and even then infrequently. It offers good habitat for the Canelo Hills Ladies' Tresses ( <i>Spiranthes delitescens</i> ), though when I went there to search for the plant in August 2001, I arrived only hours after cattle had been allowed into the area - there were several cows in the water and the marsh plants had been trampled into a wallow of mud and cow droppings. This place is mentioned nowhere in the plan - not even as a spring or a cattle tank.
18- 5	<p>3. Plant Collection</p> <p>Collecting plants for building materials, crafts, medicinal use, or religious purposes is inappropriate in the Conservation Area, no matter who is doing the collecting. Collecting is allowed on hundreds of square miles of nearby National Forest, State, and BLM lands (some just across the road from the Conservation Area) that are under no special protection. Basketry plants such as beargrass and yucca are also inexpensive and easy to cultivate. Collecting may be necessary for certain scientific studies, although good photos and GPS locations can often be as useful as voucher specimens, and are more easily shared with other scientists and the public.</p>
18- 6	<p>4. Shooting</p> <p>The plan makes no mention of target shooting, which I have encountered while hiking in the conservation area near Cienega Creek. Will BLM continue to allow unregulated shooting? A designated firing range would ultimately create a hazardous waste disposal problem as lead (and undoubtedly garbage) accumulate. I suggest banning all target shooting in the conservation area.</p>
18- 7	<p>5. Road Use</p> <p>Off-road vehicle use will undoubtedly increase in the area as explosive development continues southeast of Tucson. The destruction of vegetation (including large trees) in washes on National Forest land in heavy-traffic areas such as Rosemont, Greaterville, and Gardner Canyon shows that abuse increases with use. I suggest that BLM require all vehicles (even quads, motorcycles, dune buggies etc.) to have mufflers, so they will at least minimize noise, and require these vehicles to stay on designated roads and out of all washes. The closure of washes and roads should be indicated with heavy-duty bars, gates, or grates that will disable a vehicle that tries to cross, not with the current system of nearly-invisible tiny brown signs that are easily ignored or driven over. In at least one case (Wood Canyon), the closure is due to a serious safety hazard due to soil piping that is forming large holes in the road.</p>

18- 5. The BLM has a mandate to allow multiple uses including collecting of plants to meet the public needs and desires if the use is determined to be based on sustained yield and does not adversely affect the existing plant communities or preclude achieving vegetation or watershed objectives. Certain plants are protected and rules are developed to regulate the collection of any plants or plant products to ensure the collections are regulated and do not adversely affect the environment (NEPA, ESA, Policy, Regulation, Permits). 43 CFR 8365.1-5(b)(1) provides for collection of plants referenced in the plan: (b) "Except on developed recreation sites and areas, or where otherwise prohibited and posted, it is permissible to collect from the public lands reasonable amounts of the following for non-commercial purposes: (1) Commonly available renewable resources such as flowers, berries, nuts, seeds, cones and leaves..." Tohono O'odham basket weavers have been harvesting plant products in the planning area for many years. Members of the Tohono O'odham Basketweavers Organization (TOBO) have stated that they wish to continue harvesting basket weaving materials in the planning area, including bear grass, devil's claw and yucca leaves. They consider the harvesting of basket-making materials in the planning area to be a traditional use which extends back into prehistoric times. The Tohono O'odham Nation claims an ancestral affiliation with the Hohokam and

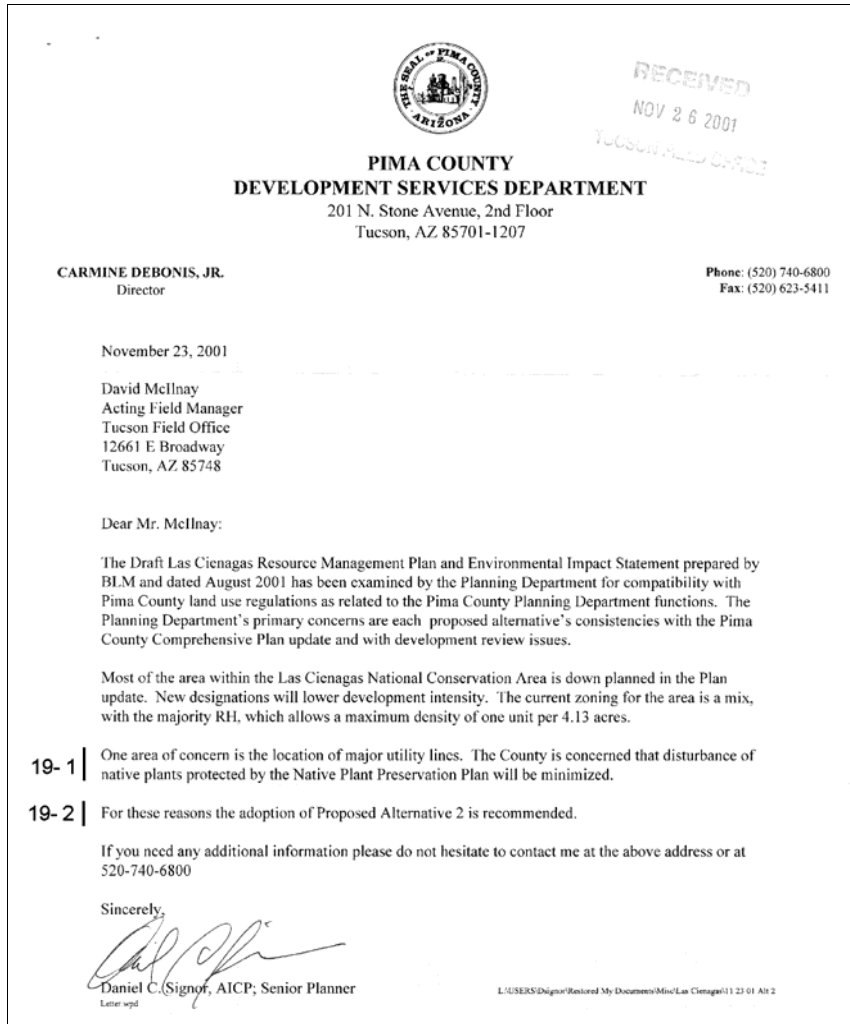
*Chapter 6: Public Comments and Responses*

Letter 18, page 2 (continued)

- 18- 5. (continued)  
Sobaipuri Indians who inhabited the planning area and surrounding lands. The U.S. government, BLM and the State of Arizona officially recognize this claim. Cultural materials excavated from archaeological sites in the planning area and from nearby sites show that both the Hohokam and the Sobaipuri did use bear grass and yucca to weave baskets, mats, bags and various other items used in daily life. Plant collecting by other Native Americans, including those from the San Carlos Apache and Hopi tribes could also be accommodated under this CFR. All plant collecting would require a permit. Collecting would be monitored and regulated to ensure that over-harvesting did not occur.
- 18- 6. Regulations are already in place that allow target shooting but in a safe manner (43 CFR). If target shooting occurs in a manner which is unsafe, endangers people or creates hazardous conditions, or destroys property or resources, then BLM is authorized to issue citations, or close areas to target shooting. No shooting ranges are proposed under any alternative. See also NCA Act in Appendix 1.
- 18- 7. The requirement of mufflers is addressed in 43CFR standards 8343.1 and will be part of the rules and regulations of the public lands in the NCA and Acquisition Planning District. The requirement of mufflers should also reduce noise levels, as should the “not to exceed 25 miles per hour unless otherwise posted” rule. Not driving in washes is addressed in the supplementary rules. Driving in washes is prohibited unless a wash is part of a designated road. A range of options will be considered in closing roads. In some areas, simple carsonite signs have been effective. In other areas, such as those that you refer to, signing has not been effective and structural closures will be necessary.

Chapter 6: Public Comments and Responses

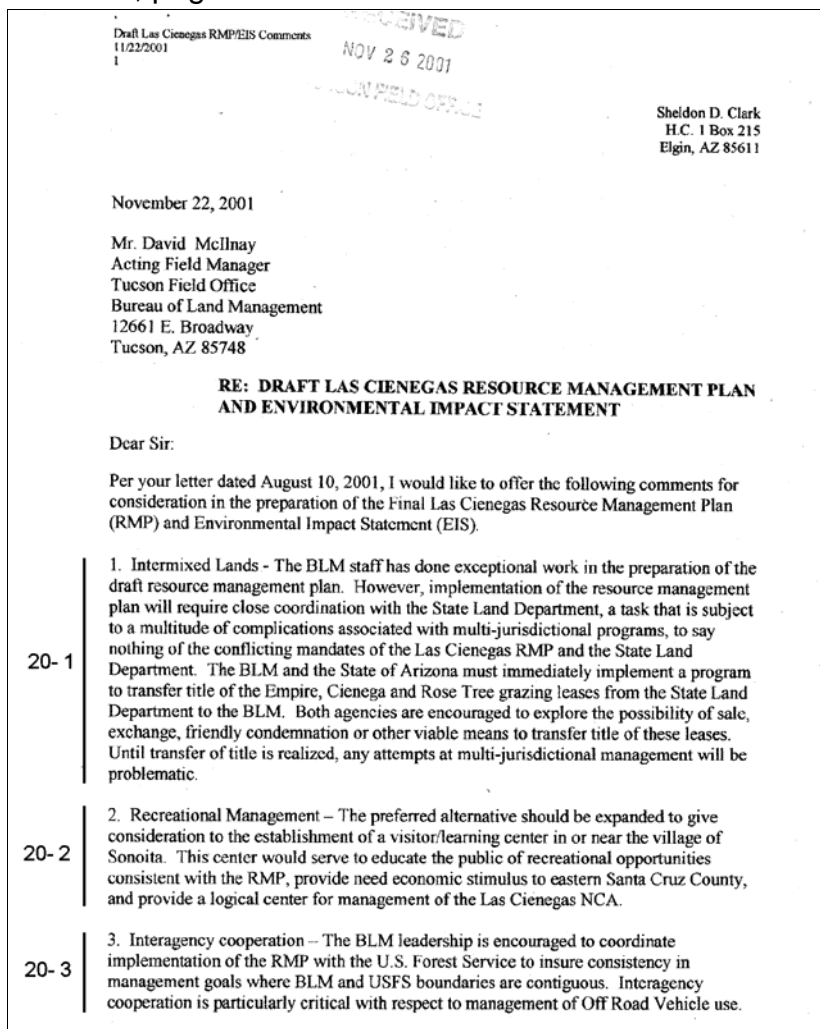
Letter 19



- 19- 1. Surveys for sensitive plants and animals and cultural resources are conducted as part of compliance with National Environmental Policy Act (NEPA). Avoidance or mitigating measures are prescribed as appropriate prior to authorization of any surface-disturbing activities including construction of major utility lines. The designation of utility corridors helps to limit such impacts to specific locations and in the case of the proposed action to areas with existing surface disturbance.
  
- 19- 2. Your comment has been noted.

Chapter 6: Public Comments and Responses

Letter 20, page 1



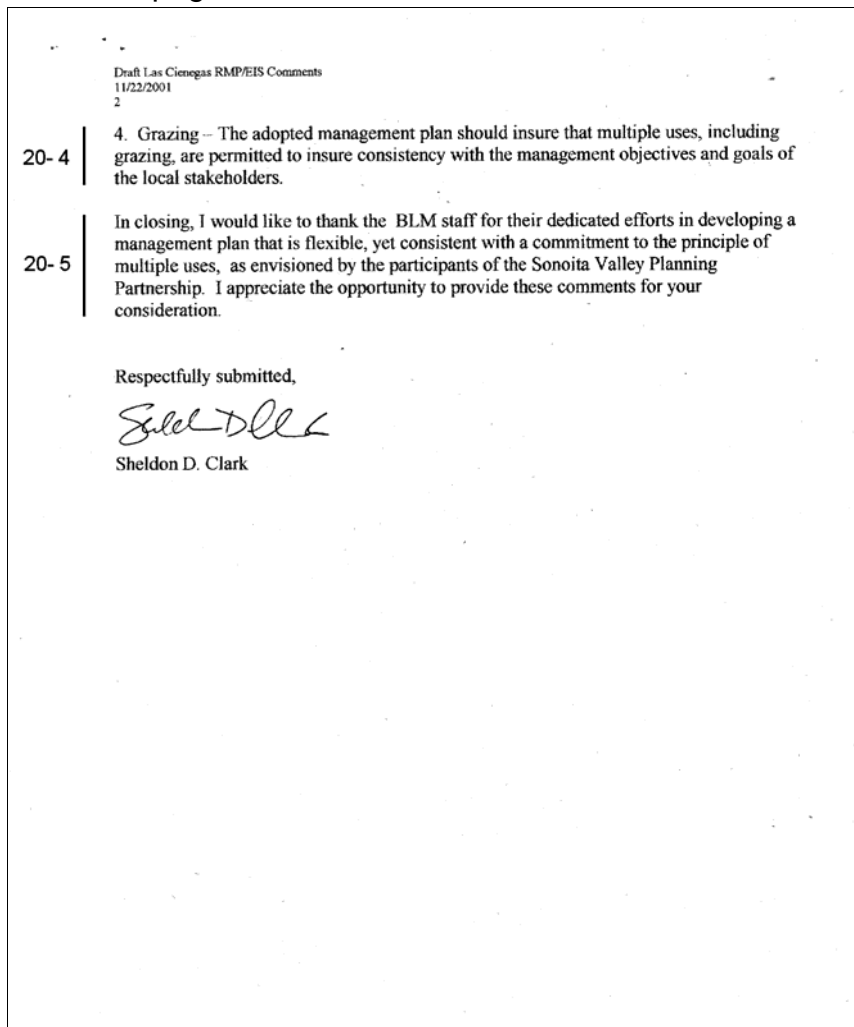
20- 1. See response 16-6.

20- 2. The RMP addresses only BLM managed lands within the NCA. Although locating a visitor center in Sonoita is not within the scope of this document, careful consideration and evaluations to determine cost effectiveness of a visitor center in Sonoita should occur before a decision is made. An interpretive master plan and market analyses would be required. Many opportunities exist to develop a community based visitor center in the Sonoita area. All proposals and locations should be evaluated for purpose, effectiveness and desirability by the community.

20- 3. The BLM will be coordinating implementation of the RMP with the US Forest Service and other state and federal agencies as appropriate.

Chapter 6: Public Comments and Responses

Letter 20, page 2

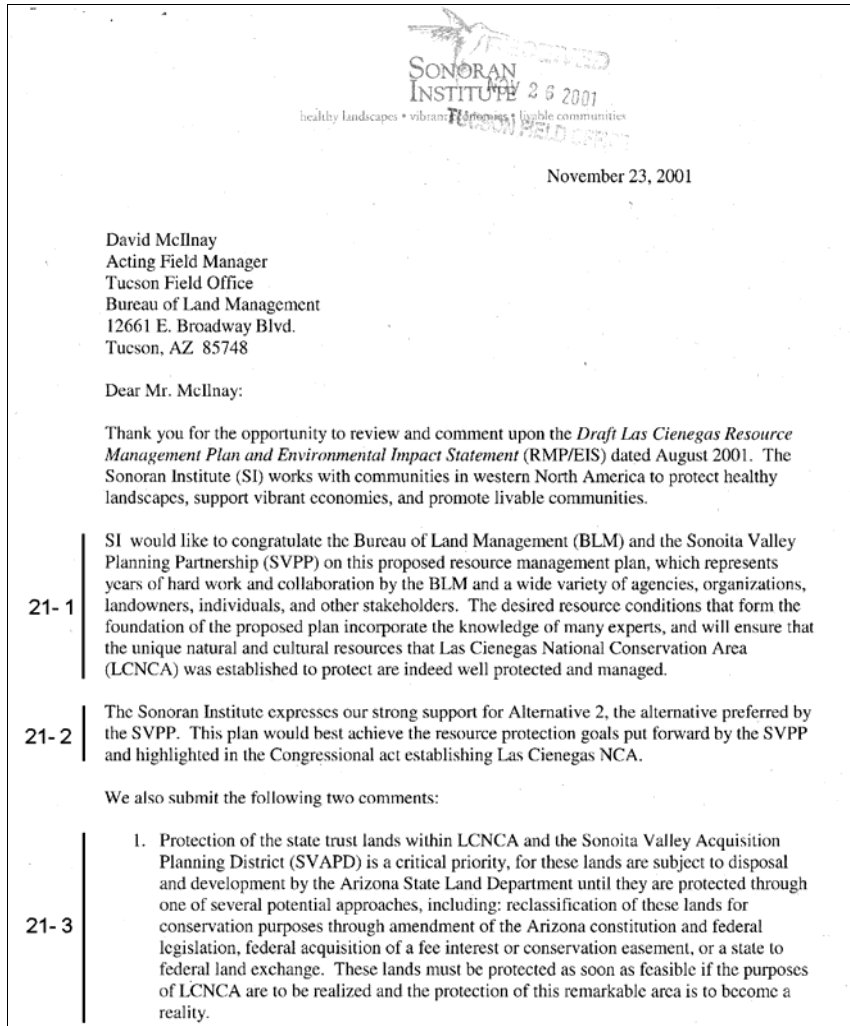


20- 4. See response to Letter #20.

20- 5. Thank You for your comment.

Chapter 6: Public Comments and Responses

Letter 21, page 1



- 21- 1. Thank You for your comment.
- 21- 2. Your comment has been noted.
- 21- 3. See response 16-6.

Chapter 6: Public Comments and Responses

Letter 21, page 2

David McInay  
November 23, 2001  
Page 2

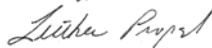
21-4

2. We encourage the BLM to locate the NCA's proposed visitor center within the adjoining "gateway" community of Sonoita. Sonoita's location adjoining LCNCA and between the large northern portion and the smaller, noncontiguous southern portion that includes the Audubon Research Ranch makes it an ideal setting for a visitor center. Placement of the proposed visitor center in Sonoita will both allow the community to experience immediate benefits from its neighboring protected area and avoid development within the boundaries of the protected area. At the visitor center, visitors will be able to view and learn about the Cienega Creek valley's native grasslands and the surrounding "sky island" mountain ranges they link, while also having immediate access to the amenities provided by Sonoita. Local community groups including the Sonoita Crossroads Community Forum and the Sonoita Chamber of Commerce have indicated strong interest in working with BLM to develop an outstanding visitor center for Las Cienegas NCA.

The Sonoran Institute looks forward to working with BLM and the SVPP participants to help implement this Resource Management Plan and to continue developing an effective monitoring system that will allow for successful application of the adaptive management principles it embraces.

Thank you again for the opportunity to comment on this proposed RMP.

Sincerely,



Luther Propst  
Executive Director

21-4. See response 20-2.

Chapter 6: Public Comments and Responses

Letter 22, page 1

RECEIVED  
NOV 26 2001  
TUCSON FIELD OFFICE

PHIL R. OGDEN  
PROFESSOR AND RANGE EXTENSION SPECIALIST, RETIRED  
7123 E. CALLE ARTURO  
TUCSON, AZ 85710  
e-mail: [ogdenp@azstarnet.com](mailto:ogdenp@azstarnet.com)  
Phone: (520)296-7856

November 21, 2001

David McInay, Acting Field Manager  
Tucson Field Office  
12661 E. Broadway  
Tucson, AZ 85748

Dear David:

Subject: Comments on Draft Las Cienegas Resource Management Plan  
and Environmental Impact Statement

**Background**

My professional experience in the Sonoita Valley area began in the fall of 1964 when I became a faculty member at the University of Arizona. Since that time, I have been involved in regular visits and numerous activities within the area. The activities include range research, inventory, management, monitoring, and class and other educational field trips. Currently, I am a member of the Empire-Cienega Ranch biological planning team. I am very interested in the future management of the Las Cienegas NCA and the Sonoita Valley Acquisition Planning District. I have reviewed the draft plan and EIS submitted for review, and my comments are in the following paragraphs.

**General**

22- 1 | With multiple alternatives, issues, resources, uses, objectives, management activities, and impacts, it is difficult to avoid the redundancy that makes a document like this so difficult to write, to read, and to make specific comments that will make any major changes in future activities. I have no suggestions on how to improve this problem. I do support a decision that will implement Alternative 2, the alternative preferred by both BLM and the participants in the Sonoita Valley Planning Partnership. Most of the meaningful comments have already been placed on the table and discussed during the Sonoita Valley Planning Partnership process.

**Planning Issues 11, p. 1-19 and 12, p. 1-20**

22- 2 | **Editorial:** Issues 1 through 10 are listed in bold italics. To be consistent, issues 11 and 12 should also be bold italics.

**Rangeland Health, ¶ 4, left column, p. 2-6 beginning, "Attempting to achieve..."**

22- 3 | **Editorial:** add "on" in second line ( community on ecological sites.....).

22- 4 | **Comment:** Attempting to achieve the historical plant climax community on an ecological site is no guarantee that appropriate management actions will be taken to maintain or achieve

- 22- 1. Thank you for your comment.
- 22- 2. Your comment has been noted and the text has been modified in Chapter 1: Planning Issues.
- 22- 3. Your comment has been noted and the text has been modified in Chapter 2: Desired Conditions: Rangeland Health.



Chapter 6: Public Comments and Responses

Letter 22, page 2

	<p>Comments, Las Cienegas Draft, Ogden, p. 2</p>
22- 4 cont	<p>physical function and biological health of a range ecosystem. Presently, a mesquite and Lehmann lovegrass plant community dominates much of the loamy upland ecological site on the low alluvial terraces adjacent to the Cienega Creek bottomlands. I do not expect the Bureau of Land Management to have the physical or economic resources to change this community back to the historical climax. The good news is that this plant community does maintain, and perhaps even improve, upland soil/site stability and hydrologic function as well or better than the historical climax. The best management actions will be developed by focusing on management of this existing community rather than emphasizing trying to change it to the historical climax.</p> <p><b>Recommendation:</b> Replace the last sentence (Actions selected ...) of this paragraph with the following statement: When it is unrealistic and/or physically and economically infeasible to attain the historical climax plant community, management actions should emphasize maintaining upland soil/site stability and hydrologic function of the site.</p> <p><b>Alternative 1 Livestock Grazing Management Actions, Table 2-12, p. 2-73</b></p>
22- 5	<p><b>Comment:</b> Table column headings "BLM Cows" and "ASLD Cows" are misleading. The cows are all privately owned.</p> <p><b>Recommendation:</b> Column 6 should be "Cows <u>on</u> BLM" not "BLM Cows" Column 9 should be "Cows <u>on</u> ASLD" not "ASLD Cows"</p> <p><b>Alternative 1 Livestock Grazing Management Actions, ¶2, left column, p. 2-73, beginning "If the four..."</b></p>
22- 6	<p><b>Comment:</b> The term "available forage" at the beginning of line 5 of this paragraph suggests to many readers that the percentages which follow in the paragraph are percentage forage utilization levels which would be observed on the range in favorable, normal, and unfavorable years. In reality, as calculated in this document, the percentages represent the portion of forage allocated to livestock use.</p> <p>The Range Inventory Standardization Committee, Society for Range Management defined <b>Available Forage</b> as: "...that portion of the forage production that is <u>accessible</u> (underline added) for use by a specified kind or class of grazing animal." (RISC, 1983. Guidelines and Terminology for Range Inventories and Monitoring. Report to Board of Directors). This same definition for available forage is found on p. 43 of BLM TR 4400-3 (1984), Rangeland Monitoring - Utilization Studies, and in other manuals of this series.</p> <p>The method of calculating available forage as used in this publication, however, is described at line 12, paragraph 2, right column, p. 2-73 as: "...50% of the total vegetation produced multiplied by the current 50% utilization rate on those lands allocated for livestock grazing." The multiplication of the total vegetation production by 50% is a calculation of available forage, as defined in the paragraph above. The second multiplication by a 50% utilization rate provides an estimate of the portion of the total vegetative production that is allocated to livestock and is usually referred to as useable forage. <b>Useable Forage</b> is defined in both of the references provided above as: "...that portion of the forage that can be grazed without damage to the basic resources; may vary with season of use, species, and associated species."</p>

- 22- 4. The point you make is a good one. It can be very expensive, and perhaps even impossible, to restore all the ecological sites to their historic climax plant community. We do however believe it is a satisfactory vegetation goal to seek. We believe that those areas invaded by mesquite and Lehmann's lovegrass are not the "desired plant communities" the group wanted to achieve. The native grassland would be preferable to them. However through the Biological Planning Process and the NEPA process the facts that you presented would be brought out. The economic or biological feasibility would be brought to everyone's attention and one of the alternative would be chosen as the decision.
- 22- 5. Your comment has been noted and the text in Table 2-12 has been modified to change column headings as recommended.
- 22- 6. Your comment has been noted and the text in Chapter 2: Livestock Grazing Management Actions has been modified as recommended.

Chapter 6: Public Comments and Responses

Letter 22, page 3

	Comments, Las Cienegas Draft, Ogden, p. 3
22- 6 cont	<p><u>Recommendation</u>: Change available to allowable at the beginning of line 9, ¶ 2, left column, p. 2-73, and at line 7 of this paragraph, after “.....unfavorable years (Table 2-13).”, insert the sentence: These percentages are the portions of the forage allocated for livestock grazing (useable forage) that are utilized in the scenarios presented.</p> <p><b><u>Alternative 1 Livestock Grazing Management Actions, line 13, ¶ 2, right column, p. 2-73</u></b></p>
22- 7	<p><u>Comment</u>: Based on previous comment</p> <p><u>Recommendation</u>: Change “available forage....” to useable forage....</p> <p><b><u>Alternative 1 Livestock Grazing Management Actions, Tables 2-13 and 2-14, p. 2-734</u></b></p>
22- 8	<p><u>Comment</u>: Based on previous comment</p> <p><u>Recommendation</u>: Change headings of columns 7 and 8 from Available Forage to Useable Forage</p> <p><b><u>Alternative 1 Livestock Grazing Management Actions, line 2, left column, below Table 2-14</u></b></p>
22- 9	<p><u>Comment</u>: Based on previous comment</p> <p><u>Recommendation</u>: Change “...the percentage available” to ...the percentage useable</p> <p><b><u>Alternative 2 Livestock Grazing and Recreation Management Actions, line 8, ¶ 2, left column, p. 2-101</u></b></p>
22-10	<p><u>Comment</u>: Based on previous comment</p> <p><u>Recommendation</u>: Change “The available forage....” to The useable forage....</p> <p><b><u>Alternative 2 Livestock Grazing and Recreation Management Actions, Tables 2-21, 2-22, and 2-23, pp. 2-102 and 2-103</u></b></p>
22-11	<p><u>Comment</u>: Based on previous comment</p> <p><u>Recommendations</u>: Change column 6 heading from BLM Cows to Cows on BLM and Column 8 heading from ASLD Cows to Cows on ASLD</p> <p>In line 4 of footnote 2, Table 2-21, Change “The available forage...” to The useable forage....</p> <p><b><u>Alternative 2 Livestock Grazing and Recreation Management Actions, Table 2-24</u></b></p>
22-12	<p><u>Comment</u>: Based on previous comment</p> <p><u>Recommendation</u>: Change headings for columns 7 and 8 from Available Forage to Useable Forage</p>

- 22- 7. Your comment has been noted and the text in Chapter 2: Livestock Grazing Management Actions has been modified as recommended to change available forage to useable forage.
- 22- 8. Your comment has been noted and the text in Tables 2-13 and 2-14 has been modified to change column headings as recommended.
- 22- 9. Your comment has been noted and the text in Chapter 2: Livestock Grazing Management Actions has been modified as recommended to change percentage available forage to percentage useable forage.
- 22-10. Your comment has been noted and the text has been modified as recommended to change available forage to useable forage.
- 22-11. Your comment has been noted and the text in Tables 2-21, 2-22, and 2-23 has been modified as recommended.
- 22-12. Your comment has been noted and the text in Table 2-24 has been modified as recommended.

Chapter 6: Public Comments and Responses

Letter 22, page 4

	Comments, Las Cienegas Draft, p. 4
	<b><u>Alternative 3 Livestock Grazing and Recreation Management Actions, lines 3 and 4, ¶ 1, right column, p. 2-121</u></b>
22-13	<b><u>Comment:</u></b> Based on previous comment <b><u>Recommendation:</u></b> Change “available forage” to useable forage in these 2 lines
	<b><u>Alternative 3 Livestock Grazing and Recreation Management Actions, Table 2-28, p. 2-121</u></b>
22-14	<b><u>Comment:</u></b> Based on previous comment <b><u>Recommendation:</u></b> Change column 6 heading from BLM Cows to Cows on BLM and column 8 heading from ASLD Cows to Cows on ASLD.
	<b><u>Alternative 3 Livestock Grazing and Recreation Management Actions, Table 2-29, p. 2-122</u></b>
22-15	<b><u>Comment:</u></b> Based on previous comment <b><u>Recommendation:</u></b> Change headings for columns 7 and 8 from Available Forage to Useable Forage.
	<b><u>Alternative 4 Livestock Grazing and Recreation Management Actions, line 13, ¶ 4, right column, p. 2-130</u></b>
22-16	<b><u>Comment:</u></b> Based on previous comment <b><u>Recommendation:</u></b> Change “The available forage...” to The useable forage....
	<b><u>Alternative 4 Livestock Grazing and Recreation Management Actions, Table 2-31, p. 2-131</u></b>
22-17	<b><u>Comment:</u></b> Based on previous comment <b><u>Recommendation:</u></b> Change headings for columns 9 and 10 from Available Forage to Useable Forage
	<b><u>Glossary, p. G-2</u></b>
22-18	<b><u>Comment:</u></b> The definition provided for Available Forage in this glossary is inconsistent with the definition recommended by the Range Inventory and Standardization Committee, Society for Range Management and adopted by BLM as discussed previously in my comments. This inconsistent use of terminology easily leads to misunderstanding and argument as to what the percentage forage use numbers really mean. <b><u>Recommendation:</u></b> Omit the definition of Available Forage in this glossary and add the definition of Useable Forage: “That portion of the forage that can be grazed without damage to the basic resources; may vary with season of use, species, and associated species.”

- 22-13. Your comment has been noted and the text has been modified as recommended to change available forage to useable forage.
- 22-14. Your comment has been noted and the text in Table 2-28 has been modified as recommended.
- 22-15. Your comment has been noted and the text in Table 2-29 has been modified as recommended.
- 22-16. Your comment has been noted and the text has been modified as recommended to change available forage to useable forage.
- 22-17. Your comment has been noted and the text in Table 2-31 has been modified as recommended.
- 22-18. Your comment has been noted and the definition of useable forage has been incorporated into the Glossary.

Chapter 6: Public Comments and Responses

Letter 22, page 5

Comments, Las Cienegas Draft, Ogden, p. 5

**Conclusion**

This document does provide background for communication regarding future management actions, and should be technically correct. I have seen small misconceptions develop into large communication issues. Attention to detail and consistency are important in management plans and Environmental Impact Statements.

22-19 | My comments and recommendations do not change my support for Alternative 2 as the decision alternative.

Sincerely yours,

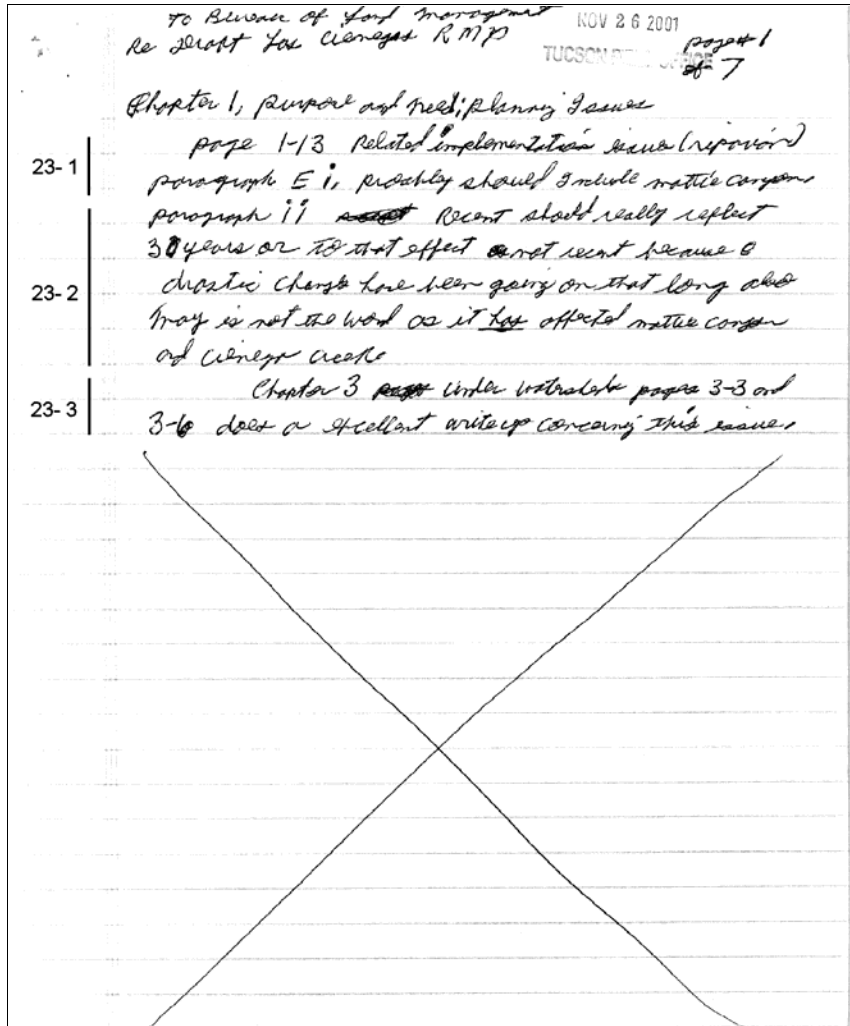


Phil R. Ogden, Retired

22-19. Your comment has been noted.

Chapter 6: Public Comments and Responses

Letter 23, page 1



- 23- 1. Your comment has been noted and the text has been modified to include Mattie Canyon.
- 23- 2. Your comment has been noted and the text has been modified.
- 23- 3. Thank you for your comment.

Chapter 6: Public Comments and Responses

Letter 23, page 2

	<p>TO Bureau of Land Management                  Re. Draft for Colorado RMP <span style="float: right;">page 2 of 7</span></p>
23-4	<p>Chapter 7 <sup>page 2-17</sup> Table 2-4 comparison of land use plan alternatives <sup>proposed</sup>  <del>refers</del> public Land Road Designation <sup>alternative 2 proposed</sup>                  refers to map 2-6. I had map show the road to Edwards well as closed to all travel, or limited to Reregistered. This <del>is</del> not correct. At previous SVUP meetings it had been determined that said road to Edwards well would remain open but the road of questionable status down Fremont Canyon would be closed or limited. At the SVUP meeting of September 29, 2001 this was discussed and someone agreed that was in minutes of said meeting. <u>Page 5 of 6 said needed correction not later map 2.</u> Bring this up only at that time as said correction may be lost while Karon or Matthewly Lane etc.</p>
23-5	<p>The loop road from Apache Spring thru Upper Wood Canyon of Lower Matthee Canyon was also indicated as is shown as the proposed route. The only problem I see with this is at times especially during the rainy season the road from <del>Wood Canyon</del> <sup>Apache Spring</sup> on to and down Matthee Canyon can become very hazardous or impassable. The <del>road</del> connecting road down the Spence <sup>Wood</sup> Canyon is shown as open to administrative use only. This road is maintained somewhat by the Lessee, Matthewly Lane. The hazardous conditions <sup>over</sup> <del>over</del> to Matthee Canyon and down are <del>are</del> in effect the road down Spence Wood Canyon could be temporarily used by the public.</p>

- 23- 4. Your comment has been noted and Map 2-6 has been corrected showing the road to Edwards well open.
- 23- 5. Back roads are subject to closure during rainy season for human safety and to prevent damage to resources. Text has been added to the road designation management actions to clarify that administrative use roads may be opened temporarily as alternative access routes for public use roads which need to be closed for resource or public safety reasons.

Chapter 6: Public Comments and Responses

Letter 23, page 3

To Bureau of Land Management  
 Re. Draft Las Cienegas RMP Page 3 of 7

Chapter 7 page 2-17, Table 2-4, map 2-6 continued

23-6 I.T. was also concerned that the power line company may do some maintenance of the road down by the canyon but has no set schedule <sup>only when they need to get on.</sup> Apparently BLM realizes there is a need for road road maintenance of the road for funds to do so. If this happens there would be no problem with above loop road. <sup>Recurring road funds</sup> may be questionable in light of September 11, 2001 and additional funds need schedule to combat terrorist <sup>for</sup> for opportunity the next several years.

23-7 There are numerous roads on the plan on state trust lands especially within the Cienega ranch area that are shown as closed to all motorized travel or administrative use only. Writer does not think this is a good idea as this would close access to large areas for hunting, recreation, pack handling and other uses. This would also congest the public on the remaining open instead of dispersing the public throughout the whole area.

23-8 Apparently the roads on state trust lands are not public lands therefore ~~are~~ cannot be part of the RMP and appealable in the instance?

23-9 also apparently the Las Cienegas Legislation calls for ~~not~~ not loss of roads, all existing roads on public lands would ~~not~~ be subject to closure to all motorized vehicles?

- 23-6. Deferred maintenance dollars have been requested in BLM's operating budget for Las Cienegas to maintain back country roads. We do not know yet if the funding has been granted.
- 23-7. See response 13-3. Yes, use may be concentrated in some areas, however it is intended that concentrated use will be monitored and managed. Also note that roads on State Trust lands cannot be designated and designations implemented through this plan, only if the lands are acquired by BLM.
- 23-8. You are correct. Designations or other management of roads on State Trust Lands are not being prescribed in this plan. However, some proposed route designations on intermixed State Lands were included to show designations that would be enacted should the lands be acquired by BLM.
- 23-9. Rather than calling for no closures of roads to motorized vehicles as stated in your comment, the Las Cienegas NCA Act says that the management plan will include "provisions designed to ensure that if a road or trail located on public lands within the Conservation Area, or any portion of such a road or trail, is removed, consideration shall be given to providing similar alternative access to the portion of the Conservation Area serviced by such removed road or trail." Many of the road closures proposed in this plan are for roads which provide duplicate access to the same area. Other road closures are necessary to protect sensitive resources, to avoid hazardous situations, or to provide an alternate of non-motorized access to an area.

Chapter 6: Public Comments and Responses

Letter 23, page 4

To Bureau of Land Management  
Re: Draft for Congress RMP. page 4 of 7

Chapter 2 part B activity plan alternative 1 alternative 2

page 2-101 paragraph 3

23-10 In the personnel issues - why is Blue Grama not listed?

page 2-101 paragraph 4 continues to page 2-104,  
Biological Planning Team

23-11 Very Excellent idea on this for not per production units

page 2-102, 2-103

Variable Drought Use Tables 2-24 2-22- 2-23

I have no problem with the total numbers in the table but in the breakdown of the carrying capacity between BLM over and ASLD over. Historically the south end of the Los Cienegas Reserve had a higher carrying capacity than the north end. The south end is composed mainly BLM over where the uplands have a higher carrying capacity than the north end uplands. The forest and BLM over also include all <sup>locator sites</sup> ~~most of the~~ better lands which have a very very high carrying capacity. If winter BLM over should have a carrying capacity of 1000 and the state lands a carrying capacity of 498 animal units at meaty at total carrying capacity of 1498. Which would make the carrying capacity of any given year BLM over 66.76% and ASLD over 33.24% of the carrying capacity of any year as a rule more or less and 20% opportunity now would need adjustment page 2-21 table 2-5 call for 30% 40% utilization and the interim activity plan allows 40-60% utilization.

23-12

Los Alamos  
page 207

23-10. The text has been modified to include Blue Grama.

23-11. See response 2-1.

23-12. See responses 2-2 & 2-3.



Chapter 6: Public Comments and Responses

Letter 23, page 5

70 Bureau of Land Management  
 Re: Final Draft for Colorado RMP page 5 of 7  
 Continued  
 Chapter 7 part B activity plan alternatives: alternative 2

23-13 page 2-105 Summary of Empire County Geology/geomorphology paragraphs 1 thru 5. Excellent as this has not been practical in parts.  
 paragraph 3 also state alternative 2 would also develop the large riparian projects proposed for alternative 1. I see riparian and 7 acre proposal on the Empire and only for riparian, Empire County.

Chapter 3. water resources, fire - affected Environment  
 page 3-7 paragraph water wells.  
 23-14 Jack Kreamer did not develop any irrigation wells just instead of domestic water wells for farming purposes.

23-15 page 3-7 Spring  
 There is on the Empire another significant Spring Whiskey Springs. Had pipeline, Tom's Ranch, no one currently was originally aware of it along canal. was used year around for livestock water.  
 I notice Rock House of Sanford Springs are shown as wells. They were springs until Sam Bell mined with them and drilled ~~new~~ Horizontal wells there.

page 3-10 prescribed fire  
 I don't know whether you are intended with 1971-72 approval of Sam Bell Burned 49 wash about 49 W. of Mill, also burned from north of at 7 miles or East side of Coosa Creek to about Benito Flat (Yucca Hill or 5000 ft. high).  
 The record of the prescribed fire burning? Both sides of the Coosa River.

- 23-13. Your comment has been noted.
- 23-14. Your comment has been noted and text in Chapter 3 on water wells has been corrected.
- 23-15. Thank you for this information.

Chapter 6: Public Comments and Responses

Letter 23, page 6

to Bureau of Land Management  
Re: Draft for Cienega RMP page 6 of 7

page 3-10 prescribed fire continued

Bell also burned west side of Cienega Creek south of the Cienega Headquarters Buildings.

Bell maintained a large woodcutting operation in the area above areas harvested most of the mature trees killing the stems by above fires and uprooting stumps with a Bell chainsaw. Prior to this time <sup>under</sup> the trees a good carpet of grass composed of ~~locally~~ <sup>locally</sup> ~~perennial~~ <sup>perennial</sup> grasses and annual grasses. The removal of the mature trees in some areas contributed to bare ground <sup>erosion</sup> and invasion of white thorn and other shrubs and weeds. The removal of the mature trees I believe contributed to the wood cypress drainage erosion problems as the ~~some~~ mature trees were removed <sup>also in</sup> this area down to opposite where pump cypress ~~is~~ <sup>is</sup> Cienega Creek.


page 3-49 prime and Unique Farmlands

I believe this lease pertinent information out. He was established the farm on the Cienega Road along Cienega Creek around 1900 and thereafter when the Chickasha Cattle Company acquired the ranch the farm was leased out and operated until approximately 1950. The lease rent for the farm in 1949 was 40 tons of Hay a year. Jack Greenway who acquired the Cienega Road in 1950 did not operate the farm. When Bell ~~to~~ <sup>to</sup> farm Bell, Bell in the 1970's farmed for several years only for the farming company also briefly farmed a portion ~~to~~ <sup>to</sup> for ~~the~~ <sup>the</sup> ~~and~~ <sup>and</sup> ~~maintain~~ <sup>maintain</sup> agricultural water rights.

- 23-16. Thank you for bringing this information to our attention. We have expanded the description of prescribed fire history in Chapter 3 to incorporate this information.
- 23-17. Thank you for bringing this information to our attention. We have expanded the description of Prime and Unique Farmlands in Chapter 3 to incorporate this information.

Chapter 6: Public Comments and Responses

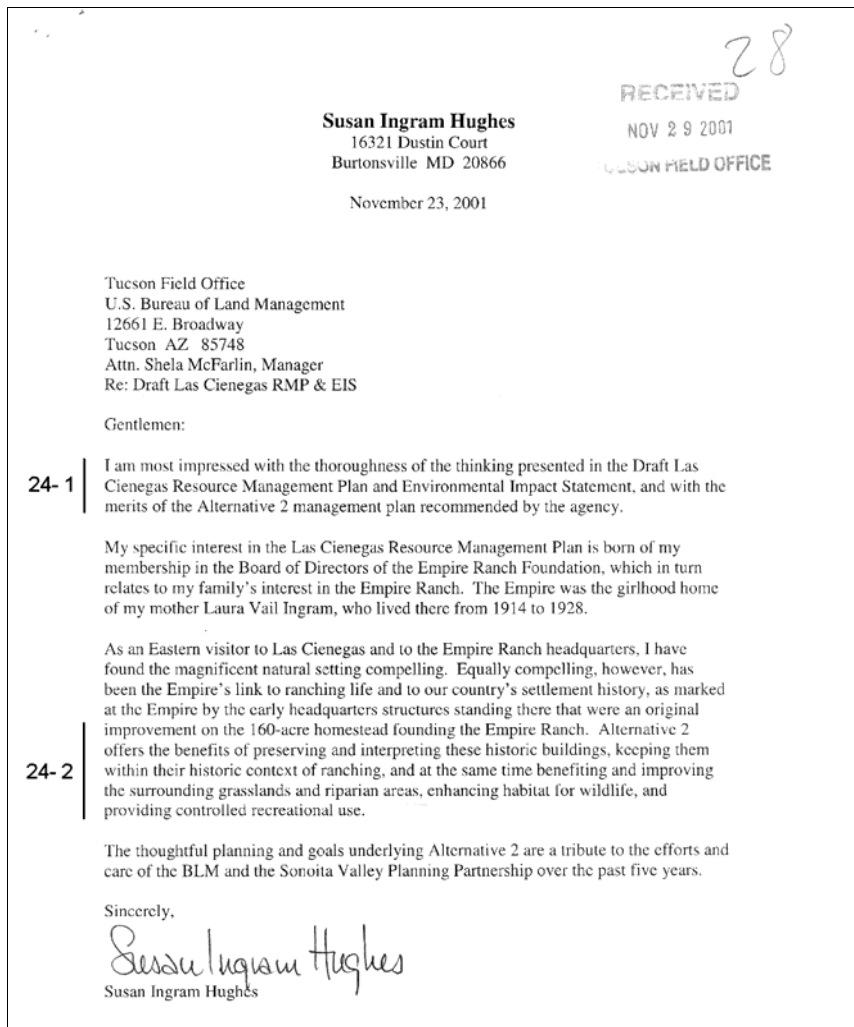
Letter 23, page 7

	<p>to Bureau of Land Management Re. Draft for Congress RMP page 7067</p> <p>Chapter 3 affects Environment, Cultural Resources page 346 second column, second paragraph I believe the adobe Barn was built around 1900. The rest of the building were built around 1930 or before. The frame building at the north end of the shop area was built around 1921 for Harry Heffner or Mary Boice. Frank Boice built the fire search area around 1930 which is the shop.</p>
23-18	
	<p>Chapter 4 Environmental Cooperation Biological Resources page 4-37 second column, proposed protocols were all alternatives as additions to the contract one brought in from other areas, another barn at other places and not <del>located</del> on the ranch. Mexico west of Yuma's game etc could be brought in then stonewall, H. etc. <del>located</del> <del>located at other places</del> said cow manure for a short period could contain said seeds if applicable</p>
23-19	
	<p>re BLM page 4 of 7 * This would apparently be somewhat in line with the state land stocking rate at a cooperative stocking rate. Prior operators paid the regular lease rate <del>and</del> <del>when</del> when for years during drought the <del>rate</del> stocking rate was cut in half and when drought ended gradually brought up to par.</p>
23-12 cont	
	<p>Thank you Gerald W. Korte, 1/12/2001</p> <p>Take note page A5-11 &amp; Am not clear on the RMP mailing list.</p>  <p>Gerald Korte 400 W Linda Vista Blvd Tucson, AZ 85737-6810</p> <p>520-297-3737</p>
23-20	

- 23-18. Harry L. Heffner's letter, dated, "Feb. 5<sup>th</sup>, 1954," to Mrs. Mary Souders, formerly Mrs. Frank Boice, references "...an adobe walled barn, roofed, (where Mr. Vail always kept his top horse and Tom Turner kept his also and of course the wranglers horse)..." Mr. Heffner's letter states that, "All the other buildings at the headquarters including the house you live in and the barn etc in the rear were added when Mr Vail brought Mrs Vail to the Empire as a bride which I think was 1884." A copy of this letter is on file at the Tucson Field Office.
- 23-19. Yes, new livestock or supplemental feed for livestock could be sources of noxious weeds or invasive species.
- 23-20. Your comment has been noted and you have been added to the list of public in Appendix 5.

Chapter 6: Public Comments and Responses

Letter 24

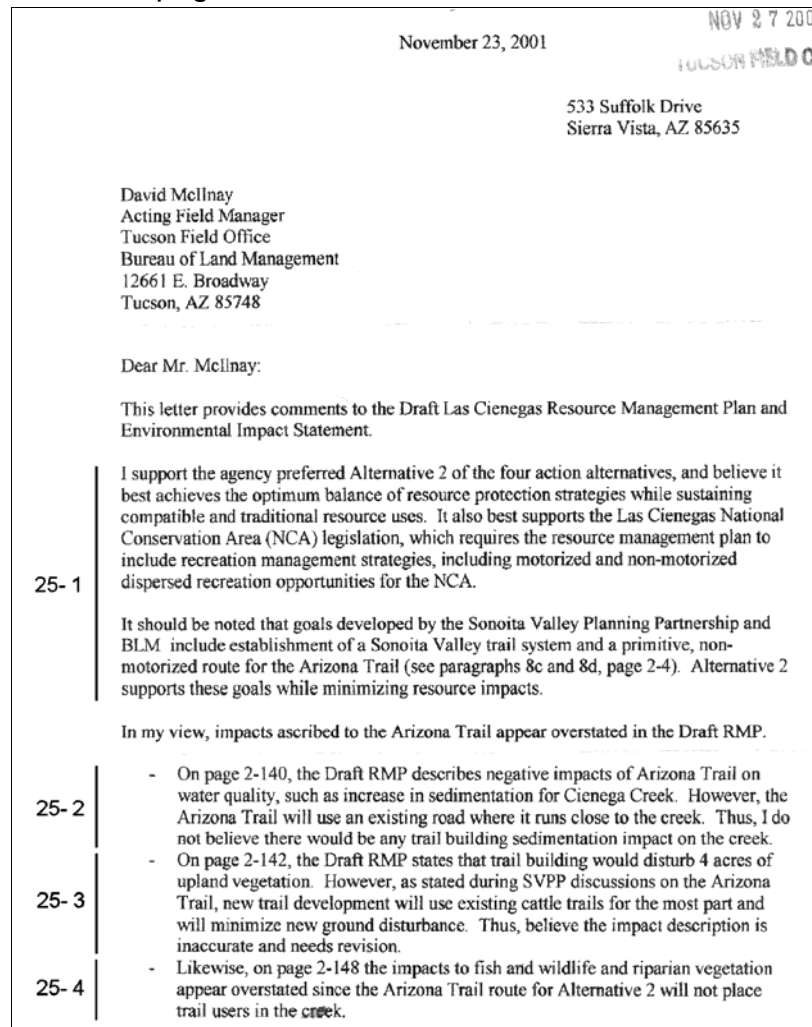


24- 1. Thank You for your comment.

24- 2. Thank You for your comment.

Chapter 6: Public Comments and Responses

Letter 25, page 1



- 25- 1. Your comment has been noted.
- 25- 2. Even with no new trail construction, it is well known that dirt roads and trails are subject to erosion due to a lack of cover and continuous disturbance of the soil surface. Particles that are moved by wind and water will eventually find their way downslope to drainages that eventually discharge into Cienega Creek.
- 25- 3. Even though the proposal is for the Arizona Trail to utilize existing cattle trails and minimize ground disturbance, the exact route of the trail cannot be determined until cultural resource surveys are done and other impacts are assessed. This analysis may result in cattle trails being used infrequently or not all in trail construction. Therefore, the EIS analyzes the worst case scenario when all new trail construction could disturb up to four acres.
- 25- 4. As stated on page 4-42, hikers are likely to leave the corridor of the Arizona Trail to visit Cienega Creek. This activity is likely to be extensive enough to result in small wildcat trails that cause some level of bank disturbance contributing to bank erosion. We acknowledge that the suggestion was made, during SVPP meetings, to incorporate existing cow trails into construction of the Arizona Trail. However these trails typically occur in a pattern radiating

*Chapter 6: Public Comments and Responses*

Letter 25, page 1 (continued)

25- 4. (Cont.)

away from existing livestock water sources and eventually disappear. It is debatable how much utility these livestock trails would serve. Many of these trails may be currently contributing to sediment load and erosion. The addition of heavy horse traffic would exacerbate an already undesirable situation. Wildcat trails would need to be closed and rehabilitated as they are created to prevent impacts from increasing. Four acres is probably an underestimate of the disturbance involved in association with the trail as dispersed camping sites would also be established along the trail and ancillary facilities such as a parking lot, trail heads, corrals and watering points along the route may be required. Although the trail will not be in Cienega Creek, users will inevitably be drawn to the creek because of its proximity to the proposed trail. Under such a situation, impacts to aquatic and riparian habitat due to recreation are highly likely.

Chapter 6: Public Comments and Responses


25- 5 | - On page 2-156, the Draft RMP states the Arizona Trail could disturb cultural resources. However, this statement is not consistent with the statement on page 2-3 which says “BLM will prepare site-specific environmental reviews before implementing actions proposed in this RMP amendment/EIS”. I believe the negative impact on cultural resources will be avoided by the site-specific reviews.

25- 6 | - On page 2-158, the impact of the Arizona Trail is questionable.

25- 7 | - Likewise, on page 2-162 the statement that “increased recreation use would threaten the viability of livestock operations” appears overstated.

25- 8 | In summary, I believe the Draft RMP does a good job in analyzing the various alternatives; however, the impacts of recreation and Arizona Trail appear overly negative in my view. Plus the positive social values of trails and recreation for the user public are not mentioned at all. Recommend BLM re-look these portions of the Draft RMP and develop a more balanced description of trails and recreation impacts, including the positive values offered by outdoor recreation on our public lands.

Thank you for the opportunity to provide these comments.

Sincerely,  
  
Steve Saway

25- 5. The first sentence of the paragraph on page 2-156 of the Draft EIS, which is referenced in your letter, says that, “The Arizona Trail designation could disturb cultural resources by providing non-motorized access into new areas.” This means that the Arizona Trail could provide access into areas where no such trails previously existed, and where cultural resources might be located. The Arizona Trail could in fact serve as a route usable by people disposed to stealing artifacts and looting and vandalizing cultural sites located in these previously inaccessible areas.

In regard to the statement in the second sentence of the paragraph on page 2-156 that “Data recovery could mitigate impacts.” In itself, a site-specific environmental review, would not avoid negative impacts and most importantly does not take the place of a plan to mitigate impacts to cultural sites. The environmental review, as explained on page 2-3 of this EIS, would be documented as part of the NEPA analysis. As explained, “the BLM will ensure that the environmental review process included evaluation of all critical elements, including cultural resources...,” and “...completes required State Historic Preservation Office (SHPO) consultations.” The environmental review ensures that necessary mitigation is provided, which would usually be defined in a mitigation or project plan. Such plans are developed and implemented according to specific criteria stated in BLM

## Chapter 6: Public Comments and Responses

### Letter 25, Page 2 (continued)

25- 5. (continued)

management manuals. And, they are documents separate from site-specific environmental reviews. Mitigation may require a complete, systematic excavation, or data collection, of a cultural site which is considered an impact.

A site-specific environmental review would contain a record of whether cultural resources are known to be or might be present, a professional judgement as to whether they might be impacted, and suggestion/direction as to future, prescribed course of action, including possible mitigation measures, which might be taken to address any perceived impacts. In the context of this discussion, a site specific environmental review might indicate that there are sites located in a previously unaccessed area where a new trail is proposed, and that the new trail could expose those sites to illegal activities. At that point, a recommendation might be made to not allow a trail to be built into this previously unaccessed area. If a single, or several sites, were located directly in the proposed route of a new trail, a recommendation might be made in to reroute the trail so that it would lead around the site(s), thus avoiding direct disturbance and mitigating impacts.

25- 6. Construction of the Arizona Trail across or along legal, existing rights-of-way corridors and land use sites could create serious safety or health hazards for trail users. Existing agreements between the BLM and companies holding legal rights-of-way corridors or permits for special land use do not authorize use of these corridors or land use permit sites to any unauthorized user.

25- 7. If you read further in Table 2-32, (page 2-162 in the draft document), we state that the biological planning process and recreation management actions under Alternative 2 should reduce and resolve recreation and livestock conflicts and improve prospects for maintaining viable grazing operations. Refer to Chapter 4: impacts to livestock grazing from outdoor recreation under Alternative 2 for a more detailed discussion and compare to impacts under Alternative 1.

25- 8. Text has been added to Chapter 2, recreation management actions common to Alternative 2, summarizing dispersed recreation opportunities and restrictions. Text has been added to Chapter 4, Alternative 2 impacts of outdoor recreation management on recreation that describes some of the benefits of recreation management strategies. As management guidance for this RMP, BLM Manual 8320 *Planning for Recreation Resources*, addresses basic recreation issues and benefits. Subsequent studies, university curriculums and other bodies of work recognize, study and evaluate the social, spiritual and health related benefits of recreation. Knowledge and application of recreation management is an important component of this planning document. Careful consideration for compatible recreation opportunities and their management is integrated into this plan. The goal of recreation is to realize satisfying experiences by participating in preferred activities in preferred environmental settings, and a service delivery system which provides suitable, compatible recreation opportunities.




Chapter 6: Public Comments and Responses

Letter 26, page 1

29

TUCSON CONSERVATION CENTER  
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Tucson, Arizona 85719  
(520) 622-3861 Fax (520) 620-1799

  
ARIZONA CHAPTER  
Saving the Last Great Places

PHOENIX CONSERVATION CENTER  
333 East Virginia Avenue, Suite 216  
Phoenix, Arizona 85004  
(602) 712-0048 Fax (602) 712-0059

Ms. Karen Simms, Community Planner  
Bureau of Land Management, Tucson Field Office  
12661 E. Broadway, Tucson, AZ 85748

November 27, 2001

RECEIVED  
NOV 29 2001  
TUCSON FIELD OFFICE


RE: Draft Las Cienegas Resource Management Plan

Dear Ms. Simms:

Enclosed you will find comments from The Nature Conservancy of Arizona regarding the draft Las Cienegas Resource Management Plan. These comments are specific to upland resource management and fire management.

Overall, the intent of our comments are to encourage development of a plan that incorporates the use of fire as an upland vegetation management tool to the maximum degree possible and that is appropriate given ecological and administrative concerns. We are suggesting some modifications that will reflect the current federal emphasis on cross-jurisdictional fire planning and implementation, and provide a basis for expansion of the fire management goals beyond what is currently specified as opportunities develop in the future.

Thank you for providing us the opportunity to comment. Please feel free to contact me at 520-622-3861 extension 3468 should you have any questions regarding these comments.

Sincerely,  
  
Ed Brunson  
Fire Manager, The Nature Conservancy of Arizona

Enc.

Electronic cc: A. Laurenzi, TNC

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Chapter 6: Public Comments and Responses

Letter 26, page 2

Draft Las Cienegas Resource Management Plan and Environmental Impact Statement

Comments submitted by The Nature Conservancy of Arizona

Submitted to the Bureau of Land Management, Tucson Field Office, 12661 East Broadway, Tucson Arizona, 85748

The comments included in this document are limited to the issues of upland resource management and fire management.

The Las Cienegas Resource Management Plan planning area includes land administered by the Bureau of Land Management, the Arizona State Land Department and private property. It also is bounded on multiple sides by property administered by the United States Forest Service. While there are no large communities in the planning area, there are multiple residences that create a Wildland Urban Interface (WUI) situation. This condition is expected to multiply in magnitude as future residential development occurs, and the draft plan indicates that these conditions are a significant limiting factor to the utilization of fire as a vegetation management tool.

The preferred alternative (#2) currently calls for vegetation treatments, including prescribed fire, on 20,000 acres or 14% of the planning area. Regarding planning for prescribed fire, on page 4-8 it is stated that:

"Under alternative 2 BLM would implement an integrated vegetation management treatment strategy to include all the public lands in the planning area. This strategy would also encourage collaboration by adjacent landowners in designing treatments that include suitable State Trust and private lands to create the most logical and economical units possible."

While the current and expected future WUI conditions in the planning area will have limiting effects on the use of fire, it may still be possible through broadly cooperative planning to utilize fire on a larger scale than the 20,000 acres currently identified. Current federal directives encourage the Departments of Interior and Agriculture agencies to work across boundaries in the planning and management of fire and to work with state, local and private interests. This plan can be strengthened by strongly calling for coordinated fire planning between the BLM, Arizona State Land Department and the US Forest Service. Even though there is no Forest Service land within the planning area, there is a definite practical advantage to cooperative planning for prescribed fire in the non WUI areas on the eastern side of the planning area adjacent to the Whetstone Mountains. A statement advocating for coordinated planning also reflects the fact that this should be done concurrently with the USFS Coronado National Forest Plan update that is due to start in the near future. We would encourage the BLM and entire planning team to consider 20,000 acres as a minimum target and indicate in the plan that the administrative support exists for a significantly larger area to be addressed through collaborative processes. This approach will reflect current agency positions on cross-

26- 1

26- 2

26- 1. Your comment has been noted. Coordinated fire planning does occur in many areas between the BLM, Arizona State Land Department, and the U.S. Forest Service and would occur for prescribed fires on Las Cienegas.

26- 2. Your comment has been noted. In the description of vegetation treatments, the text states that additional acres could be considered for treatment based on monitoring, thus more than the proposed initial 20,000 acres could ultimately be treated by prescribed fire.

Chapter 6: Public Comments and Responses

Letter 26, page 3

jurisdictional fire planning and provide a documented basis for pursuing collaborative projects.

We wish to suggest the following modifications to the draft plan.

- Page 2-82. *Management Actions Common to Alternatives 2,3 and 4.* Watershed: Upland, Riparian and Aquatic Area Management Actions.

26- 3

**Insert language that applies to all alternatives. This language states that in non-Wildland Urban Urban Interface areas the BLM will implement an integrated vegetation management strategy. This strategy will include the cooperative planning and implementation of prescribed fire on land within and adjacent to the planning area when it is practical from ecological and administrative standpoints. This collaborative prescribed fire strategy should be developed consistent with the upcoming planning process for the Coronado National Forest.**

26- 4

- Table 2-4, Page 2-16, Wildland Fire Management

**Under Alternative 2, 3 and 4, insert language that reflects the importance of fire as a management tool and the use of a coordinated management approach. For instance: Unplanned wildland fires in the WUI will be suppressed, a multi-agency management strategy that incorporates ecological and administrative issues will be developed for fires outside the WUI.**

26- 5

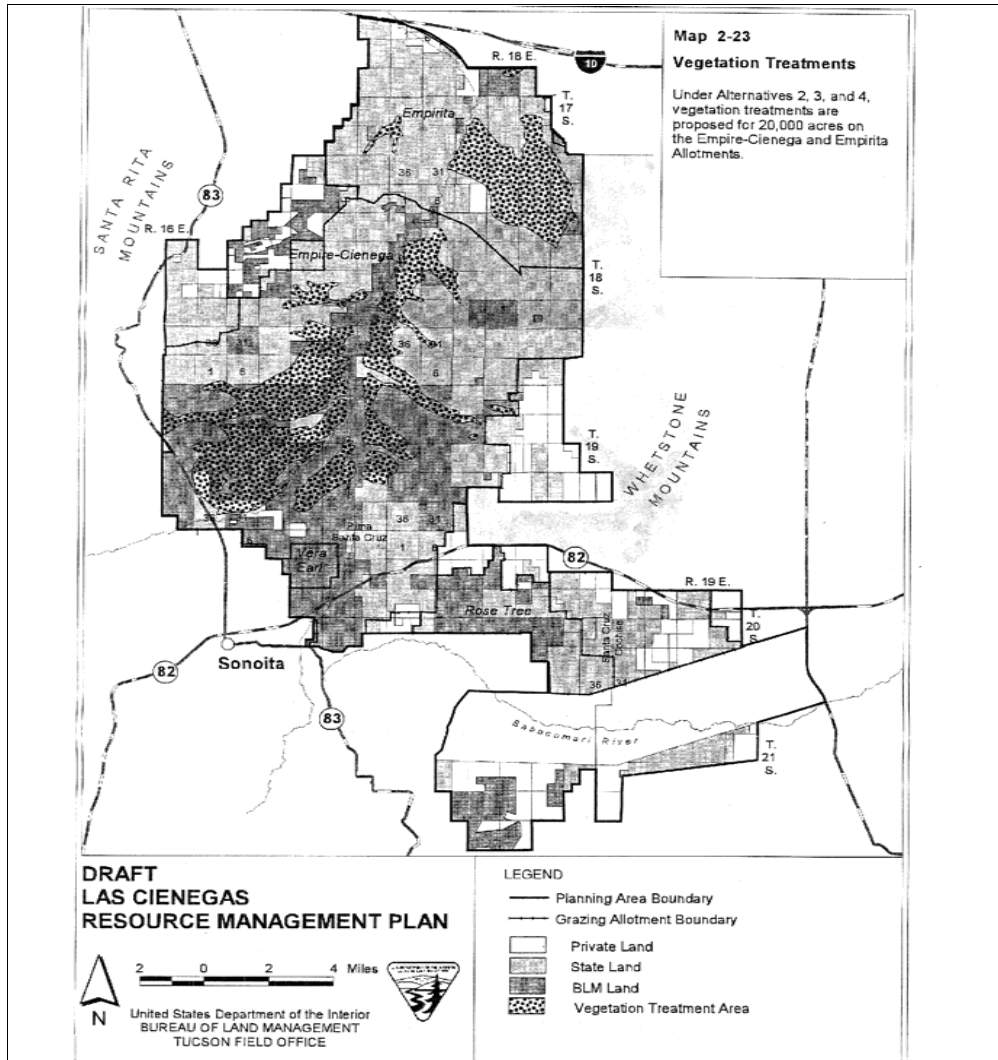
- Map 2-23, Vegetation Treatments.

**Modify this map to show an enlarged potential prescribed fire treatment area to include additional portions of the eastern portion of the planning area. (see attached map)**

26- 3. Your proposed language has been inserted in the document as a watershed action in the management actions common to Alternatives 2, 3, and 4 section.

26- 4. See new language inserted in the document in Table 2-4, wildland fire management and in the wildland fire section of each alternative land use plan.

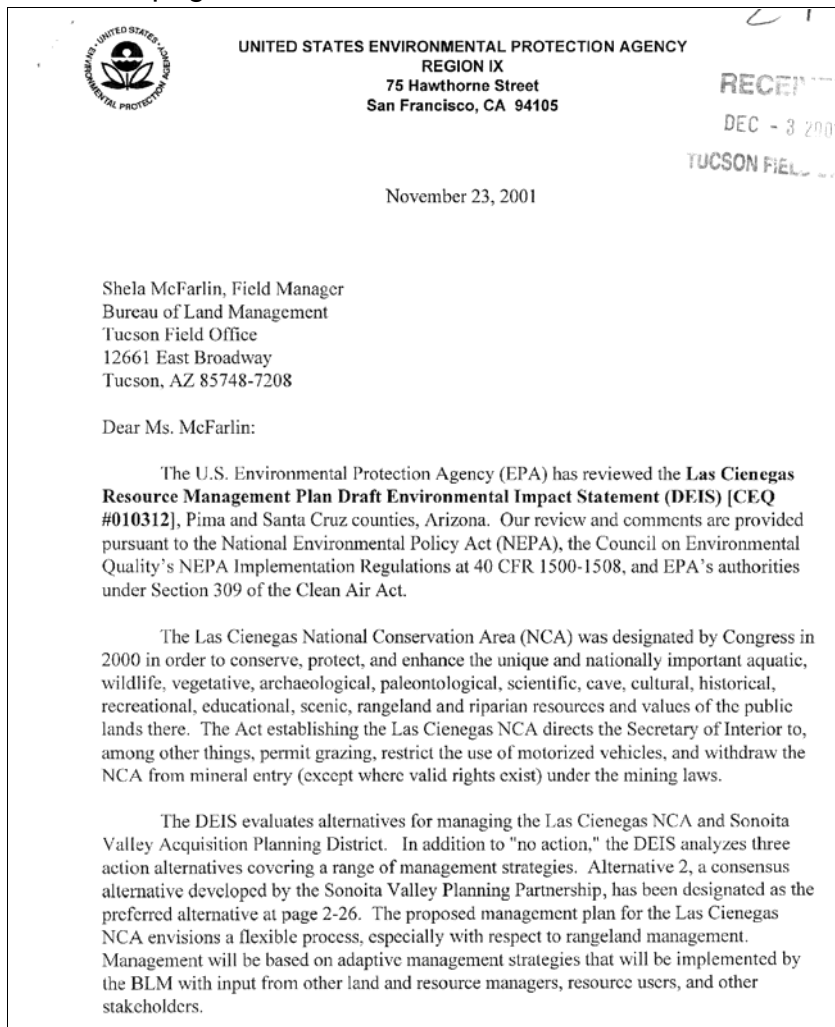
26- 5. Text has been added to Map 2-23 to clarify that an enlarged potential vegetation treatment area (including prescribed fire ) can occur based on coordination with surrounding land managers.



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Chapter 6: Public Comments and Responses

Letter 27, page 1



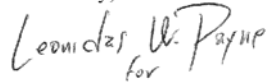
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Chapter 6: Public Comments and Responses

Letter 27, page 2

EPA has assigned a rating of **LO – Lack of Objections** to this DEIS (see enclosed "Summary of Rating Definitions and Follow-Up Action"). We commend the BLM and its planning partners for developing the preferred alternative in a collaborative fashion using an ecosystem approach. We appreciate the opportunity to review this DEIS. Please send a copy of the Final Environmental Impact Statement to this office when it is officially filed with our Washington, D.C., office. If you have any questions, please call me at (415) 972-3854, or call Jeanne Geselbracht at (415) 972-3853.

Sincerely,

Handwritten signature of Leonard W. Payne in cursive script.

Lisa B. Hanf, Manager  
Federal Activities Office

003747

Enclosure: Ratings Summary

27- 1. Thank you for your comment and rating.

## Chapter 6: Public Comments and Responses

### SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

#### ENVIRONMENTAL IMPACT OF THE ACTION

##### *"LO" (Lack of Objections)*

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

##### *"EC" (Environmental Concerns)*

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

##### *"EO" (Environmental Objections)*

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

##### *"EU" (Environmentally Unsatisfactory)*

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

#### ADEQUACY OF THE IMPACT STATEMENT

##### *Category 1" (Adequate)*

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

##### *"Category 2" (Insufficient Information)*

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.


##### *"Category 3" (Inadequate)*

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

\*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

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Chapter 6: Public Comments and Responses

<p>Jane Dee Hull Governor</p> <p>Michael E. Anable State Land Commissioner</p>	<p><b>Arizona</b> <b>State Land Department</b></p> <p>1616 West Adams Street Phoenix, AZ 85007 www.land.state.az.us</p>	
<p>February 20, 2002</p>		
<p>Carl Rountree, Associate Arizona State Director United States Department of the Interior Bureau of Land Management Arizona State Office 222 North Central Avenue Phoenix, Arizona 85004-2203</p>		
<p>RE: Draft Las Cienegas Resource Management Plan</p>		
<p>Dear Mr. Rountree:</p>		
<p>In a recent conversation, you invited the Arizona State Land Department (ASLD) to provide the Bureau of Land Management (BLM) with written comments on the August 2001 draft of <i>Las Cienegas Resource Management Plan and Environmental Impact Statement</i>. In response, please consider the following observations, comments and suggestions.</p>		
<p>Appendix 1 is the Congressional Act which established the Las Cienegas National Conservation Area (NCA) in January 2000. Section 4 of the Act (page A1-3) established the NCA as consisting of 42,000 acres of federal land, while Section 2 (page A1-2) created the Sonoita Valley Acquisition and Planning District (APD). The APD includes the NCA along with some 100,800 acres of predominately State Trust land. As stated in Section 3, the Secretary of the Interior is to negotiate with land owners to acquire lands in the APD for future expansion of the NCA. Of particular relevance to the draft Plan, Section 6 (page A1-4) requires the BLM, within two years of the enactment of the legislation, to develop and implement a comprehensive plan for the long-term management of federal lands within the NCA.</p>		
<p>28-1</p>	<p>Despite the fact that Section 6 gives BLM no authority or responsibility to develop a plan for managing lands in the APD lying outside of the NCA, and despite the statement on page 2-13 that "The proposals under each of the alternatives in this plan are intended to apply only to BLM-managed public lands," it is clear from the numerous maps throughout the draft Plan that BLM has spent considerable effort to plan future uses of State Trust lands outside the NCA, and that the various management alternatives imply or prescribe management of State Trust land. For example:</p>	

28- 1. There are many factors which are considered in determining planning area boundaries including jurisdictional boundaries, distribution of resources and uses across the landscape, and management efficiency. Traditionally RMPs prepared by BLM have covered large geographic areas encompassing several million acres of public lands. In these efforts, there have almost always been intermixed State and/or private lands within the planning boundary. The Las Cienegas RMP, similar to the RMPs being prepared for other NLCS units, covers a smaller geographic area. However, the planning area still includes intermixed State and private lands. The Las Cienegas RMP prescribes management for public lands within the NCA and the Sonoita Valley Acquisition Planning District. This approach ensures both that NCA values and resources are protected, conserved, and enhanced as required by the Act and that values and resources are similarly protected on public lands within the Acquisition Planning District which may be added to the NCA in the future.



Chapter 6: Public Comments and Responses

Letter 28, page 2

Carl Rountree  
February 20, 2002  
Page 2

28- 2 • The draft Plan proposes various alternatives for managing the use of existing roads and trails, not only within the NCA, but throughout the much larger area of adjoining State Trust land. Under these proposals, different segments of existing routes would be conditionally open or closed for various uses. Although the text (page 2-13) recognizes that implementation of these linear management alternatives would require rights-of-way across state land, the maps which illustrate the proposals convey the impression that BLM's management plan would govern the use and non-use of routes across State Trust land. As long as the land is State Trust land, however, those portrayals conflict with the state's underlying authority to control access for recreational, hunting, and other uses.

28- 3 • With regard to Areas of Critical Environmental Concern (ACEC), the text of Alternative 2 (page 2-43) indicates that any State Trust land acquired in the future *would* be incorporated into the ACEC (emphasis added). The corresponding map (Map 2-10), however, shows the proposed ACE boundary as coinciding with the exterior boundary of the entire planning area, thereby including *all* State Trust land in the ACEC. Similarly, Alternative 3 states that 441 acres of public [BLM] land would be designated as the Nogales Springs ACEC (page 2-53), but the corresponding map (Map 2-16) shows the ACEC as also including some five sections of State Trust land.

28- 4 • With regard to mineral uses, Alternative 3 (page 2-47) provides that BLM would not allow surface occupancy or mineral material sales in any ACEC, which as shown in Map 2-11, would include the five sections of State Trust land in the Nogales Springs ACEC.

28- 5 By planning for the future management of State Trust lands outside of the NCA, BLM has exceeded its authority as provided by the legislation which established the NCA. Therefore, ASLD asks that draft Plan be revised to narrow its scope to cover only the NCA. The Plan should also be revised to include a section devoted to a realistic consideration of the means by which BLM intends to compensate the beneficiaries of Arizona's State Land Trust for the Trust lands that are currently within the NCA and for the acquisition of State Trust lands in the APD for future expansion of the NCA.

28- 6

Please call me at 542-4621 if you would like to discuss the revisions which ASLD is suggesting.

Sincerely,

  
Michael E. Anable  
State Land Commissioner

28- 2. The maps which illustrate proposals have been modified to clarify that BLM will not manage State trust lands.

28- 3. The map has been modified to exclude State Trust Land.

28- 4. The map has been modified to exclude 5 sections of State Trust land.

28- 5. Chapters 1 and 2 will highlight text emphasizing that the management proposals are for BLM-managed public land only. ACEC and minerals maps have been corrected where some shading was inadvertently done on State Land. All maps have been reviewed and text added or changed, if necessary, emphasizing that management proposals are for BLM-managed lands only and will only apply to intermixed State Trust Lands if they are acquired.

28- 6. An acquisition strategy has been incorporated into the proposed Las Cienegas RMP. The strategy includes objectives of acquisition, criteria for identifying and prioritizing parcels, and identification of methods available for acquisitions.

# APPENDICES



# **APPENDIX 1**

## **The Act Establishing the Las Cienegas National Conservation Area**

---

One Hundred Sixth Congress  
of the  
United States of America  
AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the twenty-fourth day of January, two thousand  
**An Act**  
To establish the Las Cienegas National Conservation Area in the State of Arizona.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

### **SECTION 1. DEFINITIONS**

For the purposes of this Act, the following definitions apply:

- (1) CONSERVATION AREA - The term `Conservation Area' means the Las Cienegas National Conservation Area established by section 4(a).
- (2) ACQUISITION PLANNING DISTRICT - The term 'Acquisition Planning District' means the Sonoita Valley Acquisition Planning District established by section 2(a).
- (3) MANAGEMENT PLAN - The term `management plan' means the management plan for the Conservation Area.
- (4) PUBLIC LANDS - The term `public lands' has the meaning given the term in section 103(e) of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1702(e)), except that such term shall not include interest in lands not owned by the United States.
- (5) SECRETARY - The term `Secretary' means the Secretary of the Interior.

### **SECTION 2. ESTABLISHMENT OF THE SONOITA VALLEY ACQUISITION PLANNING DISTRICT**

(a) IN GENERAL - In order to provide for future acquisitions of important conservation land within the Sonoita Valley region of the State of Arizona, there is hereby established the Sonoita Valley Acquisition Planning District.

(b) AREAS INCLUDED - The Acquisition Planning District shall consist of approximately 142,800 acres of land in the Arizona counties of Pima and Santa Cruz, including the Conservation Area, as generally depicted on the map entitled 'Sonoita Valley Acquisition Planning District and Las Cienegas National Conservation Area' and dated October 2, 2000.

(c) MAP AND LEGAL DESCRIPTION - As soon as practicable after the date of the enactment of this Act, the Secretary shall submit to Congress a map and legal description of the Acquisition Planning District. In case of a conflict between the map referred to in subsection (b) and the map and legal description submitted by the Secretary, the map referred to in subsection (b) shall control. The map and legal description shall have the same force and effect as if included in this Act, except that the Secretary may correct clerical and typographical errors in such map and legal description. Copies of the map and legal description shall be on file and available for public inspection in the Office of the Director of the Bureau of Land Management, and in the appropriate office of the Bureau of Land Management in Arizona.

### **SECTION 3. PURPOSES OF THE ACQUISITION PLANNING DISTRICT**

(a) IN GENERAL - The Secretary shall negotiate with land owners for the acquisition of lands and interest in lands suitable for Conservation Area expansion that meet the purposes described in section 4(a). The Secretary shall only acquire property under this Act pursuant to section 7.

(b) FEDERAL LANDS - The Secretary, through the Bureau of Land Management, shall administer the public lands within the Acquisition Planning District pursuant to this Act and the applicable provisions of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.), subject to valid existing rights, and in accordance with the management plan. Such public lands shall become part of the Conservation Area when they become contiguous with the Conservation Area.

(c) FISH AND WILDLIFE - Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the State of Arizona with respect to fish and wildlife within the Acquisition Planning District.

(d) PROTECTION OF STATE AND PRIVATE LANDS AND INTERESTS - Nothing in this Act shall be construed as affecting any property rights or management authority with regard to any lands or interest in lands held by the State of Arizona, any political subdivision of the State of Arizona, or any private property rights within the boundaries of the Acquisition Planning District.

(e) PUBLIC LANDS - Nothing in this Act shall be construed as in any way diminishing the Secretary's or the Bureau of Land Management's authorities, rights, or responsibilities for managing the public lands within the Acquisition Planning District.

(f) COORDINATED MANAGEMENT - The Secretary shall coordinate the management of the public lands within the Acquisition Planning District with that of surrounding county, State, and private lands consistent with the provisions of subsection (d).

#### **SECTION 4. ESTABLISHMENT OF THE LAS CIENEGAS NATIONAL CONSERVATION AREA**

(a) **IN GENERAL** - In order to conserve, protect, and enhance for the benefit and enjoyment of present and future generations the unique and nationally important aquatic, wildlife, vegetative, archaeological, paleontological, scientific, cave, cultural, historical, recreational, educational, scenic, rangeland, and riparian resources and values of the public lands described in subsection (b) while allowing livestock grazing and recreation to continue in appropriate areas, there is hereby established the Las Cienegas National Conservation Area in the State of Arizona.

(b) **AREAS INCLUDED** - The Conservation Area shall consist of approximately 42,000 acres of public lands in the Arizona counties of Pima and Santa Cruz, as generally depicted on the map entitled 'Sonoita Valley Acquisition Planning District and Las Cienegas National Conservation Area' and dated October 2, 2000.

(c) **MAPS AND LEGAL DESCRIPTION** - As soon as practicable after the date of the enactment of this Act, the Secretary shall submit to Congress a map and legal description of the Conservation Area. In case of a conflict between the map referred to in subsection (b) and the map and legal description submitted by the Secretary, the map referred to in subsection (b) shall control. The map and legal description shall have the same force and effect as if included in this Act, except that the Secretary may correct clerical and typographical errors in such map and legal description. Copies of the map and legal description shall be on file and available for public inspection in the Office of the Director of the Bureau of Land Management, and in the appropriate office of the Bureau of Land Management in Arizona.

(d) **FOREST LANDS** - Any lands included in the Coronado National Forest that are located within the boundaries of the Conservation Area shall be considered to be a part of the Conservation Area. The Secretary of Agriculture shall revise the boundaries of the Coronado National Forest to reflect the exclusion of such lands from the Coronado National Forest.

#### **SECTION 5. MANAGEMENT OF THE LAS CIENEGAS NATIONAL CONSERVATION AREA**

(a) **IN GENERAL** - The Secretary shall manage the Conservation Area in a manner that conserves, protects, and enhances its resources and values, including the resources and values specified in section 4(a), pursuant to the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.) and other applicable law, including this Act.

(b) **USES** - The Secretary shall allow only such uses of the Conservation Area as the Secretary finds will further the purposes for which the Conservation Area is established as set forth in section 4(a).

(c) **GRAZING** - The Secretary of the Interior shall permit grazing subject to all applicable laws, regulations, and Executive orders consistent with the purposes of this Act.

(d) **MOTORIZED VEHICLES** - Except where needed for administrative purposes or to respond to an emergency, use of motorized vehicles on public lands in the Conservation Area shall be allowed only-- (1) before the effective date of a management plan prepared pursuant to section 6, on roads and trails designated for use of motorized vehicles in the management plan that applies on the date of the enactment of this Act; and (2) after the effective date of a management plan prepared pursuant to section 6, on roads and trails designated for use of motor vehicles in that management plan.

(e) **MILITARY AIRSPACE** - Prior to the date of the enactment of this Act the Federal Aviation Administration approved restricted military airspace (Areas 2303A and 2303B) which covers portions of the Conservation Area. Designation of the Conservation Area shall not impact or impose any altitude, flight, or other airspace restrictions on current or future military operations or missions. Should the military require additional or modified airspace in the future, the Congress does not intend for the designation of the Conservation Area to impede the military from petitioning the Federal Aviation Administration to change or expand existing restricted military airspace.

(f) **ACCESS TO STATE AND PRIVATE LANDS** - Nothing in this Act shall affect valid existing rights-of-way within the Conservation Area. The Secretary shall provide reasonable access to nonfederally owned lands or interest in lands within the boundaries of the Conservation Area.

(g) **HUNTING** - Hunting shall be allowed within the Conservation Area in accordance with applicable laws and regulations of the United States and the State of Arizona, except that the Secretary, after consultation with the Arizona State wildlife management agency, may issue regulations designating zones where and establishing periods when no hunting shall be permitted for reasons of public safety, administration, or public use and enjoyment.

(h) **PREVENTATIVE MEASURES** - Nothing in this Act shall preclude such measures as the Secretary determines necessary to prevent devastating fire or infestation of insects or disease within the Conservation Area.

(i) **NO BUFFER ZONES** - The establishment of the Conservation Area shall not lead to the creation of protective perimeters or buffer zones around the Conservation Area. The fact that there may be activities or uses on lands outside the Conservation Area that would not be permitted in the Conservation Area shall not preclude such activities or uses on such lands up to the boundary of the Conservation Area consistent with other applicable laws.

(j) **WITHDRAWALS** - Subject to valid existing rights all Federal lands within the Conservation Area and all lands and interest therein which are hereafter acquired by the United States are hereby withdrawn from all forms of entry, appropriation, or disposal under the public land laws and from location, entry, and patent under the mining laws, and from operation of the mineral leasing and geothermal leasing laws and all amendments thereto.

## **SECTION 6. MANAGEMENT PLAN**

(a) **PLAN REQUIRED** - Not later than 2 years after the date of the enactment of this Act, the Secretary, through the Bureau of Land Management, shall develop and begin to implement a comprehensive management plan for the long-term management of the public lands within the Conservation Area in order to fulfill the purposes for which it is established, as set forth in section 4(a). Consistent with the provisions of this Act, the management plan shall be developed--(1) in consultation with appropriate departments of the State of Arizona, including wildlife and land management agencies, with full public participation; (2) from the draft Empire-Cienega Ecosystem Management Plan/EIS, dated October 2000, as it applies to Federal lands or lands with conservation easements; and (3) in accordance with the resource goals and objectives developed through the Sonoita Valley Planning Partnership process as incorporated in the draft Empire-Cienega Ecosystem Management Plan/EIS, dated October 2000, giving full consideration to the

management alternative preferred by the Sonoita Valley Planning Partnership, as it applies to Federal lands or lands with conservation easements.

(b) CONTENTS - The management plan shall include--(1) provisions designed to ensure the protection of the resources and values described in section 4(a); (2) an implementation plan for a continuing program of interpretation and public education about the resources and values of the Conservation Area; (3) a proposal for minimal administrative and public facilities to be developed or improved at a level compatible with achieving the resource objectives for the Conservation Area and with the other proposed management activities to accommodate visitors to the Conservation Area; (4) cultural resources management strategies for the Conservation Area, prepared in consultation with appropriate departments of the State of Arizona, with emphasis on the preservation of the resources of the Conservation Area and the interpretive, educational, and long-term scientific uses of these resources, giving priority to the enforcement of the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa et seq.) and the National Historic Preservation Act (16 U.S.C. 470 et seq.) within the Conservation Area; (5) wildlife management strategies for the Conservation Area, prepared in consultation with appropriate departments of the State of Arizona and using previous studies of the Conservation Area; (6) production livestock grazing management strategies, prepared in consultation with appropriate departments of the State of Arizona; (7) provisions designed to ensure the protection of environmentally sustainable livestock use on appropriate lands within the Conservation Area; (8) recreation management strategies, including motorized and nonmotorized dispersed recreation opportunities for the Conservation Area, prepared in consultation with appropriate departments of the State of Arizona; (9) cave resources management strategies prepared in compliance with the goals and objectives of the Federal Cave Resources Protection Act of 1988 (16 U.S.C. 4301 et seq.); and (10) provisions designed to ensure that if a road or trail located on public lands within the Conservation Area, or any portion of such a road or trail, is removed, consideration shall be given to providing similar alternative access to the portion of the Conservation Area serviced by such removed road or trail.

(c) COOPERATIVE AGREEMENTS - In order to better implement the management plan, the Secretary may enter into cooperative agreements with appropriate Federal, State, and local agencies pursuant to section 307(b) of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1737(b)).

(d) RESEARCH ACTIVITIES - In order to assist in the development and implementation of the management plan, the Secretary may authorize appropriate research, including research concerning the environmental, biological, hydrological, cultural, agricultural, recreational, and other characteristics, resources, and values of the Conservation Area, pursuant to section 307(a) of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1737(a)).

## **SECTION 7. LAND ACQUISITION**

(a) IN GENERAL-(1) PRIORITY TO CONSERVATION EASEMENTS - In acquiring lands or interest in lands under this section, the Secretary shall give priority to such acquisitions in the form of conservation easements. (2) PRIVATE LANDS- The Secretary is authorized to acquire privately held lands or interest in lands within the boundaries of the Acquisition Planning District only from a willing seller through donation, exchange, or purchase. (3) COUNTY LANDS- The Secretary is authorized to acquire county lands or interest in lands within the boundaries of the Acquisition Planning District only with the consent of the county through donation, exchange, or purchase. (4) STATE LANDS-(A) IN GENERAL- The Secretary is authorized to acquire lands or interest in lands owned by the State of Arizona located within the boundaries of the Acquisition Planning District only with the consent of the State and in accordance with State law, by

donation, exchange, or purchase. (B) CONSIDERATION- As consideration for the acquisitions by the United States of lands or interest in lands under this paragraph, the Secretary shall pay fair market value for such lands or shall convey to the State of Arizona all or some interest in Federal lands (including buildings and other improvements on such lands or other Federal property other than real property) or any other asset of equal value within the State of Arizona. (C) TRANSFER OF JURISDICTION- All Federal agencies are authorized to transfer jurisdiction of Federal lands or interest in lands (including buildings and other improvements on such lands or other Federal property other than real property) or any other asset within the State of Arizona to the Bureau of Land Management for the purpose of acquiring lands or interest in lands as provided for in this paragraph.

(b) MANAGEMENT OF ACQUIRED LANDS - Lands acquired under this section shall, upon acquisition, become part of the Conservation Area and shall be administered as part of the Conservation Area. These lands shall be managed in accordance with this Act, other applicable laws, and the management plan.

## **SECTION 8. REPORTS TO CONGRESS**

(a) PROTECTION OF CERTAIN LANDS - Not later than 2 years after the date of the enactment of this Act, the Secretary shall submit to Congress a report describing the most effective measures to protect the lands north of the Acquisition Planning District within the Rincon Valley, Colossal Cave area, and Agua Verde Creek corridor north of Interstate 10 to provide an ecological link to Saguaro National Park and the Rincon Mountains and contribute to local government conservation priorities.

(b) IMPLEMENTATION OF THIS ACT - Not later than 5 years after the date of the enactment of this Act, and at least at the end of every 10-year period thereafter, the Secretary shall submit to Congress a report describing the implementation of this Act, the condition of the resources and values of the Conservation Area, and the progress of the Secretary in achieving the purposes for which the Conservation Area is established as set forth in section 4(a).

Speaker of the House of Representatives. Vice President of the United States and President of the Senate.  
Reference: Public Law 106-538 (December 6, 2000)



# APPENDIX 2

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## **1. DESCRIPTION OF MANAGEMENT GUIDANCE COMMON TO ALL ALTERNATIVES**

The following management guidance common to all alternatives summarizes the policies, regulations, and laws that guide and affect the management of public lands and resources for each resource program.

### **WATERSHED MANAGEMENT**

The Federal Land and Policy Act of 1967 (FLPMA) defines BLM's multiple use management mission to include protection of watersheds. FLPMA requires that public lands be managed to protect scientific, environmental, air and atmospheric, and water resources. FLPMA also requires (1) that BLM develop land use plans to guide the management actions on these lands and (2) that land use plans comply with state and federal air, water, and pollution standards.

FLPMA requires compliance with the following laws:

1. Soil Conservation and Domestic Allotment Act of 1935.
2. Watershed Protection and Flood Control Act of 1954.
3. Colorado River Basin Salinity Control Act of 1974.
4. Wild and Scenic Rivers Act of 1968.
5. National Environmental Policy Act of 1969.
6. Federal Pollution Control Act with amendments of 1972.
7. Clean Water Act of 1989.
8. Safe Drinking Water Act of 1977.

The Clean Air Act of 1970 and the 1990 amendments govern air quality. BLM Manual 7000 and executive orders provide field guidance in managing soil, water, and air.

### **SOILS MANAGEMENT**

The common goal of all the alternatives in this resource management plan is to minimize soil erosion and rehabilitate eroded areas to maintain and enhance watershed condition and reduce nonpoint source pollution that could result from rangeland management use and activities.

BLM's current grazing regulations (43CFR part 4000) provide Standards and Guidelines for Rangeland Health. BLM has supplemented regulations to be more responsive to land management in Arizona. These regulations apply to all BLM-administered lands where livestock grazing is permitted. The standards provide objectives that must be achieved for BLM-managed soil, water, and vegetation resources. BLM evaluates activities proposed in erosion-prone areas through the National Environmental Policy Act process to determine expected impacts and mitigating measures needed to abate possible impacts.

## **WATER MANAGEMENT**

BLM's mandate of the water resource program consists of the following:

- To ensure the physical presence and legal availability of water on public lands.
- To ensure that those waters meet or exceed federal and state water quality standards for specific uses.
- To mitigate activities to prevent water quality degradation.

The water resource program is divided into three parts: (1) water inventory (2) water rights, and (3) monitoring.

**Water Inventory:** BLM policy is to inventory all water resources on public lands it administers and to document and store this data in its Water Data Management System.

**Water Rights:** BLM policy is to file for water rights on all water sources on public and acquired lands in accordance with State of Arizona water laws.

**Water Quality:** BLM monitors water quality to assess resource impacts from specific activities and to obtain baseline resource information.

Nonpoint source pollution abatement authority is addressed in Section 319 of the Federal Clean Water Act Amendments of 1987 and the State of Arizona Environmental Quality Act (EQA) of 1986. The Arizona Department of Environmental Quality (ADEQ) is the state agency responsible for nonpoint source water pollution control and abatement. ADEQ annually reports on the status of the water quality and any impaired waters. For more information see the ADEQ - [Arizona Water Quality Assessment: 1998 - 305b Report & Arizona Provisional Water Quality Limited Waters List](#).

## **AIR QUALITY**

The objective of the BLM's air resource program is to maintain or improve air quality within National Ambient Air Quality Standards (NAAQS), achieve State Implementation Plan (SIP) goals for non-attainment areas, reduce emissions from point/non-point sources, and improve BLM's ability to understand and predict the effects of changing climatic regimes and atmospheric conditions that may cause ecological changes in climate-stressed environments.

*Open Areas, Dry Washes, and River Beds:* The control of airborne dust from open areas, dry washes and river beds is addressed in Arizona Rules and Regulations for Air Pollution Control - R9-3-404 A-C.

*Roadways and Streets:* Regulation, R9-3-405 A prohibits the use, repair, building, or rebuilding of roadways without taking reasonable dust abatement measures.

*Mineral Tailings:* R9-3-408 addresses prohibition on permitting or allowing construction of mineral tailings piles.

*Fire Management:* R9-3-402 and 403 direct BLM to follow permitting procedures before conducting any prescribed burning projects, to ensure that smoke from fires does not degrade air quality. Section 118 of the Clean Air Act (49.501 of the Arizona Laws Relating to Environmental Quality) charges the Arizona

Department of Environmental Quality to protect the health and welfare of Arizona residents from adverse impacts of air pollution. Those wishing to conduct prescribed burns must contact the Arizona Department of Environmental Quality.

## **VEGETATION MANAGEMENT**

The Federal Land Policy and Management Act mandates BLM to manage vegetation resources under the principles of multiple use and sustained yield to maintain or improve biological diversity. This planning effort has categorized lands supporting native vegetation communities into two distinct types: (1) rangelands and (2) riparian areas and wetlands.

### **Rangeland Resources**

BLM manages its grazing program under provisions of the Taylor Grazing Act of 1934, the Federal Land Policy and Management Act of 1976, and the Public Rangelands Improvement Act of 1978. These acts, along with Title 43, Code of Federal Regulations Part 4100 and associated BLM manual policy, authorize the following:

- Issuance of grazing permits and leases.
- Detection and abatement of unauthorized use.
- Use supervision.
- Livestock grazing management.
- Range improvement facilities and treatments.

Management of rangelands in the planning area is guided by the Phoenix Resource Management Plan (BLM 1988), the Eastern Arizona Grazing EIS (BLM 1986) and the associated Rangeland Program Summary to the Grazing EIS (BLM 1987b). The Eastern Arizona Grazing EIS provides regulations for managing rangelands and for the livestock grazing program through the following objectives:

- Restore and improve rangeland condition and productivity.
- Provide for use and development of rangeland.
- Maintain and improve habitat and viable wildlife populations.
- Control future management actions.
- Promote sustained yield and multiple use.

### **Riparian and Wetland Resources**

Legal authority for BLM's management of riparian-wetland areas is based on many laws and executive orders, including the following:

- Taylor Grazing Act of 1934.
- Endangered Species Act of 1973.
- Federal Land and Policy Management Act of 1976.
- Emergency Wetland Resources Act of 1986.
- Water Quality Act of 1987.

- Executive Order 11988 (Floodplain Management).
- Executive Order 11990 (Protection of Wetlands).

On January 22, 1987, BLM issued its riparian area management policy, which defined the term riparian area, set management objectives, and outlined specific policy direction. This policy is the basis for BLM Manual 1737 (Riparian-Wetland Area Management), the Bureau-wide Riparian-Wetland Initiative for the 1990's, and the Arizona Riparian-Wetland Area Management Strategy. Riparian management plans will be consistent to the extent practicable, with State of Arizona riparian habitat, protection policy, "Protection of the Riparian Areas" February 14, 1991 (Executive Order 91-6).

### **Invasive Species**

**Executive Order 13112 directs federal agencies to prevent the introduction and spread of invasive species; detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; monitor invasive species populations accurately and reliably; provide for restoration of native species and habitat conditions in ecosystems that have been invaded; conduct research on invasive species and develop technologies to prevent introduction and provide for environ-mentally sound control of invasive species and promote public education on invasive species and the means to address them.**

### **FISH AND WILDLIFE MANAGEMENT**

Legislation, including the Federal Land Policy and Management Act, the Endangered Species Act, Public Rangelands Improvement Act, and the Sikes Act, directs BLM to manage habitats to meet the needs of fish and wildlife.

The Endangered Species Act of 1973 is the authority for conserving endangered and threatened species on public lands. Section 4(f) of this act directs the Secretary of the Interior to develop and implement recovery plans for the conservation and survival of endangered species. Section 7(a)(1) requires each federal agency to carry out proactive measures to recover listed species. Section 7(a)(2) requires each agency to avoid jeopardizing the existence of listed species through its actions.

BLM Manual 6840 does the following:

- Outlines the conservation of threatened and endangered species and the habitat on which they depend.
- Ensures that all actions that BLM authorizes, funds, or implements comply with the Endangered Species Act.
- Requires cooperation with the U.S. Fish and Wildlife Service in the planning and recovery of threatened and endangered species.
- States BLM's policy for special status ~~candidate~~ species.

BLM will use collaborative information and services from state agencies, federal agencies, universities, conservation groups, and organizations for proposals, the implementing of wildlife improvements, or any other wildlife management action. This plan amendment meets Sikes Act (1974) requirements for a wildlife habitat management plan. Section 205 of the National Environmental Policy Act requires interdisciplinary consultation.

## **CULTURAL RESOURCES**

The BLM administers cultural resources according to mandates set forth by a number of regulations, laws and acts, including the Federal Land Policy and Management Act (FLPMA) of 1976, the National Historic Preservation Act (NHPA) of 1966, and the Archaeological Resources Protection Act (ARPA) of 1979.

In Arizona, the BLM also operates under the terms of a national Programmatic Agreement (PA) and a Protocol with the Arizona State Historic Preservation Officer (SHPO). This Protocol guides inventory, data recovery and impact mitigation procedures for cultural resources eligible for listing or listed on the National Register of Historic Places that are affected by BLM undertakings and actions.

The National Historic Preservation Act requires the BLM to inventory and preserve significant cultural properties located on land under its administration. In compliance with this legislation, the BLM's cultural resource management program at the field office level provides for: 1) collection and assimilation of information about the nature of the cultural resources known and expected to occur within the field area, 2) assessment of cultural resource use potentials, 3) assignment of resource uses, 4) planned steps to protect or realize assigned uses, and 5) authorization of appropriate uses.

To comply with the National Historic Preservation Act, activities that may affect properties listed on or eligible for the National Register of Historic Places are evaluated and potential impacts analyzed and mitigated under the terms of BLM's national cultural resources Programmatic Agreement and Arizona Protocol.

The Archaeological Resources Protection Act does the following:

- Prohibits the attempt or excavation, removal, damage, or trafficking of archaeological resources from public land by unauthorized persons.
- Provides for the authorized removal and excavation of cultural resources through a permitting process.
- Requires the Secretary of the Interior to prepare plans to determine the nature and extent of archaeological resources and to schedule land surveys in areas likely to contain the most scientifically valuable archaeological resources.

### **Native American Consultation**

BLM must consult with Native Americans while preparing planning documents such as RMPs to meet its responsibilities under the following:

- Federal Land Policy and Management Act National Environmental Policy Act.
- American Indian Religious Freedom Act.
- Executive Order 13007.

These responsibilities require BLM to inform tribal officials and representatives of opportunities to comment on and participate in developing BLM use plans, specifically (1) requesting their views, (2) asking which people such as tribal leaders or religious practitioners it should contact, and (3) making a good faith effort to pursue those contacts and elicit Native American interests and concerns.

## LIVESTOCK GRAZING

Actions pertaining to livestock grazing management conform to the Eastern Arizona Grazing EIS (BLM 1986), provisions of the Taylor Grazing Act of 1934, and the Public Rangeland Improvement Act of 1978. All proposed grazing and rangeland improvement practices conform to the Best Management Practices developed by the Arizona Department of Environmental Quality for livestock grazing. BLM administers livestock grazing under the 43 CFR 4000 regulations consistent with achieving land use plan objectives.

## MINERAL MANAGEMENT

Overall guidance on managing mineral resources appears in the following:

- General Mining Law of 1872, as amended.
- Mining and Minerals Policy Act of 1970.
- Sec. 102 (a)(12) of the Federal Land Policy and Management Act.
- National Materials and Minerals Policy, Research and Development Act of 1980.
- State of Arizona statutes and rules.
- BLM's Mineral Resources Policy of 1984.

Section ~~3809.2-2~~ **3809.42(b)** of Title 43 Code of Federal Regulations covers concerns for air, water, and solid waste. This regulation requires all operators to comply with state pollution control standards.

*Locatable Minerals:* Development of locatable minerals is regulated by BLM's Surface Management Regulations at 43 CFR 3809. The 3809 regulations require mineral exploration and development under the mining laws to prevent unnecessary or undue degradation of other resources. Mining activities will be evaluated on a case-by-case basis during the life of this plan.

*Saleable Minerals:* The Material Act of 1947 and 43 CFR 3600 provide for the disposal and regulation of mineral materials. BLM will administer the sales of mineral materials to the public on a case-by-case basis.

*Leasable Minerals:* The Mineral Leasing Act of 1920, Geothermal Steam Act of 1970, and 43 CFR 3100 to 3500 provide the regulatory framework for issuing mineral leases. BLM attaches stipulations to leases to protect natural and cultural resources in a lease area.

## HAZARDOUS MATERIALS

BLM manages hazardous materials in compliance with the following statutes:

- Resource Conservation and Recovery Act (RCRA), or Public Law 94-580.
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or Public Law 96-510, also known as the Superfund Act.
- Superfund Amendment Reauthorization Act (SARA) Title III (E.O. 12580).

BLM responsibilities under these acts include conformance with federal RCRA enforcement regulations pertaining to the storage, handling, and disposal of hazardous materials and ~~reporting unpermitted hazardous~~

material discharges **and responding to releases of hazardous substances** under the provisions of CERCLA. The BLM Tucson Field Office hazardous materials specialist and law enforcement will coordinate environmental conditions such as spills or illegal dumping and initiate the proper response.

## **LAND TENURE AND LAND USE AUTHORIZATIONS**

The Land Tenure Amendment to the Safford District Resource Management Plan (BLM 1994c) made land tenure decisions for the Empire-Cienega Planning Area while the planning area was administered by the BLM Safford District. The Empire-Cienega Long Term Management Area was one of 24 long term management areas (LTMA) delineated in the Land Tenure Plan Amendment. The boundaries of the Empire-Cienega LTMA correspond to the current planning area boundary. In managing all 24 LTMA BLM will do the following:

- Intensively manage the public lands for their multiple resource values as defined in the Federal Land Policy and Management Act.
- Retain all public land (surface and subsurface estate) and possibly seek to acquire state and private lands within these areas.
- Consider land acquisitions on a case-by-case basis and consider economic impacts as well as natural resource impacts.

BLM may acquire land by exchange or purchase, considering four alternatives for private lands acquisitions:

- Land owner education.
- Entering into cooperative management agreements.
- Partial acquisition such as conservation easements.
- Full “fee simple title” acquisition.

The following are objectives for land acquisition within LTMA:

- Acquire lands with high public values that compliment existing management programs within long term management areas.
- Consolidate ownership patterns within LTMA to improve management efficiency.
- Improve service to the public.

Lands considered for acquisition will have one or more of the following characteristics:

- Riparian habitat.
- Watersheds of important riparian areas.
- High-value wildlife habitat, including critical habitat for threatened and endangered species and major migration corridors.
- Suitability for an administrative site.
- Suitability for developed recreation sites.
- Access to public lands.
- Significant cultural and paleontological properties.
- Other high public resources, such as inholdings in areas of critical environmental concern and other types of special management areas.



*Land Use Authorizations:* BLM will continue to issue land use authorizations on a case-by-case basis and in accordance with the approved resource management plan. BLM will issue rights-of-way within existing right-of-way routes, including joint use whenever possible.

## **OUTDOOR RECREATION**

**The BLM recognizes the importance of quality outdoor recreation experiences to local economies, as well as to the health and well-being of society and the enjoyment of our visitors. The BLM is committed to managing and protecting the NCA so that the areas and activities which are most important to visitors are still available for years to come.**

**The Land and Water Conservation Fund Act of 1965 is the main authority that assures accessibility to outdoor recreation resources. This act serves as the basis for the objectives of the BLM recreation program:**

- Provide quality outdoor recreation opportunities and experiences.
- Protect visitor health and safety and natural and cultural resources.
- Provide universally accessible facilities.
- Resolve user conflicts.

BLM has determined that segments of Cienega Creek are suitable for inclusion in the Wild and Scenic Rivers System and must be managed by the guidelines of the Wild and Scenic Rivers Act of 1968 during the interim and upon designation by Congress. This act selects certain rivers of the Nation having remarkable values, preserves them in a free-flowing condition, and protects their local environments for the "... benefit and enjoyment of present and future generations."

Commercial recreation uses, special events, and group activities will have to apply for special recreation permits. BLM considers these applications on a case-by-case basis and addresses them under Title 43 CFR, Sub-part 8372 (Special Recreation Permits, Other than on Developed Recreation Site). Other criteria applied to the permits come from the NEPA guidelines. These criteria ensure consistency with management objectives such as the following:

- Suitability.
- Mitigation of potential ground disturbance.
- Amount of traffic generated by the permit.
- Conflict with other uses.

## **2. BLM STANDARDS AND GUIDELINES FOR ACHIEVING RANGELAND HEALTH**

### **BLM Standards and Guidelines for Achieving Rangeland Health**

The goals, objectives, and actions presented in this plan are intended to meet or exceed the standards required in the Bureau's Standards and Guidelines for Rangeland Health in Arizona. These standards and guidelines were developed in consultation with Resource Advisory Council and others. The Arizona standards and guidelines meet the requirements and intent of 43 Code of Federal Regulations, Subpart 4180 (Rangeland Health). These standards and guidelines are intended to provide a clear statement of agency policy and direction for those who use public lands, and for those who are responsible for their management and accountable for their condition.

The Fundamentals of Rangeland Health stated in 43 CFR 4180 are:

1. Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity and the timing and duration of flow.
2. Ecological processes, including the hydrologic cycle, nutrient cycle and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.
3. Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established Bureau of Land Management objectives such as meeting wildlife needs.
4. Habitats are, or are making significant progress toward being, restored or maintained for federal threatened and endangered species, federal Proposed, Category 1 and 2, federal candidate and other special status species.

The fundamentals of rangeland health combine the basic precepts of physical function and biological health with elements of law relating to water quality, and plant and animal populations and communities. They provide the direction for the development of resource objectives and the selection of appropriate management actions to achieve them.

### **ARIZONA STANDARDS AND GUIDELINES**

Arizona Standards and Guidelines (S&G) for grazing administration have been developed through a collaborative process involving the Bureau of Land Management State S&G Team and the Arizona Resource Advisory Council. Together, through meetings, conference calls, correspondence, and Open Houses with the public, the BLM State Team and RAC prepared Standards and Guidelines to address the minimum requirements outlined in the grazing regulations. The Standards and Guidelines, criteria for

meeting Standards, and indicators are an integrated document that conforms to the fundamentals of rangeland health and the requirements of the regulations when taken as a whole.

Upland sites, riparian-wetland areas, and desired resource conditions are each addressed by a standard and associated guidelines.

### **Standard 1: Upland Sites**

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform (ecological site).

#### **Criteria for meeting Standard 1:**

Soil conditions support proper functioning of hydrologic, energy, and nutrient cycles. Many factors interact to maintain stable soils and healthy soil conditions, including appropriate amounts of vegetative cover, litter, and soil porosity and organic matter. Under proper functioning conditions, rates of soil loss and infiltration are consistent with the potential of the site.

Ground cover in the form of plants, litter or rock is present in pattern, kind, and amount sufficient to prevent accelerated erosion for the ecological site; or ground cover is increasing as determined by monitoring over an established period of time.

Signs of accelerated erosion are minimal or diminishing for the ecological site as determined by monitoring over an established period of time.

#### **As indicated by such factors as:**

- Ground Cover
  - litter
  - live vegetation, amount and type (e.g., grass, shrubs, trees, etc.)
  - rock
- Signs of erosion
  - flow pattern
  - gullies
  - rills
  - plant pedestaling

#### **Exceptions and exemptions (where applicable):**

- None

#### **Guidelines:**

1-1. Management activities will maintain or promote ground cover that will provide for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological sites within management units. The ground cover should maintain soil organisms and plants and animals to support

the hydrologic and nutrient cycles, and energy flow. Ground cover and signs of erosion are surrogate measures for hydrologic and nutrient cycles and energy flow.

1-2. When grazing practices alone are not likely to restore areas of low infiltration or permeability, land management treatments may be designed and implemented to attain improvement.

## **Standard 2: Riparian-Wetland Sites**

Riparian-wetland areas are in properly functioning condition.

### **Criteria for meeting Standard 2:**

Stream channel morphology and functions are appropriate for proper functioning condition for existing climate, landform, and channel reach characteristics. Riparian-wetland areas are functioning properly when adequate vegetation, land form, or large woody debris is present to dissipate stream energy associated with high water flows.

Riparian-wetland functioning condition assessments are based on examination of hydrologic, vegetative, soil and erosion-deposition factors. BLM has developed a standard checklist to address these factors and make functional assessments. Riparian-wetland areas are functioning properly as indicated by the results of the application of the appropriate checklist.

The checklist for riparian areas is in Technical Reference 1737-9 "Process for Assessing Proper Functioning Condition." The checklist for wetlands is in Technical Reference 1737-11 "Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas." These checklists are reprinted on the pages following the Guidelines for Standard 3.

### **As indicated by such factors as:**

- Gradient
- Width/depth ratio
- Channel roughness and sinuosity of stream channel
- Bank stabilization
- Reduced erosion
- Captured sediment
- Ground-water recharge
- Dissipation of energy by vegetation

### **Exceptions and exemptions (where applicable):**

- Dirt tanks, wells, and other water facilities constructed or placed at a location for the purpose of providing water for livestock and/or wildlife and which have not been determined through local planning efforts to provide for riparian or wetland habitat are exempt.
- Water impoundments permitted for construction, mining, or other similar activities are exempt.

## **Guidelines:**

2-1. Management practices maintain or promote sufficient vegetation to maintain, improve or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge and stream bank stability, thus promoting stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform.

2-2. New facilities are located away from riparian-wetland areas if they conflict with achieving or maintaining riparian-wetland function. Existing facilities are used in a way that does not conflict with riparian-wetland functions or are relocated or modified when incompatible with riparian-wetland functions.

2-3. The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect ecological functions and processes.

## **Standard 3: Desired Resource Conditions**

Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

### **Criteria for meeting Standard 3:**

Upland and riparian-wetland plant communities meet desired plant community objectives. Plant community objectives are determined with consideration for all multiple uses. Objectives also address native species, and the requirements of the Taylor Grazing Act, Federal Land Policy and Management Act, Endangered Species Act, Clean Water Act, and appropriate laws, regulations, and policies.

Desired plant community objectives will be developed to assure that soil conditions and ecosystem function described in Standards 1 and 2 are met. They detail a site-specific plant community, which when obtained, will assure rangeland health, State water quality standards, and habitat for endangered, threatened, and sensitive species. Thus, desired plant community objectives will be used as an indicator of ecosystem function and rangeland health.

### **As indicated by such factors as:**

- Composition
- Structure
- Distribution

### **Exceptions and exemptions (where applicable):**

- Ecological sites or stream reaches on which a change in existing vegetation is physically, biologically, or economically impractical.

**Guidelines:**

3-1. The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands, non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, and/or (d) cannot compete with already established non-native species.

3-2. Conservation of Federal threatened or endangered, proposed, candidate, and other special status species is promoted by the maintenance or restoration of their habitats.

3-3. Management practices maintain, restore, or enhance water quality in conformance with State or Federal standards.

3-4. Intensity, season and frequency of use, and distribution of grazing use should provide for growth and reproduction of those plant species needed to reach desired plant community objectives.

3-5. Grazing on designated ephemeral (annual and perennial) rangeland may be authorized if the following conditions are met:

- ephemeral vegetation is present in draws, washes, and under shrubs and has grown to useable levels at the time grazing begins;
- sufficient surface and subsurface soil moisture exists for continued plant growth;
- serviceable waters are capable of providing for proper grazing distribution;
- sufficient annual vegetation will remain on site to satisfy other resource concerns, (i.e., watershed, wildlife, wild horses and burros); and
- monitoring is conducted during grazing to determine if objectives are being met.

3-6. Management practices will target those populations of noxious weeds which can be controlled or eliminated by approved methods.

3-7. Management practices to achieve desired plant communities will consider protection and conservation of known cultural resources, including historical sites, and prehistoric sites and plants of significance to Native American peoples.

### 3. RIPARIAN PROPER FUNCTIONING CONDITION ASSESSMENTS

Name of Riparian-Wetland Area (**Lotic Area**): \_\_\_\_\_

Date: \_\_\_\_\_ Area/Segment ID: \_\_\_\_\_ Miles: \_\_\_\_\_

ID Team Observers: \_\_\_\_\_

Yes	No	N/A	HYDROLOGIC
			1) Floodplain inundated in "relatively frequent" events (1-3 years)
			2) Active/stable beaver dams
			3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region)
			4) Riparian zone is widening or has achieved potential extent
			5) Upland watershed not contributing to riparian degradation

Yes	No	N/A	VEGETATIVE
			6) Diverse age-class distribution (recruitment for maintenance/recovery)
			7) Diverse composition of vegetation (for maintenance/recovery)
			8) Species present indicate maintenance or riparian soil moisture characteristics
			9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
			10) Riparian plants exhibit high vigor
			11) Adequate vegetative cover present to protect banks and dissipate energy during high flows
			12) Plant communities in the riparian area are an adequate source of coarse and/or large woody debris

Yes	No	N/A	EROSION DEPOSITION
			13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody debris) adequate to dissipate energy
			14) Point bars are revegetating
			15) Lateral stream movement is associated with natural sinuosity
			16) System is vertically stable
			17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

(Revised 1995)  
Appendix 1-11

**REMARKS (Lotic Checklist)**

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**SUMMARY DETERMINATION**

**Functional Rating:**

Proper Functioning Condition \_\_\_\_\_  
Functional--At Risk \_\_\_\_\_  
Nonfunctional \_\_\_\_\_  
Unknown \_\_\_\_\_

**Trend for Functional--At Risk:**

Upward \_\_\_\_\_  
Downward \_\_\_\_\_  
Not Apparent \_\_\_\_\_

**Are factors contributing to unacceptable conditions outside BLM's control or management?**

Yes \_\_\_\_\_  
No \_\_\_\_\_

**If yes, what are those factors?**

\_\_\_\_ Flow regulations                      \_\_\_\_ Mining activities                      \_\_\_\_ Upstream channel conditions  
\_\_\_\_ Channelization                      \_\_\_\_ Road encroachment                      \_\_\_\_ Oil field water discharge  
\_\_\_\_ Augmented flows                      \_\_\_\_ Other (Specify) \_\_\_\_\_



Name of Riparian-Wetland Area (**Lentic Area**): \_\_\_\_\_

Date: \_\_\_\_\_ Area/Segment ID: \_\_\_\_\_ Acres: \_\_\_\_\_

ID Team Observers: \_\_\_\_\_

Yes	No	N/A	HYDROLOGIC	
			1)	Riparian-wetland area is saturated at or near the surface or inundated in "relatively frequent" events (1-3 years)
			2)	Fluctuation of water levels is not excessive
			3)	Riparian-wetland zone is enlarging or has achieved potential extent
			4)	Upland watershed not contributing to riparian-wetland degradation
			5)	Water quality is sufficient to support riparian-wetland plants
			6)	Natural surface or subsurface flow patterns are not altered by disturbance (i.e., hoof action, dams, dikes, trails, roads, rills, gullies, drilling activities)
			7)	Structure accommodates safe passage of flows (e.g., no headcut effecting dam or spillway)

Yes	No	N/A	VEGETATION	
			8)	Diverse age-class distribution (recruitment for maintenance/recovery)
			9)	Diverse composition of vegetation (for maintenance/recovery)
			10)	Species present indicate maintenance of riparian-wetland soil moisture characteristics
			11)	Vegetation is comprised of those plants or plant communities that have root masses capable of withstanding wind events, wave flow events, or overland flows (e.g., storm events, snowmelt)
			12)	Riparian-wetland plants exhibit high vigor
			13)	Adequate vegetative cover present to protect shorelines/soil surface and dissipate energy during high wind and wave events or overland flows
			14)	Frost or abnormal hydrologic heaving is not present
			15)	Favorable microsite condition (i.e., woody debris, water temperature, etc.) is maintained by adjacent site characteristics

Yes	No	N/A	SOILS-EROSION DEPOSITION	
			16)	Accumulation of chemicals affecting plant productivity/composition is not apparent
			17)	Saturation of soils (i.e., ponding, flooding frequency and duration) is sufficient to compose and maintain hydric soils
			18)	Underlying geologic structure/soil material/permafrost is capable of restricting water percolation
			19)	Riparian wetland is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)
			20)	Islands and shoreline characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate wind and wave event energies

(Revised 1995)

**REMARKS (Lentic Checklist)**

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**SUMMARY DETERMINATION**

**Functional Rating:**

Proper Functioning Condition \_\_\_\_\_  
 Functional--At Risk \_\_\_\_\_  
 Nonfunctional \_\_\_\_\_  
 Unknown \_\_\_\_\_

**Trend for Functional--At Risk:**

Upward \_\_\_\_\_  
 Downward \_\_\_\_\_  
 Not Apparent \_\_\_\_\_

**Are factors contributing to unacceptable conditions outside BLM's control or management?**

Yes \_\_\_\_\_  
 No \_\_\_\_\_

**If yes, what are those factors?**

\_\_\_\_ Dewatering \_\_\_\_\_ Mining activities \_\_\_\_\_ Watershed condition  
 \_\_\_\_ Dredging activities \_\_\_\_\_ Road encroachment \_\_\_\_\_ Land ownership  
 \_\_\_\_ Other (specify) \_\_\_\_\_

## 4. CULTURAL RESOURCE USE CATEGORIES

### CULTURAL RESOURCE MANAGEMENT USE CATEGORIES

The BLM manages cultural resources for their information potential, their public and traditional uses, and to conserve their values for the future.

#### Use Categories

The BLM management system requires field offices to allocate cultural properties known and projected to occur in a planning area to appropriate use categories. Use categories establish what cultural resources and values need to be protected, and when or how use should be authorized. Cultural resources can be used in a variety of ways, including research, traditional or ceremonial purposes, interpretive exhibits, educational field schools, experimental studies, and as resources “banks” to be conserved for future use.

Ideally, allocations are made in regional plans, local interdisciplinary plans, or project plans. When allocations have not been made in other planning decisions they should be made during the compliance process for land use authorizations. Allocation of use categories should be consistent with historic context documents and State Historic Preservation Plans. These categories are: 1) Scientific Use, 2) Conservation for Future Use, 3) Traditional Use, 4) Public Use, 5) Experimental Use, and, 6) Discharged from Management.

1. **Scientific Use.** This category applies to any cultural property determined to be available for consideration as the subject of scientific or historical study at the present time, using currently available research techniques. Study includes methods that would result in the property's physical alteration or destruction. This category applies almost entirely to prehistoric and historic archaeological properties, where the method of use is generally archaeological excavation, controlled surface collection and/or controlled, systematic data recovery.
2. **Conservation for Future Use.** Allocation to this category is reserved for any unusual cultural property which, because of scarcity, a research potential that surpasses the current state of the art, singular historic importance, cultural importance, architectural interest, or comparable reasons, is not currently available for consideration as the subject of scientific or historical study that would result in its physical alteration. A cultural property included in this category is deemed worthy of segregation from all other land or resource uses, including cultural resource uses, that would threaten the maintenance of its present condition or setting, as pertinent, and will remain in this use category until specified provisions are met in the future.
3. **Traditional Use.** A cultural resource known to be perceived by a specified social and/or cultural group as important in maintaining the cultural identity, heritage, or well-being of the group may be allocated to this use. Cultural properties assigned to this category are to be managed in ways that recognize the importance ascribed to them and seek to accommodate their continuing traditional use.
4. **Public Use.** A cultural property found to be appropriate for use as an interpretive exhibit in place, or for related educational and recreational uses by members of the general public may be allocated for

public use. This category may also include buildings suitable for continued use or adaptive use, for example as staff housing or administrative facilities at a visitor contact or interpretive site.

5. Experimental Use. This category may be applied to a cultural property judged well-suited for controlled experimental study, to be conducted by BLM or others concerned with the techniques of managing cultural properties, which would result in the property's alteration, possibly including loss of integrity and destruction of physical elements. Committing cultural properties or the data they contain to loss must be justified in terms of specific information that would be gained and how it would aid in the management of other cultural properties. **Cultural properties with strong research potential, traditional cultural importance, or good public use potential are not assigned to this category.**

6. Discharged From Management. Cultural properties that have no remaining identifiable use are assigned to this category. Most often this category involves prehistoric and historic archaeological properties, such as small surface scatters or artifacts or debris, whose limited research potential is effectively exhausted as soon as they have been documented. Also, more complex archaeological properties that have had their salient information collected and preserved through mitigation or research may be discharged from management, as should cultural properties destroyed by any natural event or human activity. Properties discharged from management remain in the inventory, but are removed from further management attention and do not constrain other land uses. Particular classes of unrecorded cultural properties may be named and described in advance as dischargeable upon documentation, but specific cultural properties must be inspected in the field and recorded before they may be discharged from management.

## **CULTURAL RESOURCE USE CATEGORIES AND NATIONAL REGISTER SIGNIFICANCE**

Cultural resource use categories are based in part upon requirements stated in the National Historic Preservation Act. This legislation requires the BLM to assess cultural properties to determine their historic significance, integrity and potential for listing on the National Register of Historic Places, and identify possible effects that any undertakings might have on cultural properties eligible for listing or listed on the National Register.

To be considered eligible for listing on the National Register a property must meet three broad qualifications: 1) Generally, it must be at least fifty (50) years old, 2) it must have significance, or embody recognizable importance and, 3) it must retain historic integrity.

A property may embody one or more of several different types of values which represent the importance of a property and imply the reason that it should be preserved. These values are classified under the four National Register Criteria for Evaluation:

Criterion A: Event. Properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history.

Criterion B: Person. Properties may be eligible for listing on the National Register if they are associated with the lives of persons significant in our past.

Criterion C: Design/Construction. Properties may be eligible for the National Register if they embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

Criterion D: Information Potential. Properties may be eligible for the National Register if they have yielded, or may be likely to yield, information important in prehistory or history.

## **CULTURAL RESOURCE USE CATEGORIES- LAS CIENEGAS RESOURCE MANAGEMENT PLAN**

### **Cultural Resources Allocated to Public Use**

#### *Empire Ranch Headquarters*

The land use proposals and implementation plans for cultural resources presented in Chapter 2 include allocation of the historically significant buildings at the Empire Ranch Headquarters to Public Use under all alternatives. If feasible, selected sites or properties outside the headquarters area could be allocated to Public Use in the future under Alternatives 2 and 3, but only if funds and staff are available to ensure that no adverse impacts would occur from such use.

Properties allocated to Public Use may be used as in-place interpretive exhibits, for related educational and recreational uses by members of the general public, and for continued or adaptive use such as staff housing, or administrative facilities at a visitor contact or interpretive site.

#### *Cultural Properties Outside the Empire Ranch Headquarters*

Archaeologists understand very little about the origin, technology, lifestyle and day-to-day activities of the prehistoric people who lived in what is now the planning area. Much of what is understood is based on archaeological materials recovered from two sites in the Cienega Valley that were excavated during the 1950's and 1980's. Since 1988, when the BLM acquired the land making up the planning area, Class III cultural resource inventories have slowly added information to the data base. Similarly, historical information about the planning area is being gradually accumulated.

In the future, as more information is collected, analyzed and available for use in constructing management strategies, sites of various types and ages could be selected and developed for interpreting educational information to the public about the prehistoric and historic people who inhabited the planning area. Provisions could be made to allocate some properties from Scientific Use to Public Use. Interpretation could range from merely placing interpretive panels or kiosks near or at selected sites to developing specific properties for visitation by the public. Such development could include interpretive trails, displays, signs and guided tours. When needed, archaeological efforts at the sites could be designed to include participation of volunteers working under the guidance of professional archaeologists. The object would be to provide information to the general public, and educational opportunities to lay people who wish to be actively involved in archaeology.

### **Cultural Resources Allocated to Scientific Use**

The land use proposals and implementation plans for cultural resources presented in Chapter 2 provide for allocation of the Matty Canyon site complex, Sandford Homestead site and the Pump Canyon site to Scientific Use under Alternatives 2, 3, and 4. Under this use, these properties would be available for scientific and historical study by qualified researchers and scholars. Scientific study of these sites could include archaeological excavation, controlled surface collection, or some type of controlled systematic data recovery. All such data collection would require submission of detailed research proposals conforming to Federal and State standards and requirements. Individual project efforts would be designed to disturb only a small portion of a respective site, leaving undisturbed materials for future study.

As information is compiled through future cultural resource surveys and study of currently documented sites, additional properties may be allocated to Scientific Use.

### **Cultural Resources Allocated to Traditional Use**

Representatives of the Tohono O'odham Nation, San Carlos Apache Tribe, and the Hopi Tribe have stated their interests in noncommercial collection of bear grass, cottonwood root, acorns and several species of medicinal/ceremonial herbs. Collection of these plants and materials would be carried out in a manner that would not kill individual plants or deplete individual populations.

### **Cultural Resources Allocated to Experimental Use or Discharged from Management**

As data are collected and added to the existing body of information about the cultural resources in the planning area, some properties may be allocated for future conservation, experimental use or discharged from management.

## **CULTURAL RESOURCE USE CATEGORIES AND CORRESPONDING MANAGEMENT OBJECTIVES**

Cultural resource management objectives are established through consideration of use categories and may be defined in a regional land use plan, a local land use plan, or a Cultural Resource Project Plan (CRPP). A CRPP documents the type, significance, eligibility status, preservation and protection needs and the uses prescribed for a particular site or group of sites.

A Historic Structures Report (HSR) was written by the National Park Service, under a contract by the BLM, for the Empire Ranch House and the Ranch Hand's House. The Empire Ranch House is listed on the National Register of Historic Places and the surrounding historic buildings are considered eligible for listing. These HSR's provide preservation prescriptions for both structures and are being used as guides for stabilization/preservation currently underway through an agreement between the BLM and Empire Ranch Foundation. This work is being done to meet preservation requirements mandated by the National Historic Preservation Act. A CRPP has been written for the Empire Ranch House. CRPP's will be written for the other historic buildings at the ranch headquarters as well as other selected cultural resources in the planning area.

## 5. VISUAL RESOURCE MANAGEMENT CLASS OBJECTIVES

Bureau Manual 8410, Visual Resource Inventory (BLM 1986), places the management of visual resources (scenic values) into four management classes.

**Class 1** - The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes but does not preclude very limited management activity. The level of change of the characteristic landscape should be very low and must not attract attention.

**Class 2** - The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

**Class 3** - The objective of this class is to partially retain the existing character of the landscape. The level of activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

**Class 4** - The objective of this class is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. Every attempt should be made, however, to minimize the impact of these activities through careful location, minimal disturbance and repeating the basic elements.

## 6. AREAS OF CRITICAL ENVIRONMENTAL CONCERN EVALUATIONS

ACEC nominations were submitted to BLM for Cienega Creek by the Nature Conservancy, the Arizona Game and Fish Department, and Jeff Williamson. The Cienega Creek proposals were modified through the Sonoita Valley Planning Process into two alternatives. The first alternative is the Empire-Cienega ACEC, which includes all public lands within the Empire-Cienega Planning Area except for the public lands now within the Appleton-Whittell ACEC. The Appleton-Whittell would remain a separate ACEC. The second alternative is the Cienega Creek ACEC, which includes a smaller area of public lands surrounding the perennial length of Cienega Creek. An additional proposal for an ACEC including Nogales and Little Nogales Springs was also evaluated. The Empire-Cienega ACEC proposal has been included in Planning Alternatives 2 and 4 and the Cienega Creek ACEC and Nogales Springs ACEC proposals have been included in Planning Alternative 3.

### EMPIRE-CIENEGA ACEC (ALTERNATIVES 2 AND 4)

The Empire-Cienega Planning Area appears to meet the importance and relevance criteria needed to become eligible as an Area of Critical Environmental Concern. The proposed Empire-Cienega ACEC includes all public lands within the Empire-Cienega Planning Boundary (Map 2-10) with the exception of public lands currently within the Appleton-Whittell ACEC (the Research Ranch). The proposed Empire-Cienega ACEC includes the entire perennial portion of Cienega Creek, perennial segments of Empire Gulch, Gardner Canyon, Mattie Canyon, and numerous perennial springs including Nogales and Little Nogales Springs. Also included are some outstanding examples of rare mesquite bosque, sacaton grasslands, and desert grasslands.

**Relevance.** The proposed Empire-Cienega ACEC includes a variety of unique and rare vegetative communities including cottonwood-willow riparian areas, cienegas, mesquite bosques, sacaton grasslands, desert grasslands, and oak woodlands. These communities support a diverse assemblage of plants and animals, many of which are federally listed or identified as species of special concern.

Cienega Creek is the main drainage of the proposed Empire-Cienega ACEC. The 20+ mile riparian zone supports a variety of obligate species, including several federally listed species and many species proposed for state species of special concern.

Cienega Creek provides essential habitat for the Gila topminnow, a federal endangered and proposed state species of special concern. The creek is listed number one for protection by the desert fisheries recovery team and is designated as one of five critical habitats needed for the future survival of the Gila topminnow. The stream is one of the last in Arizona supporting an intact native fish fauna uncontaminated by exotic fish. Cienega Creek also provides habitat for the Gila chub, which is candidate for federal listing. Other special status species found along the creek that require riparian habitat include the Huachuca water umbel, Mexican garter snake, lowland leopard frog, Chiricahua leopard frog, yellow-billed cuckoo, and Southwest willow flycatcher. Sacaton grasslands along Cienega Creek support populations of the rare Botteri's sparrow. Special management is needed to protect and enhance the resources of Cienega Creek. A rigorous monitoring program for native fish populations is needed to



detect any threats to their survival, such as contamination of Cienega Creek by exotic fish. The number of residences and stock ponds in the watershed poses a constant threat of such contamination, and monitoring will allow for timely management actions should such a contamination occur.

The upland areas in the proposed Empire-Cienega ACEC are integral to the health of the watershed and to Cienega Creek and its tributaries. The desert grasslands are some of the finest examples of native grasslands and support populations of the rare grasshopper sparrow and Baird's sparrow as well as herds of pronghorn, mule deer, and white-tail deer. The semidesert grasslands include agave habitats, which provide foraging areas for the lesser long-nosed bat, a federal endangered species.

Soils on terraces adjacent to incised perennial reaches of Cienega Creek and intermittent incised drainages are unstable and represent a natural hazard. These soils have the potential to pipe (internally erode) and headcut. Soils that exhibit these characteristics are found as components in soil mapping units 16a and 27a. Both the soil piping and headcutting processes supply large amounts of sediment to the Cienega Creek system. These sediments may impact native fish habitats. Special Management is needed to reduce sediment from these areas and protect public safety.

**Importance.** The proposed Empire-Cienega ACEC includes five of the rarest habitat types in the American Southwest. The marsh communities found along Cienega Creek have national significance as some of the last, best examples of relatively intact cienegas. Until the late 1800's cienega communities were relatively common components of southwestern riparian systems. Over the last 100 years, the majority of cienegas have disappeared due to declining water tables, channel erosion, and conversion to agriculture (See Hendrickson and Minckley 1985, *Desert Plants* 6(3): 130-175). The cottonwood-willow riparian community along Cienega Creek and its tributaries is considered the rarest forest type in the United States based upon studies conducted by The Nature Conservancy. Special management is needed to ensure the perpetuation and protection of these wetlands. The sacaton-predominated native grassland occurs in the floodplains adjacent to the riparian areas and is one of the largest, intact tracts remaining in the Southwest, hosting many declining avian grassland species. Large mesquite bosques, a rare woodland community, also occur adjacent to the riparian areas of Cienega Creek. The upland areas include large expanses of high-quality native semi-desert grasslands.

The native fish habitats in the perennial flows of Cienega Creek are vulnerable to degradation from adverse land and water management practices. The loss of surface flows in Cienega Creek would jeopardize not only the populations of native fish, including the endangered Gila topminnow, but habitat for a variety of riparian-dependent wildlife species.

Both Chiricahua leopard frogs and lowland leopard frogs, species of special concern, have been found throughout the Cienega Creek watershed at several locations. The leopard frog complex is of special concern in Arizona due to documented reductions as a result of reduction in wetland habitats, air pollution, and predation by introduced bullfrogs.

The natural resource values of Cienega Creek are dependent on the continued surface flow of water in the creek. As residential and agricultural development occurs in Sonoita; competing demands for water may threaten the surface flow. The acquisition and monitoring of instream flow water rights is needed to protect the riparian community.

The Empire-Cienega Resource Conservation Area has recently been designated as a Continentally Important Bird Area by the American Bird Conservancy.

Unstable soils that pipe and headcut pose significant threat to human life and safety in areas where roads exist. The process of soil piping or internal erosion is characterized initially by cracks or depressions on the surface. These features evolve into large sinkholes, which can occur both at the surface or underground within the soil profile. In areas adjacent to incised channels, surface flows enter the soil through the soil, water moves laterally in the soil and exits into the incised channels. As this process occurs large sinkholes have the potential to form at the surface or within the soil. These sinkholes become a safety hazard when they form under existing roads. The soil material above these sinkholes may collapse due to vehicle use and natural processes.

**Goals.** Protect and enhance watershed, grassland, and threatened/endangered wildlife resources, emphasizing total ecosystem management. Reduce the safety hazard caused by areas of unstable soils and reduce the amount of sediment production from these areas.

### **Objectives**

1. Resolve non-federal land use conflicts.
2. Maintain adequate instream flows to support aquatic and riparian resources.
3. Maintain water quality to support aquatic, riparian and fish and wildlife values.
4. Maintain or improve riparian condition to meet objectives for *Proper functioning Condition (PFC)*, T/E fish and wildlife, including but not limited to a combination of maintenance of adequate woody species regeneration, promotion of mixed-aged stands of woody species, promotion of mature cottonwood overstory, and maintenance of cienega habitats.
5. Maintain or improve upland condition to meet objectives for proper functioning condition and desired future conditions of uplands **(maintain or improve ecological site similarity to potential natural community)**.
6. Minimize surface disturbance and erosion through adequate controls on recreational activities, livestock grazing and other human uses.
7. Educate the public regarding riparian and threatened/endangered wildlife issues and management needs.
8. Promote the recovery of the Gila Topminnow.
9. Increase stability in the soil piping and headcutting areas.
10. Maintain or improve water quality in the Cienega Creek system.
11. Stabilize incised channel banks within these unstable soil areas.
12. Reduce surface disturbance and vehicle use within these areas of soil piping and headcutting.
13. Increase public safety.
14. **Prevent the introduction of and control non-native invasive species in the ACEC.**

### **Management Prescriptions**

1. Propose designation of about 49,000 acres of land as an ACEC.
2. Acquire non-federal lands within the ACEC boundaries and incorporate these acquired lands as part of the ACEC.
3. Acquire water rights including instream flow rights for Cienega Creek sufficient to support aquatic fish and wildlife resources and riparian and aquatic habitats..
4. Do not open ACEC to mineral entry and do not permit mineral material sales or surface occupancy for oil and gas leases within the ACEC.
5. Limit motorized vehicles to designated roads and close non-essential roads.
6. Minimize building of recreation and livestock developments in the 100- year flood plain. Limit developments to those that are needed to reduce impacts on riparian areas within the ACEC.

7. Limit livestock use in riparian areas of the ACEC except for crossing lanes, watering areas and specific areas where livestock grazing is identified and used as a management tool to achieve a riparian or aquatic related resource objective.
8. Implement a livestock grazing system consistent with the goals and objectives of the ACEC.
9. Prohibit recreational gold-panning, dredging, or sluicing within the ACEC.
10. Prohibit overnight camping within the riparian areas of the ACEC (defined as within 100 feet of the water's edge). Camping within the 100 year floodplain would be permitted if consistent with management prescriptions for the remainder of the planning area.
11. Limit crossings of Cienega Creek for group activities to dry crossings, established road/trail crossings, or at the designated crossings identified in Figure 2-2 (Alternative 2) and Figure 2-7 (Alternative 4).
12. Develop educational brochures and signs promoting public awareness of threatened and endangered fish and wildlife and riparian resources and their needs.
13. Introduce Gila topminnow from Cienega Creek into available habitats (as fully protected) to provide a refugia for the Cienega Creek population.
14. Include the ACEC in a right-of-way avoidance area. Access routes for maintenance of existing and future utility lines will not cross perennial reaches of Cienega Creek except at designated crossings.
15. Implement the Wood Canyon Watershed Activity Plan (BLM 1989) by doing the following:
  - Find and monitor sinkholes and headcutting areas.
  - Close to vehicular traffic areas that exhibit a high degree of soil piping and headcutting.
  - In these unstable areas relocate existing and future roads away from incised channels.
  - Reduce the amounts of overland flows reaching these unstable areas by diverting flows or increasing vegetative cover in adjacent areas.
  - Stabilize and rehabilitate shallow incised channels to reduce lateral flow by structural or vegetative methods.
  - Stabilize incised channel banks with increased riparian vegetation where possible.
  - Decrease the depth of intermittent incised channels through structural methods to retain sediments.
16. Coordinate with surrounding land owners and managers, including the Forest Service, Arizona State Land Department, and Pima and Santa Cruz Counties to maintain or improve linkages of undeveloped lands in the region.
17. Coordinate with the Forest Service through the Forest Plan Revision process to consider related designations such as research natural areas for adjacent lands such as the western Whetstone Mountains area.
18. Implement a vegetation treatment program to aid in restoration of biological resources and processes.

### **CIENEGA CREEK ACEC (ALTERNATIVE 3)**

Cienega Creek appears to meet the importance and relevance criteria needed to become eligible as an area of critical environmental concern. The proposed Cienega Creek ACEC (Map 2-16) includes the entire perennial portion of Cienega Creek and perennial reaches of Gardner Canyon, Empire Gulch, and Mattie Canyon. Also included are mesquite bosque and sacaton grasslands adjacent to the riparian. The proposed ACEC is located in:

#### **T18S R18E, Sections 6 and 7**

**T18S R17E Sections 12, 13, 14, 23, 24, 26, 27, 34, and 35**

**T19S R17E, Sections 2, 3, 9, 10, 11, 14, 15, 16, 21, 22, 23, 26, 27, 28, 29, 32, 34**

**T20S R17E, Sections 2, 3, 10, and 11**

**Relevance.** Cienega Creek provides essential habitat for the Gila topminnow, a federal endangered and proposed state wildlife of special concern species. The creek is listed number one for protection by the Desert Fisheries Recovery Team and is designated as one of five critical habitats needed for the future survival of the Gila topminnow. The stream is one of the last in Arizona supporting an intact native fish fauna that is uncontaminated by exotic fish. Cienega Creek also provides habitat for the Gila chub, which is a candidate for federal listing. Other species of concern found along the creek that require riparian habitat include the Mexican garter snake, lowland leopard frog, yellow-billed cuckoo, and Southwest willow flycatcher.

Special management is needed to protect and enhance the resources of Cienega Creek. A rigorous monitoring program for native fish populations is needed to detect any threats to their survival such as contamination of Cienega Creek by exotic fishes. The number of residences and stock ponds in the watershed pose a constant threat of such contamination. Monitoring will allow for timely management actions should exotic fish contaminate Cienega Creek.

Soils on terraces adjacent to incised perennial reaches of Cienega Creek and intermittent incised drainages are unstable and represent a natural hazard. These soils have the potential to pipe (internally erode) and head cut. Soils with these characteristics are found as components in soil mapping units 16a and 27a. Both soil piping and headcutting supply large amounts of sediment to the Cienega Creek system. These sediments may degrade native fish habitats. Special management is needed to reduce sediment from these areas and protect public safety.

**Importance.** The proposed Empire-Cienega ACEC includes four of the rarest habitat types in the American Southwest. The marsh communities along Cienega Creek have national significance as some of the last, best examples of relatively intact cienegas. Until the late 1800s cienega communities were relatively common components of southwestern riparian systems. Over the last 100 years, most cienegas have disappeared due to declining water tables, channel erosion, and conversion to agriculture (See Hendrickson and Minckley 1984). The cottonwood-willow riparian community along Cienega Creek and its tributaries is considered the rarest forest type in the United States according to studies conducted by The Nature Conservancy. Special management is needed to ensure the perpetuation and protection of these wetlands. The sacaton-predominated native grassland grows in the floodplains next to the riparian areas. One of the largest, intact tracts remaining in the Southwest, this grassland hosts many declining avian grassland species. Large mesquite bosques, a rare woodland community, also grow next to the riparian areas of Cienega Creek.

The native fish habitats in the perennial flows of Cienega Creek are vulnerable to degradation from adverse land and water management practices. The loss of surface flows in Cienega Creek would jeopardize not only the populations of native fishes, including the endangered Gila topminnow, but habitat for a variety of riparian-dependent wildlife species.

Both Chiricahua leopard frogs and lowland leopard frogs, species of special concern, have been found throughout the Cienega Creek watershed at several locations. The leopard frog complex is of special concern in Arizona due to documented decline as a result of reduced wetland habitats, air pollution, and predation by introduced bullfrogs.

The natural resources of Cienega Creek depend on the creek's continued surface flow of water. As Sonoita undergoes residential and agricultural, competing demands for water may threaten the surface flow. Instream flow water rights must be acquired and monitored to protect the riparian community.

Unstable soils that pipe and head cut significantly threaten human life and safety in areas that have roads. The process of soil piping or internal erosion is characterized initially by cracks or depressions on the surface. These features evolve into large sinkholes, either at the surface or underground within the soil profile. In areas next to incised channels, surface flows soak into the soil, move sideways, and exit into the incised channels. Through this process large sinkholes can form at the surface or within the soil. These sinkholes become hazardous when they form under roads and soil material above them collapse due to vehicle use and natural processes.

**Goal.** Protect and enhance aquatic, riparian, and associated threatened and endangered wildlife species, emphasizing total ecosystem management.

### **Objectives**

1. Resolve nonfederal land use conflicts.
2. Maintain adequate instream flows to support aquatic and riparian resources.
3. Maintain water quality to support aquatic, riparian, and fish and wildlife values.
4. Maintain or improve riparian condition to meet goals for proper functioning condition (*PFC*) and threatened and endangered fish and wildlife, including a combination of the following:
  - Maintaining adequate woody species regeneration.
  - Promoting mixed-aged stands of woody species.
  - Promoting mature cottonwood overstory.
  - Maintaining cienega habitats.
5. Minimize surface disturbance and erosion through adequate controls on recreational activities, livestock grazing, and other human uses.
6. Educate the public on riparian and threatened and endangered wildlife issues and management needs.
7. Promote the recovery of the Gila topminnow.
8. Increase stability in the soil piping and headcutting areas.
9. Maintain or improve water quality in the Cienega Creek system.
10. Stabilize incised channel banks within these unstable soil areas.
11. Reduce surface disturbance and vehicle use within these areas of soil piping and headcutting.
12. Increase public safety.

### **Management Prescriptions**

1. Propose designation of 4,418 acres as an area of critical environmental concern (ACEC).
2. Acquire non-federal lands within the ACEC boundaries and incorporate acquired lands into the ACEC.
3. Acquire water rights including instream flow rights for Cienega Creek sufficient to support aquatic fish and wildlife resources and riparian and aquatic habitats. .
4. Keep the ACEC closed to mineral entry, and do not permit mineral material sales or surface occupancy for oil and gas leases within the ACEC.
5. Limit motorized vehicles to designated roads and close nonessential roads.
6. Minimize building of recreation and livestock developments in the 100-year floodplain. Limit developments to those needed to reduce impacts on riparian areas within the ACEC.
7. Limit livestock use in riparian areas of the ACEC except for crossing lanes, watering areas, and specific areas where livestock grazing is recognized and used as a management tool to achieve a riparian or aquatic-related resource objective.
8. Implement a livestock grazing system consistent with the ACEC's goals and objectives.
9. Prohibit recreational gold panning, dredging, or sluicing within the ACEC.

10. Prohibit camping within the riparian areas of the ACEC (defined as within 100 feet of the water's edge). Permit camping within the 100-year floodplain if consistent with management prescriptions for the remainder of the planning area.
11. Limit crossings of Cienega Creek for group activities to dry crossings, established road or trail crossings, or designated wet crossings shown in Figure 2-5.
12. Develop educational brochures and signs promoting public awareness of threatened/endangered fish and wildlife and riparian resources and their needs.
13. Introduce Gila topminnow from Cienega Creek into available habitats (as fully protected) to provide refugia for the Cienega Creek population.
14. Include the ACEC in a right-of-way avoidance area. Prohibit access routes for maintaining existing and future utility lines from crossing perennial reaches of Cienega Creek except at designated crossings.
15. Implement the existing Wood Canyon Watershed Activity Plan by doing the following:
  - Find and monitor sinkholes and headcutting areas.
  - Close areas that exhibit a high degree of soil piping and headcutting to vehicular traffic.
  - Relocate existing and future roads in these unstable areas away from incised channels.
  - Reduce the amounts of overland flows reaching these unstable areas by diverting flows and increasing vegetative cover in adjacent areas.
  - Stabilize and rehabilitate shallow incised channels to reduce lateral flow by structural or vegetative methods.
  - Stabilize incised channel banks with increased riparian vegetation where possible.
  - Decrease the depth of intermittent incised channels by structural methods to retain sediments.

**Note: A proposal for a Cienega Creek Soil Piping and Headcutting ACEC was incorporated into the proposals for The Empire-Cienega ACEC and the Cienega Creek ACEC.**

### **Nogales Springs ACEC (ALTERNATIVE 3)**

The Nogales and Little Nogales springs area appears to meet the importance and relevance criteria needed to become eligible as an area of critical environmental concern. The proposed Nogales Springs ACEC (Map 2-16) includes the entire block of public land surrounding Nogales and Little Nogales springs. The proposed ACEC is located in area:

**T17S R18E, Sections 22, 26, 27, 28, 34, and 35**  
**T18S, R18E, Sections 2, 3, and 11**

**Relevance.** Nogales and Little Nogales springs provide important refugia habitat for the Cienega Creek population of the Gila topminnow, a federally endangered species. This fish has been reintroduced at these springs, which still have potential to support a successful topminnow reintroduction. Other springs on State Trust Lands in the upper Wakefield Canyon drainage also have potential as topminnow reintroduction sites. The Desert Fisheries Recovery Team has listed the Cienega Creek population as number one for protection, and Cienega Creek has been designated as one of five critical habitats the future survival of the Gila topminnow. Nogales and Little Nogales springs also provide habitat for the lowland leopard frog, a former federal candidate species, which is on the Arizona Game and Fish Department's proposed list of Wildlife of Special Concern.

Special management is needed to protect and enhance the resources of Nogales and Little Nogales springs. Recreational activities and livestock grazing must be restricted to protect these resources.

**Importance.** The native fish and amphibian habitats dependent on the perennial flows of Nogales and Little Nogales Springs are vulnerable to degradation from adverse land and water management practices. The loss of surface flows in Nogales and Little Nogales springs would eliminate this site as a refugium for the Cienega Creek Gila topminnow population and would also cause a loss of habitat for a variety of riparian-dependent wildlife species.

The leopard frog complex is of special concern in Arizona due to documented declines as a result of reduced wetland habitats, air pollution, and predation by introduced bullfrogs.

The natural resource values of Nogales and Little Nogales springs depend on the continued surface flow of water at the springs. With residential and agricultural development in areas surrounding the planning area, competing demands for water may threaten the surface flow. Instream flow water rights need to be acquired and monitored to protect the riparian community. Nogales and Little Nogales springs support a mature riparian forest and diverse and abundant wildlife, including lowland leopard frogs. Mule deer, white-tail deer, and javelina frequent the area. The Nogales and Little Nogales springs complex is within the Empirita ranch. Special management is needed for this area to balance resource protection and needs of the livestock operation.

Travertine is being deposited at the springs. Their waters emerge from limestone, which provides a geologic environment suitable for forming travertine deposits. Travertine results from the precipitation of calcium carbonates from spring waters. The travertine deposits form ledges that can create dams and deep pools.

**Goals.** Protect and enhance the riparian and wildlife resources, emphasizing biological diversity and endangered species recovery. Protect the unique travertine geological processes and features.

### **Objectives**

1. Maintain adequate flow at Nogales and Little Nogales springs to support aquatic and riparian resources.
2. Maintain water quality at Nogales and Little Nogales springs to support aquatic and riparian resources.
3. Maintain or improve riparian condition to meet goals for threatened and endangered wildlife, including maintaining adequate woody species regeneration and promoting mixed-aged stands of woody species.
4. Minimize surface disturbance and erosion by adequately controlling recreational activities, livestock grazing, and other human uses.
5. Promote the recovery of the Gila topminnow.
6. Protect the travertine features and travertine-forming processes from activities that would alter the natural cycle.

### **Management Prescriptions**

1. Propose designating 411 acres of public land as an area of critical environmental concern (ACEC).
2. Maintain existing water rights and obtain enough instream flow water rights to Nogales and Little Nogales springs to support aquatic fish and wildlife and riparian and aquatic habitats.
3. Acquire nonfederal lands within the ACEC and incorporate these acquired lands as part of the ACEC.
4. Close the riparian areas within the ACEC to vehicular travel. Limit motorized vehicles to designated roads and close nonessential roads.

5. Keep the ACEC closed to mineral entry and do not permit mineral material sales or surface occupancy for oil and gas leases within the ACEC.
6. Minimize building of recreation and livestock developments in the 100- year floodplain. Limit developments to those needed to reduce impacts on riparian areas within the ACEC.
7. Limit livestock use in riparian areas of the ACEC except for crossing lanes, watering areas, and areas where livestock grazing is recognized and used as a management tool to achieve a riparian or aquatic-related resource objective.
8. Implement a livestock grazing system consistent with the goals and objectives of the ACEC, including building of fencing and waters needed under (7).
9. Prohibit recreational gold panning, dredging, or sluicing within the ACEC.
10. Prohibit collection of mineral specimens within the ACEC.
11. Prohibit camping within the ACEC's riparian areas defined as within 100 feet of the water's edge). Permit camping within the 100-year floodplain if consistent with management prescriptions for the rest of the planning area.
12. Limit group activity crossings of perennial streams to dry crossings, established road and trail crossings, or at the designated crossings shown in Figure 2-5.
13. Develop educational brochures and signs promoting public awareness of threatened and endangered fish and wildlife and riparian resources and their needs.
14. Introduce Gila topminnow from Cienega Creek into available habitats (as fully protected) to provide a refugium for the Cienega Creek population.
15. Include the ACEC in a right-of-way avoidance area. Do not allow access routes for maintenance of existing and future utility lines to cross perennial stream reaches except at designated crossings.



## **7. LAS CIENEGAS ACQUISITION STRATEGY**

### **Purpose and Need**

The Sonoita Valley Acquisition Planning District (APD) was designated in the Act establishing Las Cienegas National Conservation Area (NCA) in order to provide for future acquisitions of important conservation land within the Sonoita Valley region of the State of Arizona. The Sonoita Valley APD consists of approximately 142,800 acres of land in the Pima and Santa Cruz Counties, including the 47,000 acre NCA (see Map 1-2).

The Las Cienegas NCA Act directs that “The Secretary shall negotiate with land owners for the acquisition of lands and interest in lands suitable for Conservation Area expansion that meet the purposes described in section 4(a)” (of the Act). The Secretary shall only acquire property under this Act pursuant to section 7 (of the Act)”. The Act requires that acquisitions of lands or interest in lands be from willing sellers only.

The BLM is directed to administer the public lands within the Sonoita Valley APD pursuant to the Act and the applicable provisions of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.), subject to valid existing rights, and in accordance with the management plan. Public lands within the Sonoita Valley APD shall become part of the Conservation Area when they become contiguous with the Conservation Area. Management of the public lands within the Sonoita Valley APD is to be coordinated with that of surrounding county, State, and private lands consistent with the provisions of subsection 3(d) of the Act.

### **Objectives of the Las Cienegas NCA Acquisition Strategy**

Las Cienegas NCA was established to conserve, protect, and enhance for the benefit and enjoyment of present and future generations the unique and nationally important aquatic, wildlife, vegetative, archaeological, paleontological, scientific, cave, cultural, historical, recreational, educational, scenic, rangeland, and riparian resources and values of the public lands while allowing livestock grazing and recreation to continue in appropriate areas.

The objectives of the Las Cienegas NCA acquisition strategy are the following:

1. Consolidate land ownership within the NCA boundary to better conserve, protect, and enhance the values and resources for which the NCA was established, to provide for livestock grazing and recreation in appropriate areas, and to improve overall management efficiency.
2. Acquire lands or interest in lands from willing sellers within the Sonoita Valley APD that meet the purposes of the NCA, for inclusion or potential future inclusion into the NCA.
- c. Coordinate with interested parties on acquisitions through the Sonoita Valley Planning Partnership (SVPP) process to ensure accordance with SVPP developed resource goals and objectives and with the management plan.

## Acquisition Criteria

Lands considered for Acquisition within the NCA and Sonoita Valley APD boundaries will be prioritized based on consideration of the following criteria including values, uses and issues:

### 1. *What are the resource values and uses of the lands?*

#### Criteria

- Riparian areas (streams and wetlands).
- Watersheds of important riparian areas.
- Rare plant communities.
- High-value wildlife habitat, including important habitat for threatened and endangered species and major linkage areas that provide for wildlife movements.
- Significant cultural and paleontological properties.
- Areas with high visual quality.
- High-value for dispersed recreation opportunities.
- High-value rangelands that support livestock grazing operations.
- Presence of well sites or other water sources.
- Lands that will maintain or provide legal access to public lands.
- Lands previously proposed for some type of protective designation.

### 2. *What is the risk of development?*

#### Criteria

- Proximity to large urban area.
- Proximity to major highways.
- Proximity to other developing areas.
- Knowledge that land owner is planning to sell property.

### 3. *Where is the land located?*

#### Criteria

- NCA inholding
- Within Sonoita Valley APD and contiguous with NCA boundary (where acquisition will add it to NCA).
- Within Sonoita Valley APD but not contiguous with NCA boundary.
- Within the Section 8 lands (north of Interstate Highway 10).

### 4. *What is the size of the parcel?*

#### Criteria

- How large is the parcel?
- In general, acquiring large parcels is more feasible and cost-effective than acquiring small parcels.

## Potential Priority Acquisition Blocks Based on Above Criteria

Based on the criteria listed above, the following priority blocks of land were identified as potential acquisition priorities:

- Undeveloped in-holdings within the NCA.
- Undeveloped lands contiguous to the NCA
- Lands connecting the NCA to other protected lands.
- Lands supporting several of the resource values/uses for which the NCA was established.

A subsequent strategy will be prepared between BLM, Arizona State Land Department, and other interested publics to identify specific timeframes and priorities for acquisitions.

## Acquisition Methods Available

This strategy addresses both acquisitions of lands and acquisitions of interests in lands through conservation easements. In general, the BLM may acquire lands or conservation easements through purchase, exchange or donation. The Las Cienegas NCA Act further directs that all acquisitions shall be from willing sellers only.

Guidance for acquisitions within the Empire-Cienega planning area, which encompasses all of the Sonoita Valley APD plus additional lands in the valley, comes from two sources. The Las Cienegas NCA Act provides direction for acquisitions within the NCA and Sonoita Valley APD boundaries. Prior to designation of Las Cienegas NCA and Sonoita Valley APD, the source of management direction for acquisitions within the Empire-Cienega planning area was the 1994 land tenure amendment to the Safford Resource Management Plan. The land tenure amendment will continue to provide direction for any acquisitions of lands within the Empire-Cienega planning area that are outside the Sonoita Valley APD .

## Acquisition Methods from Las Cienegas NCA Act:

Section 7 of the Las Cienegas NCA Act covers acquisitions of land and interests in land within the Sonoita Valley APD. Section 8 of the Act covers required reports to Congress including a report identifying protective measures for lands north of Interstate Highway 10 (referred to as Section 8 lands). The following is a summary of those sections:

### *Section 7 - Land Acquisitions*

#### (a) In General -

(1) Priority to Conservation Easements - In acquiring lands or interest in lands under this section, the Secretary shall give priority to such acquisitions in the form of conservation easements.

(2) Private Lands - The Secretary is authorized to acquire privately held lands or interest in lands within the boundaries of the Acquisition Planning District only from a willing seller through donation, exchange, or purchase.

(3) County Lands - The Secretary is authorized to acquire county lands or interest in lands within the boundaries of the Acquisition Planning District only with the consent of the county through donation, exchange, or purchase.

#### (4) State Lands-

(A) In General - The Secretary is authorized to acquire lands or interest in lands owned by the State of Arizona located within the boundaries of the Acquisition Planning District only with the consent of the State and in accordance with State law, by donation, exchange, or purchase.

(B) Consideration- As consideration for the acquisitions by the United States of lands or interest in lands under this paragraph, the Secretary shall pay fair market value for such lands or shall convey to the State of Arizona all or some interest in Federal lands (including buildings and other improvements on such lands or other Federal property other than real property) or any other asset of equal value within the State of Arizona.

(C) Transfer of Jurisdiction- All Federal agencies are authorized to transfer jurisdiction of Federal lands or interest in lands (including buildings and other improvements on such lands or other Federal property other than real property) or any other asset within the State of Arizona to the Bureau of Land Management for the purpose of acquiring lands or interest in lands as provided for in this paragraph.

(b) Management of Acquired Lands - Lands acquired under this section shall, upon acquisition, become part of the Conservation Area and shall be administered as part of the Conservation Area. These lands shall be managed in accordance with this Act, other applicable laws, and the management plan.

#### *Summary of Section 8. Reports To Congress, Subsection (a).*

Section 8(a) of the Las Cienegas NCA Act recognized that not only were the lands within the boundary of the NCA important but that lands outside its boundary possessed unique and valuable qualities as well. The Act requires that within two years the Secretary of the Interior provide Congress with a report that describes the resource values and most effective protection measures for lands north of the Sonoita Valley APD within the Rincon Valley, Colossal Cave area, and Agua Verde Creek corridor north of Interstate 10 to provide an ecological link to Saguaro National Park and the Rincon Mountains and contribute to local government priorities. The report is currently being drafted. The report will identify protective measures for Section 8 lands which potentially may include guidance for and recommendations concerning some form of acquisitions of Section 8 lands by the BLM and/or other entities.

#### Acquisition Methods From the Safford RMP Land Tenure Amendment:

The Land Tenure Amendment to the Safford District Resource Management Plan (BLM 1994c) made land tenure decisions for the Empire-Cienega planning area. The Empire-Cienega Long Term Management Area was one of 24 long term management areas (LTMA) delineated in the land tenure plan amendment. The boundaries of the Empire-Cienega LTMA correspond to the planning area boundary in the draft and final Las Cienegas RMP/EIS. The decisions in the land tenure plan amendment have been incorporated into both the draft and final Las Cienegas RMP and are common to all alternatives. The Las Cienegas NCA Act now provides guidance for acquisitions within Las Cienegas NCA and the Sonoita Valley APD. However, some of the lands in the planning area are not inside either the NCA or the Sonoita Valley APD boundaries, and so guidance for any acquisitions of those lands

continue to be covered by the Safford RMP land tenure amendment. The Safford RMP land tenure amendment identifies acquisition methods, objectives for land acquisition within the LTMA and identifies desired characteristics for lands to be acquired.

#### Acquisitions using Land and Water Conservation Fund Act

The Land and Water Conservation Fund (LWCF) Act was established 3 September 1964 by Public Law 88-578, as amended. Effective 1 January 1965, authorized through FY1989 and reauthorized through FY2015 by the Omnibus Budget Reconciliation Act of 1987.

"The purposes of this Act are to assist in preserving, developing and assuring accessibility to all citizens of the United States of America of present and future generations and visitors who are lawfully present within the boundaries of the United States of America such quality and quantity of outdoor recreation resources as may be available and are necessary and desirable for individual active participation in such recreation and to strengthen the health and vitality of the citizens of the United States by: (1) Providing funds for and authorizing Federal assistance to *States* in planning acquisition, and development of needed land and water areas and facilities and (2) Providing funds for the *Federal*; acquisition and development of certain lands and other areas." More than 90% (if not all) of annual allocations over the past 10 years have been appropriated to the Federal "side" of the program. LWCF is a funding authority. LWCF is not an acquisition authority. The Federal Land Policy Management Act (FLPMA) is the authority under which BLM acquires property.

The 1964 legislation provided for acquisition of lands, waters, or interests in lands within exterior boundaries of: National Forest System Including Recreation Areas (administered by USDA), National Park System, National Scenic Trails, National Wild and Scenic Rivers System, National Wilderness Preservation System, and National Wildlife Refuge System. However, no mention was made of BLM or public lands. A 1989 amendment to the LWCF Act expanded to further define "eligible projects" to include BLM and acquisitions of lands, waters and interests in land within or adjacent to existing areas for conservation and recreation purposes such as: National Conservation Areas, National Recreation Areas, National Historic Trails, National Wilderness Areas. The 1989 amendment to the Act also included planning designations such as Area of Critical Environmental Concern (ACEC), Riparian Areas (RA) and Special Recreation Management Areas (SRMA). The Land and Water Conservation Fund was established for two primary purposes, Open Space and Recreation.

Conservation goals are accomplished by purchase, exchange, donation and condemnation (only for access and under special authority).

The LWCF funding **cannot** be used to develop property (improvements), manage property, manage conservation easements, acquire administrative sites, acquire property from State government (or instrumentalities thereof) [ARIZONA exception], acquire property not identified for perpetual retention (i.e. fee, easement), condemn (except for access or special authority).

#### Acquisitions through Federal Land Transaction Facilitation Act (FLTFA) (aka BACA Bill)

The Federal Land Transaction Facilitation Act (FLTFA) of 2000, P.L. 106-248, was enacted on 9/25/2000. FLTFA does the following:

1. Reaffirms BLM's authorities to sell and exchange public lands under FLPMA but does not amend the substantive provisions of FLPMA relating to disposals and sales.

2. Allows proceeds to be used for acquisitions of inholdings and lands with exceptional resources.
3. Limits Disposals to lands identified for disposal in approved land use plans as of July 25, 2000.
4. Imposes administrative requirements on Secretary to:
  - a. Identify inholdings.
  - b. Prioritize acquisitions of inholdings.
  - c. Complete Sections 205 and 206 appraisals and other legal requirements.

Under FLTFA, BLM can (1) sell public land and use the money for purchases of other lands to benefit BLM or other Federal agencies; (2) use up to 20% of the sale money to cover administrative costs; (3) use up to 80% of the non-administrative dollars within the same state as the property that was sold; (4) use the money to purchase inholdings in Federally designated areas which are any lands within special designated areas managed by BLM and also includes lands within units of the Park Service, Forest Service, USFWS, Wild and Scenic River System, National Trail System, Wilderness or WSA.

Sales are to be conducted under the authority of FLPMA Section 203 and the criteria in the sale regulations (43 CFR 2710). The law does NOT apply to disposal of minerals under section 209 of FLPMA or other types of disposal actions such as R&PP, DLE, etc. The law does not mandate any sales or establish any quotas for sales or purchases.

#### Other Non-Traditional Methods of Acquisition

These may include General Services Administration (GSA) transfers of property or exchanges of other federal agency assets.

#### Coordinated Management:

Prior to and during implementation of this acquisition strategy, it is anticipated that there will continue to be management issues arising from the intermixed land ownership patterns within the planning area. These issues may continue in some areas of the Sonoita Valley APD over the long term. Continued coordination between the BLM and appropriate State agencies, counties, private landowners and the U.S. Forest Service will be important in dealing with issues regarding management of public lands and intermixed and surrounding State Trust, county, and private lands and surrounding Forest Service lands. Section 3 of the Las Cienegas Act addresses this coordination need by directing the Secretary to coordinate the management of the public lands within the Acquisition Planning District with that of surrounding county, State, and private lands consistent with the provisions of subsection 3(d).

The Act ensures the protection of State and private lands and interests through subsection 3(d) which states that "Nothing in this Act shall be construed as affecting any property rights or management authority with regard to any lands or interest in lands held by the State of Arizona, any political subdivision of the State of Arizona, or any private property rights within the boundaries of the Acquisition Planning District. Similarly, the Act ensures the continuation of the BLM's management authority over public lands in the Sonoita Valley APD in Section 3 (e) which states "Nothing in this Act shall be construed as in any way diminishing the Secretary's or the Bureau of Land Management's authorities, rights, or responsibilities for managing the public lands within the Acquisition Planning District."

The Act also addresses coordination and cooperative agreements in subsection 6(c) of the Act which states “In order to better implement the management plan, the Secretary may enter into cooperative agreements with appropriate Federal, State, and local agencies pursuant to section 307(b) of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1737(b)).”

### **Other Related Efforts for Open Space Protection**

1. Pima County’s Sonoran Desert Conservation Plan.
2. Sonoita Crossroads Community Forum’s Comprehensive Plan for Northeast Santa Cruz County.
3. Legislative efforts: various ballot measures, if passed, would authorize state exchanges, change designation of some state lands to conservation use, etc.
4. Land Trust efforts. The Southeast Arizona Grassland Trust is active in the Sonoita area. This should result in the acquisition of conservation easements on private lands in the Sonoita Valley with important resource values and uses.

### **Definitions:**

**Easement:** The right to use land in a certain way granted by a landowner to a second party. See also Conservation Easement.

**Conservation Easement:** An easement to assure the permanent preservation of land in its natural state or whatever degree of naturalness the land has when the easement is granted. Can also be defined as an agreement whereby a landowner sells or donates the right to develop his or her land to the easement holder (a qualified government agency or nonprofit organization).

## 8. SUMMARY OF BIOLOGICAL OPINIONS

**PROJECT NAME: CIENEGA CREEK INTERIM GRAZING PLAN**

**Date of Opinion:** January 8, 1996

**Species Affected:** Gila topminnow, southwestern willow flycatcher, and lesser long-nosed bat.

### **Terms & Conditions**

*1) All actions are to be conducted in a manner that will minimize the take of the Gila topminnow and southwestern willow flycatchers and will minimize the suitability of the area for cowbird habitation.*

1.1 - Implement the interim grazing plan as outlined in the BO description, with the exceptions found below.

1.2 - The timing, use, year-long rest, and grazing deferment of the various pastures will be as described. Riparian areas will be excluded from grazing.

1.3 - Livestock units on allotments shall not exceed 1,500 animal units/year.

1.4 - The fencing and construction of the 5 new riparian enclosures and the 6 sacaton pastures will be as specified in the Environmental Assessment.

1.5 - The 3 existing and 4 proposed crossing lanes shown in Table 3 of the BO may be used. The road crossing lane shown on the EA map (T 18 S, R 17 E, Sect. 34) shall be used in rotation with the other 7 proposed and existing lanes. Use of the crossing lanes will be determined through the biological planning process as described in the proposed action. Each lane can be used up to twice/year and all cattle must be moved through the lane within 10 days. Cattle must not be allowed to remain in the riparian zone.

1.6 - Existing riparian enclosures and water gaps will not be available to cattle (Karen Trap, A1, A2, A3, A4, Bahti's Bog, Lower 49 Gaps) after adjacent waters are completed. Construction of the represses should begin next to the water gaps. All proposed riparian enclosures and water gaps will be fenced to exclude cattle within one year from the date of this opinion.

1.7 - The fences of all riparian enclosures shall be inspected and maintained at least twice annually.

1.8 - The 14 new well, 6 well equip or redrills, and the associated pipelines must be located as specified in this BO.

1.9 - All new repressos must be located to minimize the likelihood of floods moving exotic fish and bullfrogs into topminnow habitat.

1. Represses should be located outside of the current 100-yr floodplain when possible.
2. Represses shall be located outside of the active channel except for Rattlesnake Tank, and tanks in the Empire Gulch and Cinco Ponds.



3. Represses shall be constructed so runoff from precipitation captured by each represso is minimal.
4. The max. water depth in a represses may not exceed 4ft. at any spot.
5. The represses shall be used only when required to water cattle and shall be allowed to dry when no longer needed to water cattle.
6. If represses do not dry within 6 months after use ends, they shall be drained.
7. Represses should be located so access to the public, and potential for unauthorized release of non-native fish and bullfrogs, is minimized.

1.10. - The locations of the proposed upland plains developments shall be as specified in Tables 6 and 7 of this BO.

1.11. - Implement grazing rotation and pasture use and riparian exclosures and pastures within one year of the date of this opinion.

1.12. - Since no deadline for IGP is given, if the IGP remains in effect more than 5 years after the date of the opinion, the result would be a change in the agency action and reinitiation of section 7 consultation will be required.

*2) Monitor the fish community and habitat including crossing lanes, grazed riparian zones, and represses to document the level of incidental take and to check for introduction of exotic fish and bullfrogs.*

2.1 - Conduct basin-wide type fish habitat monitoring on at least 4 - 0.25 mile reaches of the creek every 3 years to determine habitat trends.

2.2 - A minimum of 5 habitats will be sampled annually in specified "Fall Fish count" sites prescribed by the AGFD. Blocknets and seines will be used for one pass sampling to determine relative abundance and populations trends and to screen for exotic fishes and bullfrogs.

2.3 - Riparian condition monitoring sites established in 1989 and reread in 1994 will be assessed every 5 years.

2.4 - Visually inspect and photograph the crossing lane and the area downstream from the lane for dead fish and sloughed banks in the period beginning with 1st day of use to the day after use (1-11 days). The inspections should be earlier rather than later.

2.5 - Visually inspect and photograph the grazed portion of Cienega creek near the Narrows annually for negative impacts to riparian condition caused by grazing.

2.6 - Visually inspect each represso 6 months after use to look for evidence of exotic fish and bullfrogs and to determine if draining the represso is necessary. If a sufficient data set has built that shows these inspections to be unnecessary, BLM may cease this action after concurrence with the service.

2.7 - When the Biological Work Group meets, employ them to determine if the IGP is meeting its stated goals and objectives, and if the crossing lanes and the grazed portion of Cienega Creek are undergoing unacceptable degradation.

*3) Maintain complete and accurate records of fish and avian populations and habitat monitoring of both the riparian zone and the uplands and all actions taken to implement the terms and conditions of the BO.*

3.1 - Maintain complete and accurate records of fish populations and habitat monitoring of both the riparian zone and the uplands. Report on actions taken to implement the terms and conditions of this biological opinion. The report will include the dates that repressos are used, the dates they are inspected after use and if and evidence of exotic fish or bullfrogs are found.

3.2 - Copies of the records required in 3.1 above shall be provided annually to the Service on November 1<sup>st</sup>.

3.3 - Conduct annual surveys for the willow flycatchers before December 31, 1997, on Cienega Creek and its tributaries that may provide suitable habitat. The survey must follow the southwestern willow flycatcher survey protocol. Personnel conducting the surveys must have attended one of the flycatcher training sessions held annually.

- a. If flycatchers are detected, determine their breeding status using the following criteria:
  - repeated presence of a non-singing southwestern willow flycatcher using vocalizations other than the primary song next to an individual exhibiting territorial behavior;
  - observation of a flycatcher nesting material;
  - observation of flycatchers copulating;
  - verification of a flycatcher nest;
  - observation of a flycatcher carrying food items;
  - observation of a juvenile flycatcher.
- b. If breeding status is confirmed or suspected, continue monitoring efforts by visiting breeding locations at least once during each of the three 10-day periods of June and July or until observation indicates that flycatchers have stopped breeding efforts. Collect breeding and habitat data as outlined in the survey protocol and submit the completed data forms to AGFD Partners in Flight Program.
- c. If flycatcher breeding status is confirmed or suspected, begin a brown-headed cowbird trapping program in the following year by April 1, using established protocols. Once a breeding flycatcher pair is located, assume nesting will occur in the subsequent years and conduct trapping program through the end of July, or until the flycatcher breeding season ends.
  - i. Determine the number and location of traps based on the distribution of flycatcher along the drainage, but include a minimum of 2 traps.
  - ii Check all traps at least once each day; individual traps should be checked at approximately the same time each day.
  - iii. Maintain data on the brown-headed cowbirds trapping program, including:
    - data trapping is initiated and stopped;
    - locations of traps marked on a topographic map;
    - variations from the established protocol;
    - number and sex of brown-headed cowbirds and non-target species captured;
    - date of each capture.
  - iv Euthanize all captured brown-headed cowbirds in a humane manner; dispose of the dead birds properly.
  - v. Report to the Service each year on the survey and the trapping program.
- d. Monitor for signs of nest parasitism such a cowbirds fledgling from flycatcher nest(s). If parasitism does occur, reinstate consultation with the Service to alter management of mitigation measures as needed.

### **Conservation Recommendations**

1. Consultation on road maintenance. Road maintenance and road closure should be addressed in the land use plan.
2. Feasibility of using metal tanks instead of dirt represses for watering livestock. Few repressos as possible should be used and used for as short a period as possible.
3. Identify unoccupied sites on the Empire-Cienega that are suitable for Gila topminnow. This effort should be used in consultation and coordination with the Service, AGFD, and Cienega Creek allotment permittee.
4. Conduct a riparian ecological site inventory.
5. Monitor water quality parameters.
6. Measure and monitor vegetation utilization by livestock.
7. Begin research on the effects of cattle grazing on paniculate agaves, and thus, lesser long-nosed bat.
8. Determine how often lesser long-nosed bat use the RCA and the agaves occurring there.
9. Address management strategies that enhance the probability of southwestern flycatchers.

### **PROJECT NAME: LIVESTOCK GRAZING PROGRAM, SOUTHEASTERN ARIZONA**

**Date of Opinion:** September 26, 1997

**Species Affected:** (NOTE: only species in bold apply to Empire-Cienega Planning Area Allotments.) Kearney's blue star, Pima pineapple cactus, Nichol's turk's head cactus, Arizona hedgehog cactus, **Huachuca water umbel**, desert pupfish, spikedace, **Gila topminnow**, loach minnow, razorback sucker, (with critical habitat); **southwestern willow flycatcher**, (with critical habitat); cactus ferruginous pygmy-owl, **lesser long-nosed bat**, **jaguar**, and New Mexico ridgenose rattlesnake.

**Analysis by Species:** (Note: only includes species on Empire-Cienega Planning Area Allotments)

#### ***\*Huachuca Water Umbel\****

#### **Proposed Mitigation Measures**

*To protect the Huachuca water umbel:*

Note: Actions 1-4, 10-11 not applicable to planning area.

5. Existing AMPs for any allotments in Table 7 will be implemented no later than October 1998.
6. AMPs developed pursuant to item d. will be implemented no later than 2 years after completion.
7. Take action by October 1998 that will result in a long-term upward trend in range condition (see footnote on p.43) in areas of "improve" allotments listed in Table 7 that are in fair or poor condition.
8. For allotments in the "custodial" category in Table 7, work with other landowners in the allotment to improve range condition ( see footnote on p.43) in areas of fair or poor range condition. Actions the Bureau could take with others may include developing grazing strategies, planning and developing range improvement projects, and providing technical assistance.
9. Work with the Natural resource Service and landowners in the allotments to develop and implement watershed improvement projects that will increase infiltration.
12. Grazing on Bureau-administered lands in the allotments in Table 7 will adhere to the Bureau's Arizona Standards and Guidelines, Upland Livestock Utilization Standard, Safford Drought Policy, Arizona Ephemeral policy, and Riparian Area Policy.

13. Inventory, monitoring, and evaluations as described in the Bureau's proposed action (Bureau 1996a) and applicable sections of the bureau manual, will be conducted in the allotments in Table 7. Inventory, monitoring, and evaluation activities and results; removal of trespass cattle; fence construction; and AMP development will be summarized in an annual report to the Service, due March 15 of the year following the calendar year in which such activities occurred. The first report will be due March 15, 1998.

### **Conservation Recommendations**

(not applicable to planning area)

### ***\*Gila Topminnow\****

#### **Proposed Mitigation Measures**

*To protect the Gila topminnow and its habitat:*

1. Maintain the enclosure around the Martin Well.
2. Cooperate with the Service and the Arizona Game and Fish to identify site-specific measures to protect populations of topminnow from grazing program impacts as specific impacts are identified. These measures could include, among others, survey of stock waters for nonnative fish, replacement of nonnative fish populations with native fish in perennial stock ponds, and implementation of prescribed fire in grassland vegetation types in the Cienega Creek watershed to improve the condition of the watershed.

#### **Terms and Conditions**

***Note: Action 1) not applicable to planning area allotments.***

***2) No action shall be taken that would result in increased grazing pressure at Cold Spring Seep, Nogales or Little Nogales springs, Cienega Creek on the **Empirita allotment**, or Watson Wash.***

2.1 - Ensure that any changes in pasturing, season of use, stocking levels, construction or maintenance of range improvements, and other aspects of the grazing program do not result in an increase in cattle use at Cold Springs Seep prior to the fence construction, Nogales and Little Nogales springs, Cienega Creek on the Empirita allotment, or at Watson Wash. Measures to ensure that grazing pressure does not increase may include construction of enclosures to protect topminnow populations.

2.2 - Construct in 1997 a livestock enclosure around Cold Spring Seep (not TFO)

***3) Action shall be taken to ensure that watershed effects to topminnow habitat on the **Empirita**, Kimball Community, and Bryce allotments do not increase.***

3.1 - Ensure that long-term range condition does not deteriorate and remains in good or excellent condition on the Empirita, Kimball Community, and Bryce allotments.

3.2 - Grazing in the Empirita, Kimball Community, and Bryce allotments shall strictly adhere to the Bureau's Arizona Standards and Guidelines, the Upland Livestock Utilization Standard, Safford Drought Policy, Arizona Ephemeral Grazing Policy, and Riparian Area Policy.

*4) Activities that may result in a take of topminnow or destruction of topminnow habitat shall be evaluated, monitored, and modified as needed to reduce potential adverse effects to the species.*

4.1 - A mitigation plan shall be developed in coordination with the Service for each range improvement project that may adversely affect topminnow or its habitat, prescribed fire, and vegetation management project in the allotments listed in Table 12 (excluding projects in the Fan allotment and those addressed in previous consultations. Mitigation plans for prescribed fire shall limit to the extent practicable the possibility that fire would spread to riparian habitat at topminnow localities. Plans shall be approved by the Service.

4.2 - Evaluate all stock tanks on the allotments in Table 12 for their degree of risk to introduce nonnative fish to topminnow habitat. The Bureau will then, in conjunction with the Service and Arizona Game and Fish Department, develop and implement management techniques or practices for the tanks in each risk category. Management techniques may include, replacement of the existing tanks with alternative water sources, treatments to eliminate fish, or other appropriate methods. Proposed tanks will undergo the same evaluation for risk, and will include development of a mitigation plan approved by the Service.

4.3 - Inventory, monitoring, and evaluations as described in the Bureau's proposed action and applicable sections of the Bureau Manual shall be conducted in the Empirita, Kimball Community, and Bryce allotments.

*5) Monitor incidental take resulting from the proposed action and report to the Service the findings of that monitoring.*

5.1 - The Bureau shall submit annual monitoring reports to the Arizona Ecological Services Field Office by March 15 beginning in 1998. These reports shall briefly document for the previous calendar year the effectiveness of the terms and conditions, and documentation of take, if any. If such monitoring occurs, the report shall also summarize the condition of habitat at Gila topminnow localities, and fish monitoring data, including numbers of topminnow observed, presence of nonnative fish, etc. The report shall make recommendations for modifying or refining these terms and conditions to enhance topminnow protection or reduce needless hardship on the Bureau and its permittees.

#### **Conservation Recommendations**

1. Regularly monitor the Gila topminnow populations at the localities listed in Table 12 and report the results of such monitoring to this office.
2. Investigate water quality at Cold Spring Seep and take action to correct degraded water quality.
3. Implement prescribed fire on the Cienega Creek watershed to improve watershed condition.
4. Work with the Service and Arizona Game and Fish Department on planning for further introductions of topminnow into suitable habitat.
5. Coordinate with the Service and Arizona Game and Fish on recommendations of extant/extirpated status.

***\*Southwestern Willow Flycatcher\****

**Proposed Mitigation Measures**

*To protect the Southwestern willow flycatcher and its habitat:*

**Action Plan:**

The bureau's Safford and Tucson Offices will develop and implement a plan for the flycatcher that provides for protection and management of flycatcher habitat while implementing Bureau authorized activities.

**1) Mapping:** Maps will be prepared that convey the following information about the flycatcher habitat managed by the Safford and Tucson Offices:

- a. Location, size, shape, and spacing of habitat areas;
- b. Habitat stage with respect to flycatchers according to the following classification: suitable-occupied, suitable-unoccupied, suitable-unsurveyed, potential in the short term (1-3 yrs), and potential in the long-term (>3 yrs)
- c. Status of flycatcher surveys for each area of suitable habitat: either the date(s) surveyed or indication that the area has not been surveyed.

**2) Flycatcher Surveys:** A list will be prepared of areas to be surveyed following the most recent Service recommended protocol, along with the anticipated date.

**3) Habitat Management Guidelines:** Management guidelines ( fencing, grazing system use, or habitat improvement activities) will be prepared and implemented for areas at each of the habitat stages defined above for the mapping. These guidelines must include:

- a. Exclusion of livestock grazing within occupies or unsurveyed, suitable habitat during the breeding season (Apr 1-Sept.1)
- b. Management of suitable habitat so that its suitable characteristics are not eliminated or degraded.
- c. Management of potential habitat to allow natural regeneration into suitable habitat as rapidly as possible.

**4) Cowbird Control:** To reduce the likelihood of nest abandonment and the loss of flycatcher productivity owing to cowbird parasitism associated with the Bureau-administrated grazing activities in or near occupied habitats, the following will be implemented:

- a. Investigate and identify livestock concentration areas on Bureau lands in the action areas that are likely foraging areas for the cowbirds with in a 5-mile radius of occupied or unsurveyed suitable flycatcher habitat ( not including the Gila River corridor downstream of the San Jose Diversion in the project area), and evaluate ways to reduce any concentration areas found.
- b. If cowbird concentrations indicate a strong likelihood that parasitism to flycatcher nests is occurring or actual parasitism is documented through nest monitoring, possible cowbird foraging areas will be assessed, and appropriate control measures for cowbirds will be implemented. Evaluation of possible parasitism apply to active flycatcher nests on Bureau-administrated lands which are within 5 miles of Bureau-authorized grazing activities (not including the Gila River corridor downstream of the San Jose Diversion in the project area). These efforts will be coordinate with the Service, APHIS, and Arizona Game and Fish. Monitoring and/or control activities will be conducted by qualified personnel with appropriate permits.

The number and acreage of suitable and potential habitat areas may change due to natural riparian restoration processes, site potential, flood events which alter riparian vegetation and site capability,

refinements in habitat definitions, and additional inventory/mapping efforts. Keep the Service apprized of these sorts of changes on a regular basis.

Direction on this issue (grazing use in occupied or suitable-unsurveyed habitats during the nesting season) will be fully implemented prior to the 1998 flycatcher nesting season. A schedule for completion of the above features will be developed and transmitted to the Service with 60 days of the date of this BO. The Service will respond within 30 days thereafter with comments on the adequacy of the schedule for meeting the intent of the reasonable and prudent alternative.

### **Terms and Conditions**

*1) Actions shall be taken to ensure effects of grazing in riparian habitats, with subsequent direct effects to the flycatcher, are minimized.*

1.1 - Take immediate action to remove trespass cattle from the San Pedro River RNCA as soon as possible, and measures shall be implemented, including continuing to construct, inspect, and maintain fences, and working diligently with adjacent landowners, to ensure that trespass does not continue.

1.2 - Work with private landowners in the Brunchow Hill allotment to exclude livestock from Bureau-administrated lands in that allotment within the RNCA.

1.3 - AMP's shall be completed within 3 yrs. (or according to a schedule approved by the Service) for any allotments in the improve category listed in table 7 that currently do not have them.

1.4 - Existing AMPs for any allotments in Table 7 shall be implemented no later than October 1998.

1.5 - AMPs developed pursuant to item c. shall be implemented no later than 2 years after completion.

1.6 - Take action by Oct. 1998 that will result in a long-term upward trend in range condition in the "improve" allotments in Table 7.

1.7 - For allotments in the "custodial" category in Table 7, the Bureau will work with the landowners in the allotment to improve range condition in areas of fair or poor range condition. Actions the Bureau could take with others may include developing grazing strategies, planning and developing range improvements projects and vegetation management, and providing technical assistance.

1.8 - Work with Natural Resource Conservation Service and landowners in the allotments to develop and implement watershed improvement projects that will increase infiltration.

1.9 - Do not develop or maintain range improvement projects in the riparian corridor of the San Pedro River, except for fences, cattle guards, and gates to exclude and better manage cattle. Also, do not conduct chemical or mechanical vegetation management or prescribed fire in the riparian zone of the San Pedro or Babocomari rivers for the purpose of managing livestock.

1.10 - Construction, maintenance, or management activities in the riparian zone of suitable or occupied habitat shall occur outside the flycatcher breeding season

1.11 - Construction, maintenance, or management activities in the riparian zone of suitable or occupied habitat shall be planned to avoid removing willows and cottonwoods.

1.12 - Fence maintenance of enclosures, riparian pastures, or boundary fences, and sweeps of occupied or unsurveyed suitable habitat on allotments identified in Table 17 to push out cattle, will be conducted before each flycatcher breeding season.

*2) Actions shall be taken to ensure that effects of grazing activities in the watersheds of flycatcher habitat that may result in direct effects to flycatchers, are minimized.*

2.1 - A mitigation plan shall be developed in coordination with the Service for each range improvement project and vegetation management project that may adversely affect the flycatcher, and for each prescribed fire in the allotments in Table 17. Mitigation plans for prescribed fire shall limit to the extent practicable the possibility that fire would spread to riparian habitat in the allotments. Mitigation plans shall be approved by the Service.

2.2 - Grazing on the Bureau-administered land allotments in Tables 6 and 16 shall strictly adhere to the Bureau's Arizona Standards and Guidelines, the Upland Livestock Utilization Standard, Safford Drought Policy, Arizona Ephemeral Grazing Policy, and Riparian Area Policy.

*3) Where grazing activities may be facilitating brood parasitism, take action to minimize effects to the flycatcher.*

3.1 - New livestock management facilities that are likely to attract and support cowbirds must be located beyond 5 miles of occupied, suitable, or potential flycatcher habitat unless such facilities are: (1) located within 5 miles of suitable or occupied habitat on the Gila River downstream of the San Jose Diversion, or (2) crucial to protection of the riparian habitat, and (3) cowbird trapping is implemented to counteract the effect of the facility.

*4) Monitor incidental take resulting from the proposed action and report to the Service the findings of that monitoring.*

4.1 - Submit annual monitoring reports to the Arizona Ecological Services Field Office by March 15 of each year beginning in 1998. These reports shall briefly summarize for the previous year: (1) effectiveness of these terms and conditions, and (2) documentation of take, if any. If such activities or monitoring occur, the report shall also summarize: (1) inventory, monitoring, and evaluations as described in the Bureau's proposed action (Bureau 1996a) and applicable sections of the Bureau Manual for the allotments in Tables 6 and 16; (2) results of re-assessment of riparian functioning condition conducted every 5 years to assess achievement of habitat improvement; (3) grazing actions initiated or completed, including range improvement projects, prescribed fire, and vegetation management in the allotments in tables 6 and 16; and (4) records of downed or damaged riparian enclosure fences and action taken to remove trespass cattle. The report shall also make recommendations for modifying or refining these terms and conditions to enhance protection of the flycatcher and to reduce needless hardship on the Bureau and its permittees.



***\*Lesser Long-nosed Bat\****

**Terms and Conditions**

*1) Ensure that the grazing program does not facilitate public access to bat roosts.*

1.1- Ensure that construction, upgrading, or maintenance of roads associated with the grazing program does not increase or facilitate public access to known day roosts of the bat.

*2) Defined project areas and well-defined operational procedures shall be implemented to reduce adverse effects to bat forage plants due to construction of range improvement projects, chemical or mechanical vegetation management, seeding/planting of nonnative plants, or prescribed fire.*

2.1 - Prior to construction of range improvement projects, pre-construction surveys shall be conducted for paniculate agaves and saguaros that may be directly affected by construction activities, or in the case of new water sources, may occur within 0.5 mi of the proposed water source. If agaves or saguaros are found during pre-construction surveys, the following measures shall be implemented:

- a. Fences, pipeline, waters, and other range improvement projects shall be located to reduce as much as possible injury and mortality of agaves and saguaros.
- b. Disturbance shall be limited to the smallest area practicable and projects shall be located in previously-disturbed areas whenever possible.
- c. Vehicle use shall be limited to existing routes and areas of disturbance except as necessary to access or define boundaries for new areas of construction or operation.
- d. All workers shall strictly limit their activities and vehicles to designated areas. Construction workers shall be informed of these terms and conditions.

2.2 - No seeding/planting of nonnative plants shall occur on any allotments in which paniculate agaves or saguaros occur.

2.3 - Chemical and mechanical vegetation manipulation and prescribed fire shall be designed and planned to minimize adverse effects to long-nosed bat forage plants. Measures shall be developed to ensure that no more than 20% of agaves that are burned during prescribed fire are killed by the fire and that injury and mortality of saguaros are negligible.

2.4 - A mitigation plan shall be developed by the Bureau in coordination with the Service for the prescribed fire or chemical or mechanical vegetation management project within 0.5 mi of the bat roost or in the areas that support paniculate agaves or saguaros. The mitigation plan shall ensure that effects to bat roosts and forage plants are minimized and shall include monitoring of effects to forage plants. The plan shall be approved by the Service.

*3) Support surveys for bats to facilitate better management of bats and their habitat.*

3.1- Support surveys for long-nosed bat in the project area. Survey results shall be shared with the Service and used to make management decisions consistent with these terms and conditions.

*4) Graze allotments in a manner so as to protect and enhance the forage base of the long-nosed bat.*

4.1- Grazing in allotments supporting paniculate agaves or saguaros shall strictly adhere to the Bureau's Arizona Standards and Guidelines, the Upland Livestock Utilization Policy, Safford Drought Policy, and the Arizona Ephemeral Grazing Policy.

*5) Monitor incidental take resulting from the proposed action and report to the Service the findings of the monitoring.*

5.1- Submit annual monitoring reports to the Arizona Ecological Services Field Office by March 15, 1998. These reports will document the effectiveness of these terms and conditions, and documentation of take (if any). If such activities or monitoring occur, the report shall summarize: (1) grazing actions initiated or completed including range improvement projects, prescribed fires, and vegetation management; (2) monitoring results of prescribed fires; (3) allotment inventory, monitoring, and evaluation results; and (4) long-nosed bats detected. Make recommendations for modifying or refining these terms and conditions to enhance bat protection or reduce needless hardship to the Bureau and its permittees.

### **Conservation Recommendations**

1. In coordination with the Service and the Game and Fish, investigate the effects of the grazing program on the bat and its habitat, including clarifying the distribution of the bat and forage plants on allotments, and quantifying the direct and indirect effects of livestock grazing, development of range improvement projects, and other aspects of the grazing program.
2. Service requests notification of implementation of any conservation actions.

### ***\*Jaguar\****

### **Proposed Mitigation Measures**

*To protect the Jaguar and its habitat:*

1. Inform permittees by the letter within 90 days of the date of this opinion that the jaguar is listed as endangered under the Act, take of jaguar is prohibited under the Act, and violators are subject to prosecution and substantial fines.
2. Require that all appropriate State permits are obtained prior to authorizing any control activities.
3. Dense, low vegetation in major riparian corridors within allotments on Bureau-administered lands south of I-10 and Highway 86 will be maintained.

### **Terms and Conditions**

*1) Jaguars will not be subjected to any predator control activities, by any entity, associated with the project.*

1.1 - Predator control activities associated with livestock grazing and authorized by the Bureau shall require identification of the target animal to species before control activities are carried out. If the identified animal is a jaguar, that individual shall not be subjected to any predator control actions. If, when using dogs to tree mountain lions, a jaguar is inadvertently chased and/or treed by the dogs, the dogs shall be called off immediately once it is realized the animal is a jaguar.

*2) Permittees will be informed by the Bureau of the status of the jaguar and the specifics of its protection under the Act.*

2.1 - Permittees shall be informed by the Bureau by letter within 30 days of receipt of this BO that take of jaguar, including harm and harassment, is prohibited under the Act and could result in prosecution.

*3) All appropriate permits will be obtained prior to any predator control activities associated with the project.*

3.1 - Any predator control activities authorized by the Bureau and associated with this project shall be conducted only after all appropriate permits have been obtained.

*4) Jaguar habitat will be maintained in identified locations.*

4.1 - Dense, low vegetation in major riparian or xero-riparian corridors on Bureau-administrated lands south of Interstate 10 and Highway 86 shall be maintained.

*5) Investigate reports of any and all observations of jaguars or their sign in the project area and will provide the Service with a report of such investigations.*

5.1- In coordination with the Service and Arizona Game and Fish, we shall investigate all reports that it receives of observations of jaguars in the project area. The investigation shall include appropriate field collection of data. The Bureau is encouraged to enlist the expertise of the AZ Game and Fish. The Bureau shall provide a detailed report of each observation and investigation to the Arizona Ecological Services Office within 30 days of the occurrence of each incident. Such information shall also be included in the annual monitoring report to be submitted by March 15, 1998.

### **Conservation Recommendations**

1. The service recommends that the Bureau fund and/or carry out research to (a) determine the distribution of jaguar habitat within the project area, (b) determine the possible or actual distribution of jaguars within that habitat, and (c) determine means by which that habitat can be maintained and protected.
2. Service requests notification of implementation of any conservation actions.

## **9. SUMMARY OF EMPIRE-CIENEGA INTERIM GRAZING PLAN**

### **I. INTRODUCTION**

The interim livestock grazing management plan has been prepared to guide the management and administration of the ongoing livestock grazing operation on the Empire-Cienega Resource Conservation Area pending the development of the comprehensive land use plan scheduled for 1995. The interim grazing plan identifies the resource objectives, prescribes the manner in which the livestock grazing operation will be conducted to sustain the resources, identifies needed range improvements, provides the monitoring plan to measure the effectiveness of management actions, and details the procedures for the evaluation and modification of the livestock grazing use.

The Empire and Cienega ranches are located just north of the town of Sonoita, between the Whetstone and Santa Rita Mountains, 52 miles southeast of Tucson. The ranches are within Pima and Santa Cruz Counties, Arizona. Elevations average 4,600 feet. The ranches include 36,498 acres of recently acquired public land and 37,462 acres of state owned land.

The Empire and Cienega ranches are within the Santa Cruz River drainage. The broad alluvial Cienega Valley is dissected by Cienega Creek which drains portions of the Santa Rita Mountains to the west, the Canelo Hills to the south, and the Whetstone Mountains to the east. Cienega Creek flows north 20 miles to its confluence with Pantano Wash, which flows through the city of Tucson.

### **II. OBJECTIVES**

#### **A. Upland Vegetation**

1. Limit the average utilization to 40 - 60% of current years growth on "key" perennial grass species, and assure the physiological requirements of plant growth, rest, and reproduction are met for "key" species.
2. Monitor Range Condition, Trend, and Utilization at 21 study sites:

#### **B. Riparian Vegetation**

1. Maintain or restore an advanced ecological status and proper functioning condition on riparian areas, thus providing the widest variety of vegetation and habitat diversity for wildlife, fish, and watershed protection. This will include constructing fencing and upland water developments necessary to create riparian pastures along the perennial portions of Cienega Creek to provide adequate rest from livestock grazing.

A summary of the perennial stream reaches in the allotment:

Cienega Creek	10.4 Miles
Lower Mattie Canyon	1.25 Miles
Empire Gulch	1.50 Miles

2. Monitor riparian condition and function at 13 sites.

#### C. Wildlife

1. Improve habitat for antelope, mule deer, white tail deer, and other wildlife species by providing adequate food resources, water cover, and space, with the primary emphasis on antelope habitat. These efforts will include but not be limited to maintaining forage reserves, cooperatively developing wildlife waters, and providing periodic rest to portions of the range.
2. Specific objectives for individual species are pending development of the Land Use Plan Amendment.
3. Provide for the protection and recovery of habitats necessary to support healthy viable populations of the following special status species:

Gila Topminnow, Gila chub, longfin dace  
Lowland Leopard Frog  
Mexican Garter Snake  
Southwestern Willow Flycatcher  
Lesser Long-nosed Bat

4. Through analysis of the Upland and Riparian vegetation monitoring programs, and the Fisheries, Wildlife, and Aquatic monitoring programs; evaluate the effects of the livestock grazing on wildlife populations.

#### D. Watershed

1. Reduce erosion and stabilize the watershed by increasing the overall vegetative ground cover.
2. Measure groundcover at all the proposed upland vegetative monitoring sites.

### III. CURRENT AUTHORIZATIONS

The Bureau of Land Management currently leases the federal lands in the Empire-Cienega RCA to John and Mac Donaldson for livestock grazing. The BLM also subleases the State of Arizona livestock grazing leases (05-1597 and 05-1623) to the Donaldsons. The summary of acreage and grazing capacity by ownership is as follows:

<b>Grazing Lease</b>	<b>Acreage</b>	<b>Animal Units</b>
BLM No. 6090	36,538.31.00	704
STATE No. 1597	15,314.40	382
STATE No. 1623	22,147.29	414
<b>TOTAL</b>	<b>74,000</b>	<b>1500</b>

The initial authorized use on the Empire-Cienega Ranch allotment will be 1500 cattle yearlong. Continued data gathering and analysis will be necessary to determine whether this projection is accurate. Utilization figures, along with an analysis of actual use, climate, and range trend data will be used to determine if a change in livestock numbers is needed.

Due to the annual variability in forage production and plant growth resulting from fluctuations in moisture and temperature regimes, it may become necessary to disperse livestock or change from the planned rotation. Under extreme circumstances reduction of livestock numbers or removal of cattle from the allotment may be appropriate.

#### **IV. LIVESTOCK AND HERD MANAGEMENT CONCEPTS**

The Donaldson's management philosophy for livestock grazing on the Empire-Cienega is based on one herd of mother cows, moving through a series of flexible pasture rotations as the seasons progress. The ranch is divided into "units of usability," which are variable size units of rangeland that will support the base herd for a certain period of time during a certain time of the year. The units are tied to "primary" water sources.

Under the one-herd concept, all mature female cattle are run together, and all replacement females are bought at breeding age so they can enter into this herd as soon as possible. Bulls are put with the cows in mid-summer and pulled off in the fall. One herd is used to maximize rest in all other nongrazed units, and to better utilize the different species of grasses. Multiple selection of species is possible, and regrazing of species is kept to a minimum. The husbandry of the cattle becomes more efficient due to their concentration.

The rangeland on the planning area can be divided into fairly distinct units of variable size that can support the base herd of cattle for a specified period of time during the grazing rotation.

Units are classified as either:

1. Summer Use - Growing Season Use Units

- A. Sacaton
- B. Upland Plains

2. Winter Use - Dormant - Non-Growing Season Use Units
  - A. Empire Mountains
  - B. Whetstone Mountains
3. Combination (Growing and/or Non-Growing Season Use)
4. Supplemental Use Units
  - A. Horse Pastures
  - B. Shipping Pastures
  - C. Riparian Pastures

#### *Rangeland Pasture Units*

The units of usability are evaluated for their suitability for livestock use during the upcoming pasture rotations (forage quality and availability, water, fencing, etc). A proposed rotation strategy is developed for the animals' physiological needs and the vegetation condition. The proposed rotation is charted on graphs. The proposed livestock actions are then presented to the Biological Planning Team for review.

Once the biological planning has been completed and the upcoming grazing rotations tentatively scheduled, the livestock graze the particular unit of usability selected until monitoring of forage utilization and animal performance show the need to proceed to the next unit in the rotation. Desired levels of utilization may vary depending on the "key" forage species selected, wildlife objectives or concerns, plant penology, time of the year, current condition of the unit, and intensity of past grazing of the unit.

Holding a biological planning meeting in September or October each year to discuss adjustments to livestock numbers based on forage produced in the summer units following the summer monsoon season is critical to livestock management. Decisions on adjusting the herd size need to be made before shipping in October and November when the cattle are in the shipping pasture complex of the ranch.

#### *Riparian Pasture Units*

Riparian pasture units are mainly important as watering points for cattle and as lanes to allow cattle to cross from east pasture units to west pasture units. Riparian pasture units would provide only limited grazing for a short time by the main herd. These units could be grazed by a portion of the herd for specified periods to achieve resource objectives such as to reduce fuel loads for fire prevention or to open up marsh areas as open water habitat for waterfowl.

Once the northern riparian pastures are realigned, livestock use of the riparian pastures along Cienega Creek would be restricted to use of the northern 1.5 miles of the creek near the Narrows. The designated crossing lanes would be used as needed to rotate cattle to pastures unless resource objectives are to be achieved and these objectives have been consulted and agreed upon.

Develop range improvements as needed to achieve the resource objectives.

*Northern Riparian Pasture Realignment*

The highest priority is to complete the riparian pasture development, and realignment of existing fences at the north end of the Mac's sacaton pasture to the Narrows along Cienega Creek. This work would eliminate the need for the Fresno and Dominguez watering points and allow livestock to be excluded from Cienega Creek, except at the very north end at the Narrows, where alternative water sources cannot be easily developed. The fencing would also create additional sacaton pastures adjacent to the riparian pastures of Cienega Creek. This would create opportunities for more intensive pasture management. Cattle could be held longer in sacaton pastures in spring and fall, increasing the amount of rest on the upland summer range.

**Table 1  
Riparian Crossing Lanes on Cienega Creek**

<b>Lane</b>	<b>Pasture</b>	<b>TWP</b>	<b>RNG</b>	<b>Section</b>
New Road Crossing	North/Mac's Sacaton	18 S	17 E	34
New Jesse Lane	North/Lower 49/ Mac's Sacaton	18 S	17 E	26
New Fresno Gap Lane	Lower 49/ Rockhouse/Lower Mattie Sacaton	18S	17	23
New Dominguez Lane	Rockhouse/Fresno	18S	17	13
Narrows Lane	Rockhouse/Apache	18S	18	7
Lower 49 Gaps (Existing)	Lower 49/Mac's Sacaton	18 S	17 E	2

**Table 2  
Summary of Proposed Fencing**

<b>Project Name</b>	<b>Pasture</b>	<b>Township</b>	<b>Range</b>	<b>Section</b>	<b>Units</b>
Spring Water Sacaton Fence	E 500 Acre & 5 Wire & Mac's	19 S	17 E	2, 11	2 mi.
		18 S	17 E	34.35	1 mi.
Lower 49 Sacaton Fence	Lower 49/ 500 Acre, 5 Wire	18 S	17 E	26 NW, 27 NE	2 mi.
Lower Mattie Sacaton Fence	L. Mattie/Fresno	18 S	17 E	13, 23, 24, 25, 26	4 mi.
Rockhouse Riparian Fence	Rockhouse/Apache	18 S	18 E	6, 7.	2 mi.
		18 S	17 E	12, 13	
Narrows Riparian Fence	Empirita	18 S	18 E	6	1 mi.



**Table 3  
Empire-Cienega Ranch Water Developments**

<b>Project Name</b>	<b>Township</b>	<b>Range</b>	<b>Section</b>	<b>Units</b>
Lower 49 Well Drill Equip and Tank and Fence	18 S	17 E	27232627	1 well and tank 1.5 mi fence
Enzenburg North Well and/or Sam's Well Project	18 S	17 E	34 NW	1

*Upland Plains Units Developments*

The following proposed range improvements would enhance current management by giving more management options and facilitating control and movement of livestock. These improvements are not essential but would be considered when funding becomes available.

<b>Project Name</b>	<b>Township</b>	<b>Range</b>	<b>Section</b>	<b>Units</b>
Mud Springs Well Drill, Equip., and Tank	19 S	18 E	29 NE	1 each
Upper 49 Well Redrill, Equip, and Tank or Reservoir Construction	18 S	17 E	26 NW	1 each
Upper Road Canyon Well Drill, Equip, Tank and Fence	19 S	17 E	16 NE 26,27,35,36	1 well 2 tanks 3 mi fence
Upper Apache Div. Fence	18 S	18 E	222734	3 mi fence
Test Hole Wing Fence	18 S	18 E	2833	1 mi fence
Hilton Pasture Fence	Not Determined			
Road Canyon Div. Fence	Not Determined			

## 10. INTEGRATED VEGETATION TREATMENT PROGRAM

### VEGETATION TREATMENT METHODS

Along with other land management practices, the following vegetation management techniques will be used separately or in combinations to direct desired changes:

#### A. PRESCRIBED BURNING AND FIRE MANAGEMENT

Fire is a natural process within the grassland-savannah ecological sites. The goal of the Empire-Cienega Planning Area prescribed burning program is to simulate this process in maintaining grassland communities. To meet upland vegetation objectives, fire will be used as a tool to promote vegetation change through decreased shrub cover and increased cover by mid-to-tall-stature perennial grasses.

Prescribed burning is the planned application of fire to rangeland vegetation and fuels under specified conditions of fuels, weather, and other variables to allow the fire to remain in a predetermined area to achieve site-specific objectives. Management objectives include controlling certain plant species; enhancing growth, reproduction, or vigor of plant species; managing fuel loads, and managing vegetation community types. Prescriptions will be developed for each prescribed fire within the planning area. The area is too small to manage unplanned ignitions, so wildland fires will continue to be responded to as described in Chapter 2.

Action: Implement a prescribed fire program for the ecological sites (Sandy Loam Upland, Loamy Upland, and Limy Slopes) within the Empire-Cienega Ranch according to the following:

##### *Prescriptions:*

The 20,000 acres proposed for treatment above occur on three primary ecological sites: Sandy Loam Upland, Loamy Upland, and Limy Slopes. Prescriptions will vary by ecological site and condition.

##### *Forecast Narrative:*

Site specific burn plans will be developed for each planned unit within a project area. The plan is based on the resource objectives in the environmental analysis for that project. Prescriptions are developed that will achieve resource objectives, allow for firefighter and public safety, and achieve the objectives in the burn permit (smoke management). Temperatures, relative humidity, wind speed and direction, and fuel moisture will be monitored prior to, and during, prescribed fire implementation. A spot weather forecast will be obtained from the National Weather Service prior to ignition. If the forecast is not favorable the burn will be postponed.

##### *Unit Boundaries and Special Considerations:*

Many prescribed fire units include "allowable areas" which are used for fire control purposes. Adjacent allowable areas are analyzed for effects, as part of the unit. Prescribed fire units may be delineated within broader treatment areas. Treatment areas are shown on Map X-2-23. Treatment areas may include more than one ecological site. Treatments may include the use of management actions other than, or in combination with, the use of fire.

Unit rotation will be based on minimum fire frequency and drought. If wildland fires occur, the acreage lost to them will be considered in determining the amount of area to be treated with

prescribed fire for the year. Rotation of burn units and carefully planned sequencing will distribute short-term impacts throughout the watershed.

Each fire unit will have an operational site-specific burn plan and a smoke permit in place before being ignited. These plans will include special considerations to protect the following:

- riparian areas
- fish habitat
- cultural resources
- habitat of sensitive wildlife species

Precautions will be taken to ensure the safety of structures and other property. As much as possible, natural features and existing roads will be used to confine the fire. Needed fire control lines will be constructed.

To ensure protection of cultural resources, all prescribed burn areas will be inventoried for archaeological properties, historic structures, and traditional use plants. Areas surrounding such cultural properties will be pretreated to prevent destruction during a prescribed burn. These requirements are specified by BLM Instruction Memorandum AZ-90-52, Requirements for Cultural Resource Inventory of Prescribed Burn Areas.

Units will need to rest from grazing after burning (a minimum of two seasons) to enhance the establishment of new perennial grasses and increase the vigor of perennial grasses present before burning. Rest will also allow litter to accumulate and serve as a mulch and ground cover to protect the soil and enhance the seed bed. Once the desired plant communities have been attained, livestock grazing will resume in the unit.

Sediment control will be applied to burn units following BLM national guidelines and requirements and will also consider Best Management Practices prescribed by Arizona Department of Environmental Quality. Pre-burn and post-burn treatments will be evaluated in the operational burn plan for each unit or block of units. Treatments may include seeding, building physical structures, and mechanical and biological treatments. Any areas to be seeded will be seeded with native species or annual species that are not at risk of establishing on the treatment sites. Units that include Lehmann's lovegrass will be evaluated closely before burning since Lehmann's has been shown to spread as a result of fire.

*Unit Size:*

Desired annual burned acreage in this area for this fuel type is less than 2,500 acres under fire intensity level 1-2 and less than 300 acres under intensity level 3.

Limit fire size in the broadleaf riparian areas to less than 300 acres per year under intensity level 1-2 and less than 50 acres per year under intensity level 3.

Strive to treat 2,000 acres annually with prescribed fire to create a mosaic pattern in semidesert grasslands and to reduce the increasing and invading brushy species while increasing perennial grasses. Pursue a fuels hazard reduction strategy to reduce the intensity and size of wildfire, should one occur.

*Ignition:*

Prescribed fires used to improve upland condition will be ignited by hand or aircraft. Helicopters may be used to ignite larger or more complex units.

*Agreement:*

The use of fire as a tool has some inherent risk. Therefore, it is prudent to have a formal agreement with adjacent land owners that allows for and provides for protection of property. Agreements that address the use of fire on the Empire-Cienega Planning Area and that may affect other lands will be pursued with the State of Arizona, U.S. Forest Service, adjacent private land owners, and the local Natural Resource Conservation District (NRCD), and Sonoita-Elgin Volunteer Fire Department. This agreement should be a proactive, multi-year fire agreement with annual review. BLM will encourage the opportunity for cooperative efforts to restore grassland vegetation components using fire on other lands in the watershed.

*Relationship to Other Plans and Guidance:*

Treatments would be implemented according to the BLM Prescribed Fire Management Handbook (H-9214-1) and BLM Safford/Tucson Zone Fire Management Plan (1997).

*Application of the BLM Safford/Tucson Zone Fire Management Plan (1997):*

Because of constant variation in a multitude of factors such as climate; fuels; fire fighting resources available; and risks to life, property and natural resources, this plan is only a guide. The professional judgment of the incident commander, based upon the best information available at the time, will guide the implementing of this plan. Prescribed fire efforts will be curtailed if the target burned acreages are reached through unplanned ignitions.

Constraints common to all the polygons include limiting surface disturbance and fire spread where cultural sites, special status species, or both exist. Fire management staff will meet periodically with program specialists to heighten their awareness of sensitive resources and locations. A practical means to minimize disturbance of sensitive resources will be sought and refined.

Calculation of burned acreages for this plan will include all reported burned acreages by vegetation type or polygon, regardless of ownership. Resource impact is best measured by total acres burned without regard to jurisdictional boundaries. BLM will apply this plan to lands under its jurisdiction and coordinate with and support adjacent jurisdictions. BLM will use the expertise and help of other agencies and entities to achieve multiple use goals through fire.

*Recommended actions across all polygons include the following:*

- Reducing dangerous fuel buildups near structures.
- Educating the public about wildfire prevention by signing campsites and major roadways or by other forms of outreach
- Continuing to seek increased efficiencies through interagency agreements or other forms of cooperation.

*Reaching target burned acreage goals will depend on many factors, including the following:*

- Completion and approval of required plans.
- Suitability of weather and resource conditions.
- Availability of financial and personnel resources.

## **B. CHEMICAL TREATMENTS**

Treatments would be conducted according to BLM procedures. The chemicals can be applied by many methods, and the selected technique depends on a number of variables, including the following:

- Treatment objective.
- Physical characteristics of the site, including accessibility and size of the treatment area.
- Characteristics of the target species and the desired vegetation.
- Proximity to sensitive areas.
- Anticipated costs and equipment limitations.
- Water and vegetation condition in the treatment area during the treatment.

Herbicide applications will be scheduled and designed to minimize potential impacts on nonmarket plants and animals. The rates of application will depend on the following:

- Target species.
- Presence of nonmarket vegetation.
- Soil type.
- Depth to water table.
- Presence of other water sources.
  - Label requirements.

The chemicals would be applied aurally or on the ground using vehicles or manual application equipment.

## **C. MANUAL TREATMENTS**

*Manual methods of noxious plant control may be practical for the following purposes:*

- Clearing scattered plants invading grasslands.
- Cleaning up following other control methods.
- Maintaining treated areas against reinvasion.
- Removing small stands of non-native or poisonous plants before they can spread further.

Simple hand tools such as saws, axes, shovels, and picks are easy to obtain, operate, and repair, but labor costs are high per acre. Workers can also use power tools such as chain saws. In manual treatments workers would cut plants above ground level. Although the manual method of vegetation treatment is labor intensive, it can be extremely species sensitive and can be used around more sensitive habitats and in areas inaccessible to ground vehicles.

## **D. MECHANICAL TREATMENTS**

BLM will also use mechanical methods where practical to control undesirable plants. Choosing the best mechanical method will depend upon several factors:

- Characteristics of the target plant species (density, size of stem, brittleness, and sprouting ability).
- Need for seedbed preparation and revegetation of the treated area.
- Topography and terrain of the treatment area.
- Kind of soil (depth, amount of rock, erosiveness, and degree of compaction).
- Site potential. (The cost of improvement should be consistent with expected productivity.)

Some possible methods include bulldozing, root cutting, plowing, disking, chaining, brush cutting and crushing, mowing, contouring, seedbed preparation, and planting,

#### **E. BIOLOGICAL TREATMENTS**

Biological methods of vegetation treatment employ living organisms to selectively suppress, inhibit, or control herbaceous and woody vegetation. Methods include selective grazing by livestock such as goats, sheep, or cattle.

## **11. EMPIRE-CIENEGA LAS CIENEGAS WEED MANAGEMENT AREA**

A noxious weed/invasive species management area is being established on the public lands within the Las Cienegas NCA and Sonoita Valley Acquisition Planning District through this plan. Within the Empire-Cienega Las Cienegas Weed Management Area, management of noxious weeds and invasive species are addressed through the vegetation management priorities as listed in the Record of Decision for Vegetation Treatment on BLM Lands (USDI 1991):

Priority 1: Act to prevent or minimize the need for vegetation control when feasible, considering management objectives for the site.

Priority 2: Use effective nonchemical methods of vegetation control when feasible.

Priority 3: Use herbicides after considering the effectiveness of all potential methods or in combination with other methods or controls. Weed infestations are best prevented by ensuring that the seed or vegetative reproductive plant parts of new weed species are not introduced into a new area. Vegetation management methods will be addressed by site-specific actions.

As guidance, Executive Order 13112 directs federal agencies to do the following in managing invasive species:

1. Identify actions which promote the introduction or spread of invasive species.
2. Subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to:
  - prevent the introduction of invasive species.
  - detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner.
  - monitor invasive species populations accurately and reliably.
  - provide for restoration of native species and habitat conditions in ecosystems that have been invaded.
  - conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species.
  - promote public education on invasive species and the means to address them.
3. not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

### **References:**

“Partners Against Weeds” - An Action Plan for the Bureau of Land Management, January 1996, USDI-BLM  
Guidelines for Coordinated Management of Noxious Weeds in the Greater Yellowstone Area

## **12. FACILITY INVENTORY MAINTENANCE MANAGEMENT SYSTEM (FIMMS)**

### **A. MAINTENANCE LEVELS - ROADS**

BLM Road Maintenance Levels - The assigned maintenance level reflects the appropriate maintenance that best fits the Transportation Management Objectives for planned management activities. Roads will be prioritized for maintenance needs or may be maintained at lower levels depending upon funding.

*Level 1* - This level is assigned to roads where minimum maintenance is required to protect adjacent lands and resource values. These roads are no longer needed and are closed to traffic. the objective is to remove these roads from the transportation system.

(Minimum standards for Level 1) - Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Grading, brushing, or slide removal is not performed unless roadbed drainage is being adversely affected, causing erosion. Closure and traffic restrictive devices are maintained.

*Level 2* - This level is assigned to roads where the management objectives require the road to be opened for limited administrative traffic. Typically, these roads are passable by high clearance vehicles.

(Minimum standards for Level 2) - Drainage structures are to be inspected within a 3-year period and maintained as needed. Grading is conducted as necessary to correct drainage problems. Brushing is conducted as needed to allow administrative access. Slides may be left in place provided they do not adversely affect drainage.

*Level 3* - This level is assigned to roads where management objectives require the road to be open seasonally or year-round for commercial, recreation, or high volume administrative access. Typically, these roads are natural or aggregate surfaced, but may include low use bituminous surfaced roads. These roads have defined cross section with drainage structures (e.g., rolling dips, culverts, or ditches). These roads may be negotiated by passenger cars traveling at prudent speeds. User comfort and convenience are not considered a high priority.

(Minimum standards for Level 3) - Drainage structures are to be inspected at least annually and maintained as needed. Grading is conducted to provide a reasonable level of riding comfort at prudent speeds for the road conditions. Brushing is conducted as needed to improve sight distance. Slides adversely affecting drainage would receive high priority for removal, otherwise they will be removed on a scheduled basis.

*Level 4* - This level is assigned to roads where management objectives require the road to be open all year (except may be closed or have limited access due to snow conditions) and to connect major administrative features (recreation sites, local road systems, administrative sites, etc.) to County, State, or Federal roads. Typically, these roads are single or double lane, aggregate, or bituminous surface, with a higher volume of commercial and recreational traffic than administrative traffic.

(Minimum standards for Level 4) - The entire roadway is maintained at least annually, although a preventative maintenance program may be established. Problems are repaired as discovered.



*Level 5* - This level is assigned to roads where management objectives require the road to be open all year and are the highest traffic volume roads of the transportation system.

(Minimum standards for Level 5) - The entire roadway is maintained at least annually and a preventative maintenance program is established. Problems are repaired as discovered. These roads may be closed or have limited access due to snow conditions.

## **B. MAINTENANCE LEVELS - RECREATION SITES**

*Level 1* - Sites no longer meeting BLM objectives or no longer needed. Begin process to transfer site to another government entity or removing improvements and returning the site to its natural state. Dependent upon specific management transfer to undeveloped natural condition removes site from real property records as soon as possible. Any unused site.

(Minimum standards for Level 1) - No maintenance to be performed. No additional condition survey is required.

*Level 2* - Sites included in this level include all undeveloped sites which receive repeated visitor use during all or parts of the year or on a seasonal basis.

(Minimum standards for Level 2) - Maintain to assure health and safety standards are met. Assure protection of the Government investment. Sites maintained on the average, once per year. Condition surveys are completed during time of maintenance.

*Level 3* - This level includes sites where some minimum level of recreation facility development of physical resource protection (bank stabilization, gravel surfacing, etc.) Has been established.

(Minimum standards for Level 3) - Maintain to assure health and safety standards are met. Assure protection of the Government investment. Sites maintained to assure fair condition/appearance. Sites maintained on the average, twice a month. All critical repairs made within 10 working days, non-critical repairs made within 20 working days.

*Level 4* - This level includes all sites which met less than five of the nine Land and Water Conservation Fund Act requirements for fee collection. Therefore, fees are not charged at these sites.

(Minimum standards for Level 4) - Maintain to assure health and safety standards are met. Assure protection of the Government investment. Sites maintained to assure fair condition/appearance. Sites maintained on the average, once a week during the use season. All systems/services are operational at the start of the use season, and upon failure, repairs are made within two working days. All non-critical repairs made within 10 working days of discovery. Sites maintained to assure fair to good condition/appearance.

*Level 5* - Sites that meet five or more of the nine Land and Water Conservation fund Act requirements for fee collections listed below, including both overnight and day use facilities, and fees are collected.

(Minimum standards for Level 5) - Maintain to assure health and safety standards are met. Assure protection of the Government investment. Sites maintained to assure fair condition/appearance. Sites maintained on the average, once a week during the use season. All systems/services are operational at the start of the use season, and upon failure, repairs are made immediately. Repairs to

non-critical items completed within two working days of discovery. Sites maintained to assure fair to good condition/appearance.

Land and Water Conservation Fund Act criteria for fee sites:

1. Tent or trailer sites.
2. Picnic tables.
3. Drinking water.
4. Access roads.
5. Refuse containers.
6. Toilet facilities.
7. Personnel collection of the fee by an employee or agent of the federal agency is operating the facility.
8. Reasonable visitor protection.
9. Simple containers for containing a fire (in areas where fires are permitted).

### **C. MAINTENANCE LEVEL - TRAILS**

The assigned maintenance level reflects the appropriate level of maintenance required to meet management objectives.

*Level 1* - These trails are closed to motorized and non-motorized use. This level is the minimum maintenance required to protect adjacent lands and resource values. The objectives may be to remove these trails from the trail system.

(Minimum standards for Level 1) - Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Brushing and removal of hazards is not performed unless trail drainage is being adversely affected, causing erosion. Closure devices are maintained.

*Level 2* - Low use trail with little or no contact between parties. Little or no visitor use management. Visitors may encounter obstructions like brush and deadfall.

(Minimum standards for Level 2) - Trail would require condition surveys once every year. Repairs will be done at the beginning of the season to prevent environmental damage and maintain access. Emphasis is given to maintaining drainage and mitigating hazards. The trail may be signed Not regularly Maintained. Major repair may not be done for several seasons.

*Level 3* - Moderate use trail with visitor use on a seasonal/and or peak use period with frequent contact between parties. Trail management is conducted with occasional visitor use patrols. Visitors are not likely to encounter obstructions.

(Minimum standard for Level 3) - The trail shall require a minimum of one condition survey 1 to 2 times per season. Major repairs shall be completed annually. Maintenance shall be scheduled two to three times per season, if required, to repair the trail for environmental damage and to maintain access. Trail is kept in good condition.

*Level 4* - High use trail used during specific times of the year with high frequencies of contact between parties. Regularly scheduled visitor use patrol and management.

(Minimum standards for Level 4) - Scheduled maintenance shall occur frequently during the use season (three or four times per season). Trail condition and accessibility for persons with disabilities is a major concern. Significant repairs shall be completed as within 10 workdays.

*Level 5* - A special high use trail with routine visitor use patrols and management.

(Minimum standards for Level 5) - Has a scheduled maintenance program. Trail condition and accessibility for persons with disabilities is a major concern. Significant repairs shall be completed within 2-3 workdays.

## **13. BLM**

# **RECREATION MANAGEMENT INVENTORY SYSTEM (RMIS)**

## **ACTIVITY GROUPS AND ACTIVITIES**

### **CAMPING & PICNICKING**

- Camping
- Picnicking

### **NON-MOTORIZED TRAVEL**

- Backpacking
- Hiking/Walking/Running
- Bicycling-Road
- Bicycling-Mountain
- Horseback Riding
- Pack Trips

### **SPECIALIZED NON-MOTOR SPORTS, EVENTS, & ACTIVITIES**

- Archery
- Dog Trials
- Hang-Gliding/Parasailing
- Orienteering
- Photography
- Horse Endurance
- Re-enactment Events/Tours

### **HUNTING**

- Hunting-Big Game
- Hunting-Small Game

### **INTERPRETATION, EDUCATION & NATURE STUDY**

- Nature Study
- Environmental Education
- Interpretative Programs
- Therapeutic Programs
- Viewing-Interpretative Exhibits
- Viewing-Cultural Sites
- Viewing-Scenery/Landscapes
- Viewing-Wildflowers
- Viewing-Other

### **DRIVING FOR PLEASURE**

- Driving For Pleasure

### **OFF-HIGHWAY VEHICLE TRAVEL**

- OHV-Cars/Trucks/SUVs
- OHV-ATV
- OHV-Motorcycle

## **14. MONITORING PROTOCOLS**

### **INTRODUCTION**

The following protocols are used in current monitoring for riparian vegetation, aquatic habitats, native fish and upland vegetation. Current monitoring will be expanded and developed into a broad ecological monitoring program (discussed in the second part of this section). The monitoring program will be further developed and summarized in the Final Resource Management Plan

### **RIPARIAN MONITORING PROTOCOL FOR RIPARIAN AREAS OF CIENEGA CREEK AND TRIBUTARIES**

#### **Background**

BLM inventoried riparian areas along Cienega Creek and its tributaries on public lands from December 1988 through July 1989 (see Chapter 3, Table 3-9). The riparian inventory techniques are outlined in the Phoenix District's Riparian Area Condition Evaluation (RACE) Handbook (BLM 1987d). As a result of the 1988-89 inventory, 11.1 miles (60%) of riparian habitat received ratings of 5-11 for an overall unsatisfactory rating, and 7.5 miles (40%) of riparian habitat received total ratings of 12-16 for an overall satisfactory rating.

In 1993 and again in 2000, BLM re-assessed the riparian areas along Cienega Creek using the riparian evaluation portion of the RACE inventory. The results showed continued improvement along much of the creek. Of the 11.9 miles of riparian habitat evaluated in 1993, 8.5 miles (71%) were in satisfactory condition, and 3.4 miles (29%) were in unsatisfactory condition. Of the 12.5 miles assessed in 2000, 100% were in satisfactory condition (see Chapter 3, Table 3-9; Appendix 3, Riparian Area Conditions and Management). Riparian proper functioning condition assessments completed in 1993 and in 2000 showed similar trends with the percentage of the creek in proper functioning condition increasing from 2% to 61% (see Chapter 3, Table 3-10, Appendix 3, Riparian Area Conditions and Management).

#### **Protocol**

Riparian condition of Cienega Creek, Empire Gulch, Mattie Canyon, and Gardner Canyon will be reassessed every five years using the condition assessment portion of the Riparian Area Condition Evaluation (RACE) inventory as well as the Bureau's Riparian Proper Functioning Condition Assessment.

In addition, 5 key riparian segments will be selected along Cienega Creek for more comprehensive evaluation. These minimum ½ mile segments will also be sampled every five years.

In riparian key areas which are dominated by a cottonwood-willow vegetation community, ten belt transects, 10 feet in width, and spanning the entire floodplain, perpendicular to the stream, will be sampled; the distance between transects will be approximately 250 feet. Within each belt transect, the total number of seedlings, saplings, mature and old trees will be counted by species. The length of each transect (across the flood plain) will also be recorded so that densities of the different age-classes can be calculated for each site. Seedlings are defined as plants less than 1 inch diameter at breast height (dbh) or less than six feet tall; saplings are defined as plants 1-6 inches dbh or greater than six feet tall; mature trees are defined as 6-20 inches dbh; and old trees are defined as greater than 20 inches dbh. For seedlings, utilization (based on browsing of apical stem) will be measured on a subsample of 50 or 100

seedlings (depending on availability) spread over the 10 bands. At each band, the lengths of six different ecological sites (aquatic, regeneration zone, river wash, lower terrace sand bottom, mid terrace sand bottom, upper terrace loamy bottom, upper terrace loamy woodland) will also be measured across the flood plain. These lengths will be used to calculate the percentages of each riparian ecological site at each key segment. Two photo points will be established at each site and two photographs will be taken at each photopoint, one facing upstream and one downstream.

Since the intensive riparian monitoring described above was developed, the vegetation along much of Cienega Creek has made the transition to a cienega dominated system. Monitoring methodologies for riparian key areas dominated by cienega plant communities are still being determined. At a minimum, the percentage of marsh habitat will be monitored using aquatic habitat sampling (see method below), plant composition of upper and lower banks will be monitored in plots along transects, and the percent vegetation cover on stream banks will be monitored according to Platts et al (1983).

## **AQUATIC HABITAT MONITORING CIENEGA CREEK**

### **Background**

In 1989-90 BLM classified all aquatic habitats along the perennial length of Cienega Creek and inventoried them for characteristics related to fish habitat. BLM inventoried habitat type and 12 parameters of habitat complexity, including depth, vegetation cover in the water, cover overhanging the water's surface, and undercut banks. In 2000 BLM re-assessed aquatic habitats along four segments of Cienega Creek to determine change over the 10-year period (see Chapter 3, Tables 3-11, 3-12, and 3-13). The selected segments varied from 0.28 to 0.52 miles in length. They were monitored for the same fish habitat characteristics as in 1989-90.

### **Protocol**

Aquatic habitats will be re-assessed every five years along Cienega Creek at the permanent monitoring stations established along four stream reaches. The stations, tied to easily identifiable land marks, vary from 0.28 to 0.52 miles in length. Within each monitoring segment, habitats will be classified sequentially using the stream habitat classification schemes in McCain et al. (1989) and Hawkins et al. (1993) with the addition of "marsh" as a habitat type. For each habitat unit, the following parameters important to defining fish habitat will be collected: substrate, length, mean channel width and water depth, maximum depth, woody cover, overstory canopy cover, overhanging vegetation, floating vegetation, emergent vegetation, submergent vegetation, undercut bank, bedrock or boulder ledge, Bank stability will be evaluated by measuring the linear quantity of stable and unstable (or disturbed) stream bank and its apparent cause following methods of Platts et al. (1983). In addition basic water quality parameters including temperature, D.O., pH, water clarity (Secchi depth), and conductivity will be measured.

## **NATIVE FISH MONITORING - CIENEGA CREEK**

### **Background**

Since 1988, native fish populations and habitats have been monitored annually along Cienega Creek. The number of sample locations has varied between three and twelve. The location of these stations is tied to pool habitats. Pool selection varied within specific stream reaches from year to year due to the dynamic nature of channel features.

### **Protocol**

A minimum of 5 stations will be sampled each year along Cienega Creek. At each station, 100-200 m of aquatic habitat will be sampled for native fish using fine meshed (1/8 inch) double weighted seines or a backpack electroshocker, depending on the stream conditions. Prior to sampling, the stream transect will be divided into macrohabitats using the same classification system employed for the Aquatic Habitat Monitoring. Afterwards, each macrohabitat will be sampled independently by a single pass of the appropriate sampling equipment. Fish numbers will be enumerated by species and age-class (juveniles vs. adults). These data will be recorded for each macrohabitat along with the distance of individual seine hauls or the number of shocking seconds in that macrohabitat. From these data, the relative abundance by species and age-class will be calculated and an index (catch per unit effort) to absolute abundance will be estimated by normalizing fish numbers by the distance, area or time sampled. Three photopoints will be established at each monitoring station, one on the downstream end of the transect, one on the upstream end, and one in the center. Two photographs will be taken at each photopoint, 1 looking upstream, the other looking downstream, to document gross channel features along the transect and adjacent to it. All monitoring stations will be sampled annually in September through November.

## **MONITORING STREAMFLOW - CIENEGA CREEK**

### **Background**

BLM measured instantaneous discharge on Cienega Creek monthly from 1988 to 1994 at two stations. One station was located in the reach between Pump and Fresno canyons and the other was located near the confluence of Oak Tree Canyon and Cienega Creek. In 1995 a stream gaging station (water level recorder and galvanized housing) was installed at the site of an old masonry dam on Cienega Creek just above the confluence with Sanford Canyon. Continuous operation of this gage has been limited by maintenance problems and inundation by flood flows. The BLM, in partnership with the U.S. Geological Survey (USGS), will be installing a new continuous recording stream gage at the same location in 2001.

### **Protocol**

Beginning in late 2001, continuous stream flow information should be available from this gage on the USGS real time gage network ([http://az.water.usgs.gov/rt-cgi/gen\\_tbl\\_pg](http://az.water.usgs.gov/rt-cgi/gen_tbl_pg)).

## **UPLAND VEGETATION MONITORING**

### **Background**

Ecological site inventories have been completed for the Empire-Cienega and Empirita allotments. The results of these inventories and locations of monitoring transects are included in Appendix 3.

### **Vegetation Sampling Procedures**

The following vegetation sampling procedures were followed in the delineated ecological site write-up areas to determine the current conditions:

A 500-foot-long transect (or two parallel transects - 250 feet each) was run in each ecological site where there was a notable difference in appearance. One hundred sample plots (40 cm X 40 cm) were read along the transect at five foot intervals. Vegetation composition, production, species frequency, and ground cover were measured in each plot.

### **Vegetation Composition**

The Dry Weight Rank method of estimating plant species composition was used (Methods of monitoring rangelands and other natural area vegetation) by G. Ruyle (University of Arizona, Division of Range management, Extension Report 9043).

One hundred - 40 cm X 40 cm quadrants were sampled along each 500-foot transect. The three most abundant species on a dry weight basis were identified in the quadrant and ranked. The species yielding the highest annual above ground production was given a rank of 1, the next highest a 2, and the third highest a 3. If a quadrant had less than three species, more than one rank was assigned to some species. The dry weight rank method assumes that a rank of 1 corresponds to 70% composition, rank 2 to 20%, and rank 3 to 10%. These weighing factors were derived empirically (Mannetje and Haydock, 1963). To estimate percent composition for the species within the write-up area, the ranks for each species were summed, multiplied by the weighing factor for each rank, and divided by the sum of the weighted ranks for all species combined.

### **Vegetation Production**

The comparative yield method for estimating range productivity was used (Methods of monitoring rangelands and other natural area vegetation) by G. Ruyle University of Arizona, Division of Range management, Extension Report 9043).

Five reference quadrants or standards (40 cm X 40 cm) were selected adjacent to the transect to represent the range in dry weight of standing plant biomass which was likely to be encountered along the 500-foot transect. The five standards were clipped and weighed to document the production. The transect was then run sampling 100 quadrants along the transect. The vegetation yield in each plot was then compared to the standards and placed in the closest rank.

To estimate the total plant production in lbs/acre, the number of quadrants in each of the comparative yield standards is summed and multiplied by the number of grams clipped for that standard. This total is then multiplied by 0.557 to convert the grams to lbs/acre for that standard. This is done for all five standards. These totals are then added together to calculate the total lbs/acre for the ecological site. To calculate the production of an individual species, the percent composition of the species can be obtained by multiplying the percent composition for that species by the total production for the site.

### **Plant Species Frequency**

The relative abundance of each plant species in each ecological site write-up area was determined using the Pace Frequency sampling method (Methods of monitoring rangelands and other natural area vegetation) by G. Ruyle, University of Arizona, Division of Range Management, Extension Report 9043).

Again 100 quadrants (40 cm X 40 cm) were sampled along a 500-foot transect. The frequency of occurrence for each species was calculated. Herbaceous vegetation species (grasses and forbs) were counted as occurring if they were rooted in the quadrant. Trees and shrubs were counted if they were either rooted in or had canopies that overhung the quadrant. The probability of occurrence for a species (total frequency) was calculated by dividing the number of occurrences by the total number of quadrants (100) sampled.



## Ground Cover

Ground cover was measured using along the same 500-foot transect by collecting point intercept data. A pointer was attached on the quadrant frame used for sampling. One hundred points were recorded along the transect. The following categories were used to group cover:

### Ground Cover Categories

Bare Ground	0 to 0.24 inches
Gravel	0.25 inches to 3 inches
Rock	>3 inches
Litter (includes annual plants)	

### Live Vegetation

Grass/Forb Basal Cover
Canopy Cover
Shrubs/Trees
Basal Cover
Canopy Cover

The ground cover "hit" was determined by visualizing the pointer from a raindrop viewpoint. The first category of cover that the raindrop would intercept on its path to the ground was counted as the "hit". The percent cover was then calculated by dividing the number in each category by the total number of points sampled (100).

## PROPOSED UPLAND VEGETATION MONITORING

The monitoring methodologies to be used and the timeframes for collection are as follows:

### Upland Vegetation Monitoring Schedule

Study Type	Method	Timeframe
Trend Studies	Pace Frequency	
Ecological Condition	BLM - ESI	
Plant Composition		
Herbaceous Species	Dry Weight Rank	
Woody Species	Clipping Tables	
Plant Production		
Herbaceous Species	Comparative Yield	
Woody Species	Clipping Tables	
Substrate Composition		
Shrub Canopy Cover	Need Protocol	
Ground Cover	Point Intercept	

## **15. ECOLOGICAL MONITORING PROGRAM**

### **--DRAFT--**

#### **INTRODUCTION**

In February 2000, the Bureau of Land Management and Sonoran Institute co-sponsored a technical workshop that focused on how to monitor ecological conditions on the Empire-Cienega Resource Conservation Area (RCA) in southeast Arizona. Participants were technical experts from agencies, conservation organizations, academia, and the private sector who have specialized knowledge of the area and its resources.

The goal of the workshop was to frame a threat-based ecological monitoring program for the Empire-Cienega RCA (since designated as the Las Cienegas National Conservation Area) that will ensure both short- and long-term protection of the area's natural resources under a flexible, multi-use management plan.

As a framework for discussions on a threat-based monitoring program, participants reviewed the significant resources and threats which were identified for the proposed Las Cienegas National Conservation Area in the 1999 Cienega Creek Watershed Proposed NCA Assessment.

Significant Resources Identified in the 1999 Cienega Creek Watershed Proposed NCA Assessment:

- Caves and Geology
- History and Archaeology
- Landscape Integrity
- Ranchlands/Ranching
- Recreational Opportunities
- Plant Communities: Upland and Riparian
- Views
- Water Resources
- Wildlife

Significant Threats Identified in the 1999 Cienega Creek Watershed Proposed NCA Assessment:

- Habitat Loss and Fragmentation
- Exotic Animals and Plants
- Groundwater Pumping/Extraction
- Recreation
- Inappropriate Grazing
- Vehicular Traffic, Off-Highway Vehicles
- Urbanization and Development
- Fire Suppression
- Mining
- Channelization

Participants then broke out into 5 groups, each focused on a specific resource category:

1. Water
2. Riparian/Wetland Vegetation
3. Upland Vegetation
4. Aquatic Wildlife
5. Terrestrial Wildlife

Each resource group was tasked with identifying the key ecosystem processes and/or most important resources to monitor for their resource category. For each monitoring component they identified, the five groups then listed the most important monitoring/research questions associated with that component; significant stressors impacting the component; the parameters that should be measured to monitor the condition of the component; and critical linkages among that monitoring component and those addressed by other resource groups. As time permitted, the groups also listed ideas for partnership opportunities and determining thresholds for stressors impacting the system.

## **RESOURCE GROUP SUMMARIES**

The following summaries highlight the key ecosystem processes and resources (i.e., monitoring components) and monitoring parameters that were identified by each of the five resource groups.

This information will be used as the foundation to develop the details of an ecological monitoring program for the NCA.

### **1. Water Resource Group**

Participants: *Bill Branan, Julia Fonseca, Brenda Houser, Lin Lawson, Bill Peachey; facilitated by Shel Clark*

#### **A. Key Ecosystem Processes/Resources:**

- Groundwater (Quality and Quantity)
- Surface Water (Quality and Quantity)
- Precipitation

#### **B. Parameters which should be monitored:**

##### Groundwater

##### *Water Quantity:*

- Well inventory including current number of wells (baseline) and changes or expansions in network.
- Groundwater levels in riparian monitoring sites – use well points in your cross-sections
- Groundwater levels in areas of potential threats (e.g., the Sonoita area) – use existing wells

*Water Quality – in wells (drinking water) and springs:*

- Nutrients
- Metals
- SDWA
- Others depending on threats

### Surface Water

*Water Quantity and Quality:*

- Natural variability in length of perennial stream reaches, driest conditions
- Instantaneous base flows of stream during driest conditions
- Data from fixed-continuous stream gauge (stage, temperature, pH, EC)
- Data from crest-stage recorders in tributaries
- Annual inspection of springs for flows, pH, etc.

### Precipitation

- Rainfall from multiple gauges in watershed.

## **2. Riparian/Wetland Vegetation Resource Group**

Participants: *Mark Briggs, Dave Gori, Ron Tiller, Frank Toupal, Marty Tuegel, and Peter Warren;*  
*facilitated by Mary Vint*

### **A. Key Ecosystem Processes/Resources:**

#### Hydrogeomorphological Processes

- Hydrogeomorphology/Proper Functioning Condition (HGM/PFC) stream system assessment<sup>1</sup>
- Groundwater Conditions<sup>2</sup> (depth to saturated soils, recharge)
- Streamflow Characteristics<sup>2</sup> (flow, volume, patterns)
- Channel Morphology and Sediment Movement (aggradation/erosion; bank stability, channel cutting, gully formation)
- Aquatic Habitats<sup>2</sup>

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<sup>1</sup> See *Applied River Morphology* by Dave Rosgen for information on HGM assessment; the PFC concept is addressed in a number of BLM technical reports.

<sup>2</sup> Note: The riparian resource group did not fill out a separate worksheet on how to monitor groundwater conditions, streamflow characteristics, or aquatic habitats, since the Water Resource and Aquatic Wildlife Groups addressed these components.

## Biotic Resources

- Sensitive Plants (e.g., endangered water umbel)
- Vegetation Mosaic (is it representative, including cottonwood-willow gallery forest, mesquite bosque, sacaton grassland, streambank herbaceous vegetation, and cienega?)
- Sacaton Bottomlands (are they healthy/functioning?)
- Herbaceous Perennials
- Exotic vs. Native Species
- Biodiversity
- Recovery of Agricultural Fields

### **B. Parameters which should be monitored:**

#### Sacaton Grasslands

- Basal Area and Percent Cover (plots or transects)
- Reproductive Effort (panicle numbers)
- Population Demographics
- Water Stress / Physiology
- Seedling Recruitment (use permanent plots and tagging to track fate of seedlings)
- Percent Cover of Mesquite or Light Interception (PAR or LA1)
- Recovery Patterns (GPS within permanent, reproducible grids established on agricultural fields and/or use low level aerial photography)

#### Cottonwood -Willow Forest and Stream Channel Vegetation

- Species Composition
- Woody Species Density / Age Classes
- Sapling Density

*To monitor species composition, woody species density / age classes, and sapling density, establish stream cross-section transects with sub-plots at intervals.*

- Herbaceous Understory Composition Frequency

*To monitor herbaceous, streambank vegetation, arrange study plots in a linear array along the channel bank, and record frequency and percent cover using the point intercept method.*

#### Cienega Vegetation

- Cienega Morphology
- Species List
- Density Of Species
- Sediment Input, Stability
- Changes in Cienega Reach Length
- Streamflow
- Depth of Groundwater
- 

#### Huachuca Water Umbel

- Map occurrences of patches (if patchy)
- Conduct frequency plot sampling along reaches where distribution is more continuous.

### 3. Upland Vegetation Resource Group

Participants: *Wally Alexander, Dave Bertelsen, Steve Boice, Don Breckenfeld, Grant Drennen, Kristen Egen, David Hodges, Linda Kennedy, Gerald Korte, Phil Ogden, Dan Robinett, Stephen Wood;* facilitated by *Alex Conley*

#### A. Key Ecosystem Processes/Resources:

- Precipitation
- Plant Species Frequency, Composition, and Density
- Reference Areas
- Soils
- Cover (Plant, Soil, and Wildlife)
- Utilization / Residual Biomass
- Spread of Exotics / Invaders
- Agave Densities / Nectar Production
- Swales and Drainages
- Fire Records
- Production

#### B. Parameters which should be monitored:

##### Plant Species Attributes

- Methods need to be objective (repeatable by different people) so that good estimates of trend can be developed using data from different observers.
- Similarity indexes can be used to assess the progress of a site towards or away from a desired condition. Identifying what is desired is important.
- Frequency and dry-weight rank have been monitored since 1995. Repeat photography is also used at identified key areas. The existing protocol might be improved by adding a measure of density based on the distance to the nearest plant.
- Monitoring data should be used to determine condition and trend for each site.

##### Soils

- Soil texture, horizons, and depth to restricting layer are good basic measures of soil type and status. Remote imagery can be used to stratify sampling sites.
- Compaction can be monitored by looking at bulk densities and using a densiometer. A penetrometer can provide relative measurements of compaction; a relationship can also be built to convert these measures to bulk density.
- Long-term measurements of soil moisture could be useful.
- Research to correlate changes in soils to changes in vegetative attributes for each soil type would make extensive monitoring much easier.
- Erosion can be monitored by looking at pedestaling and root exposure.

- Visual assessments and repeat photography can be used to monitor headcutting, gullying, and wind erosion.
- Erosion pins can help monitor sheet erosion.
- A ten-point cover frame can be used to measure microtopography
- The WEP model could be useful for erosion prediction, but is data intensive. It uses the distance to nearest plant measurement discussed earlier.
- Measurements of soil crusting could be useful.

### Reference Areas

- Reference areas must be big enough to be representative of undisturbed conditions (e.g., big enough to support their own rodent populations), representative of the topography and vegetation types being monitored, and not on an ecotone.
- Reference areas should be set up whenever management is changed, to be used as treatment-specific controls.
- Sampling should be reproducible.
- Documentation of past and current uses should be kept.
- Monitoring should be done at the same time (season) that other sites are monitored.

### Cover

- Must first determine what sort of cover and for what managing for-
- Ground cover is being monitored as part of the plant species attribute monitoring (but should be increased from 100 to 400 points per key area).
- Aerial photos can be used to determine tree/shrub cover.
- Canopy cover could easily be added to existing monitoring by estimating Daubenmire cover in each frequency frame.
- For sparrows, grass height and percent of habitat at height x are useful measures. This could be added to existing monitoring efforts by measuring average grass height for each quadrant on the sampling frame.

### Utilization

- Formal measurements not currently made but estimates are used in managing livestock.
- Must clearly define type of utilization being measured.
- Timing and method of measurement must be consistent.
- Distribution of utilization is also important; measuring key areas alone may not be enough.
- True utilization is measured after the end of the grazing season
- Stubble height and percent of area that meets criteria are useful measures for determining the amount of cover for sparrows and antelopes.

### Exotics and Invasive Species

- Use network of upland vegetation transects.
- Remote sensing to map lovegrass areas and extent.
- Interpretation of historic and recent air photography to measure the extent and rate of mesquite encroachment.

#### 4. Aquatic Wildlife Resource Group

Participants: *Mac Donaldson, Doug Duncan, Jeff Simms, Dale Turner; facilitated by Josh Schachter*

##### A. Key Ecosystem Processes/Resources:

###### Ecosystem Processes

- Recharge
- Flooding
- Perennial Surface Flow
- Sediment Balance
- Succession of Riparian Plant Community to a Cienega
- Fluvial Processes that Promote Habitat Diversity (flooding, sediment deposition, etc.)
- Fire
- Nutrient Cycling

###### Resources (surrogates for processes)

###### *Top Priority*

- Water Quality
- Vegetative and Aquatic Habitat Diversity
- Native/Non-native Species
- Invertebrates (snails and aquatic insects)
- Amphibians, Reptiles, and Fish

###### *Priority Resources Overlapping With Other Resource Groups*

- Surface
- Water Quantity
- Types of Surface Water (springs, seeps, creeks, marshes)
- Ducks and Flycatchers
- Micro-organisms (bacteria, algae)

###### *Non-priority*

- Small Crustaceans

##### B. Parameters which should be monitored:

###### Vegetative and Aquatic Habitat Diversity

- Watershed Condition (see Upland Vegetation Group)
- Water Quantity (see Water Group)
- Bank Disturbance (amount of exposed bank)
- Fire Effects (monitor water quality and sediment)
- Exotic Vegetation (check for presence and distribution)



### Amphibians, Reptiles, Fish and Native Species

- Presence, Distribution, and Abundance of Natives and Problem Non-natives

### Invertebrates

- Macroinvertebrate Abundance and Diversity

## **5. Terrestrial Wildlife Resource Group**

Participants: *Anita Cramm, Caleb Gordon, Dave Krueper, Janet Ruth, Sherry Ruther, Mike Seidman, Tim Snow, Frances Werner, Jeff Williamson; facilitated by Karen Simms*

### **A. Key Ecosystem Processes/Resources:**

#### Riparian Specialists

- Birds
- Small Mammals

#### Grassland Specialists / Endemics (includes sacaton and upland grasslands)

- Birds
- Small Mammals
- Invertebrates
- Biodiversity

### **B. Parameters which should be monitored:**

#### Riparian Specialists

- song sparrow
- common yellow
- yellow-breasted chat
- red bat

#### Grassland Specialists/Endemics

##### *Birds*

- Site fidelity of sparrows (Cassin's and Botteri's), aplomado falcon
- Density of birds – flushing into nets for sparrows (very intensive); transects for all others
- Biomass/density of grass
  - Grass height 6-8" (average) \*\*may need to modify
  - < 10% shrub composition
  - 75% cover (basal) – grass/grass litter

*Note: need to be added to grassland bird sub-objective*

  - compositional diversity of grasses
  - native perennial bunchgrasses (not just blue gramma/Lehmann's)

- Productivity and Survivorship –
- Nest search and nest monitoring – Mayfield method may be most
- Breeding birds on territories
- Point counts of singing birds (Cassin’s, Botteri’s in sacaton)

*Small Mammals*

- At a minimum, monitor diversity and density of rodents in a typical river bottom environment and an upland grassland habitat. Also monitor diversity and density of rodents in a mostly native grassland area and in an area dominated by Lehmann’s lovegrass to determine whether rodents are being affected by the invasion of this exotic. Measurements should be taken once or twice a year using grid trapping.
- Banner-tailed kangaroo rats (*Dipodomys spectabilis*): map and number mounds and determine if active.
- Bats – Endangered lesser long-nosed bat (*Leptonycteris curasoae*): Monitor use of specific agaves by bats at least every other year during the third week of August over several nights. A different agave should be monitored each night.
- Mist netting along Cienega Creek could be used to periodically sample bat diversity in the area.

*Invertebrates: to be completed*

*Biodiversity: to be completed*

## CONCLUSION

This information is a **draft** summary of expert opinion regarding which ecosystem processes and resources should be monitored—and how—in order to ensure that the Empire-Cienega RCA’s (now Las Cienega’s NCA) water, vegetation, and wildlife resources are protected over both the short and long term under a flexible, multi-use management plan. These recommendations will be incorporated into a threat-based ecological monitoring program for the RCA (now NCA) that will be an integral part of the BLM’s Final Las Cienegas Resource Management Plan. Cultural resources, views, and human uses including recreation will be focused on in future efforts so the monitoring program can be expanded to address them (see Monitoring Framework). In addition, if lands are added to the NCA in the future with cave resources, then monitoring protocols for cave resources will also be developed.

# APPENDIX 3

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# 1. WELLS AND RESERVOIRS WITHIN THE EMPIRE-CIENEGA PLANNING AREA

## Empire and Cienega Ranch Water Wells

Well Name	Location	Current Use	Well Registration No.
E1	T19S,R17E, Sec 19	Capped	55-608607
E2	T19S,R16E,Sec 12	Capped	55-608608
E3 Irey Well	T19S,R17E,Sec 20	Cattle- Sub Elect to a represso	55-608609
E4	T19S,R17E,Sec 8	Capped	55-608610
E5 Guardo Well	T19S,R17E,Sec21	Cattle - Sub Elect to a represso	55-608611
EP1	T19S,R17E,Sec 10	Capped	55-608606
E13 Rattlesnake Well	T19S,R17E,Sec 10	Cattle - Sub Elect to a represso	55-608617
E6 Oak Tree 2 Well	T19S,R16E,Sec 10	Cattle - Sub Elect to a represso	55-608633
E7 Road Well	T19S,R17E,Sec 9	Cattle - Sub Elect to a represso	55-608612
E8 Bill's Well	T19S,R17E,Sec15	Cattle - Sub Elect to a represso	55-608613
E9	T19S,R17E,Sec 10	Capped	55-6-8614
E10	T19S,R17E,Sec 23	Capped (not located)	55-608615
E11 New Cinco Well	T19S,R17S,Sec 14	Cattle - Sub Elect to a represso	55-608632
E12 New Well	T19S,R17E,Sec 1	Cattle - Sub Elect to a represso	55-608616
E14	T20S,R17E,Sec 22	Capped	55-608618
T1 Box Well	T19S,R17W,Sec 3	Cattle - Sub Elect to a represso	55-608619
T3	T20S,R17E,Sec 2	Capped?	55-608620
T4	T19S,R17E,Sec 32	Capped?	55-608621
T6	T20S, R17E,Sec 4	Capped?	55-608622
Sam Irrig Well 1	T18S,R17E,Sec 26	Capped	55-608624
Sam Irrig Well 2 aka Mac's Well	T18S,R17E,Sec 34	Cattle - Sub Elect to a represso	55-608625
Dyke Spring Well	T18S,R17E,Sec 35	Capped	55-608623
Enzenberg Well 1 (Orchard?)	T19S,R17E,Sec 31	Cattle - Elect Sub to a drinker	55-608626

Empire and Cienega Ranch Water Wells, continued

Well Name	Location	Current Use	Well Registration No.
T2 Empire Gulch Artesian Well	T19S,R17E,Sec 17	Cattle - Sub Elect to a represso Fire - Sub Elect to Airport Strip	55-608628
Johnson Well	T20S,R17E,Sec 4	Cattle - Sub Elect to a represso	55-634284
Airport Well	T19S,R17E,Sec 8	Windmill - not used	55-634285
Sprung Well 2	T20S,R17E,Sec 5	Capped	55-634286
Slow Poke Well	T19S,R17E,Sec 6	Developed for cattle and wildlife (old windmill)	55-634287
Upper Spg Water	T19S,R18E,Sec 17	Wildlife and Cattle Sub Elect and windmill	55-634288
Davis Well	T20S,R17E,Sec 22	Cattle - Sub Elect to a represso	55-634291
Mattie Horiz Well	T19S,R18E,Sec 9		55-634289
Sec 5 Horiz Well	T19S,R18E,Sec 5		55-634290
School Sec Well Highway Well	T20S,R17E,Sec 16		55-634292
Reeves Well	T20S,R17E,Sec 15	Cattle - Old Windmill	55-634293
South "Davis" Well	T20S,R17E,Sec 14	Cattle- Old Windmill	55-634294
Upper Hilton Well aka Alvarez Well	T20S,R17E,Sec 10	Wildlife - Windmill to wildlife tank and enclosure	55-634295
Alvarez Well aka Sprung #1	T20S,R17E,Sec 5	Cattle and Antelope via Sub Elect pump and pipeline to Vera Earl Ranch	55-634296
Hummel House Well	T19S,R17E,Sec 28	Domestic-Sub Elect	55-634297
Hummel Pot Hole Well	T19S,R17E,Sec 27	Cattle - Sub Elect to a represso	55-634298
Lower Hilton Well	T19S,R17E,Sec 24	Wildlife-Old Windmill	55-634299
Cottonwood Well	T19S,R17E,Sec 21	Cattle - Sub Elect to a represso	55-634300
Empire HQ Well #1	T19S,R17E,Sec 18	Domestic and Cattle Sub Elect to the Tower Storage Tank	55-634302
Empire Hq Well #2	T19S,R17E,Sec 18	Back-up to the main well, Sub Elect to Tower Storage	55-634301
Cieneguita Well	T19S,R17E,Sec 16	Cattle-Sub Elect to a represso. Also an abandoned windmill	55-634303
Cinco Well	T19S,R17E,Sec13	Wildlife-Solar Elect to a wildlife enclosure	55-634304
Lower Spring Water Well	T19S,R17E,Sec 12	Old Windmill-not in use	55-634305
Ferguson Well	T18S,R18E,Sec 20	Cattle and Wildlife - Sub Elect to a represso	55-634306

Empire and Cienega Ranch Water Wells, continued

Well Name	Location	Current Use	Well Registration No.
Fresno Well	T18S,R18E,Sec 19	Cattle-windmill	55-634307
Mary Kane Well	T19S,R16E,Sec 35	Cattle-Sub Elect to a represso	55-634310
West Well	T19S,R16E,Sec26	Cattle - Windmill	55-634315
Maternity Well	T19S,R16E,Sec 24	Cattle - Sub Elect to a represso	55-634316
Empire Well	T19S,R16E,Sec 14	Cattle-Sub Elect to a represso	55-634317
Oak Tree Well	T19S,R16E,Sec 2	Cattle-Sub Elect to a represso	55-634318
Road Canyon Well	T19S,R17E,Sec 36	Cattle-Windmill to two repressos	55-634319
Diamond A Well	T18S,R17E,Sec 33	None-Old Windmill	55-634320
North Well	T18S,R17E,Sec 32	Cattle-Sub Elect and Windmill to two repressos	55-634321
49 Well	T18S,R17E,Sec 28	Cattle-Windmill	55-634322
Sam Domestic	T18S,R17E,Sec 27	Capped	55-634323
Field Well	T18S,R17E,Sec 26	Not Used-Windmill	55-634324
Sanford Well	T18S,R17E,Sec 15	Horz Well, may look like a sprg	55-634325
Rockhouse Well	T18S,R17E,Sec 10		55-634327
Rockhouse Well 2	T18S,R17E,Sec 10		55-634326
Oil Test Well	T18S,R18E,Sec 33	Cattle-Sub Elect to a represso	55-634328
Mattie Well	T18S,R18E,Sec 31	Cattle/Wildlife Windmill	55-634329
Wood Canyon Well	T18S,R18E,Sec 30	Cattle/Wildlife Sub Elect and Windmill	55-634330
Edwards Well	T18S,R18E,Sec 29	Not Used - Windmill	55-634331
Apache Spg Well	T18S,R18E,Sec 27	Hand dug Well and Spring Development. Gravity flow to Storage Tank and represso for cattle and wildlife. Spring Box used by campers at Apache cabin.	55-634332
Ferguson Well #2	T18S,R18E,Sec 20	Wildlife/Cattle Sub Elect	55-634333
N Enzenberg Well	T18S,R17E,Sec 34	Not used	55-634334
Adobe Barn Well	T18S,R17E,Sec 35	Recreation/Horses. Sub Elect to pressure tank and corral trough	55-634335
Rex Well-Cienega Domestic	T18S,R17E,Sec 35	Cienega House Water	55-634357
Enzenberg 2	T19S,R17E,Sec 31	?	55-636223
Harness Well (55-)	T20S,R17E,Sec 17 SWNENE	Cattle/Wildlife Sub Elect to a represso	

### Empire and Cienega Ranch Water Wells, continued

Well Name	Location	Current Use	Well Registration No.
Johnson Well (55-)	T20S,R17E,Sec 4 SWSWNE	Not Used-Old Windmill	
Antelope Well (55-)	T20S,R17E,Sec 2 NWNENE	Cattle-Sub elect to a represso	
Milpa Well (55- 634356)	T18S,R17S,Sec 36	Not Used Windmill	

### Empire and Cienega Ranch Reservoirs

Name	Location	Stockpond Claim No.
N Enzenburg #3 Claim	T18S,R17E,Sec 34 SESWNE	#38-25836
N Enzenburg #2	T18S,R17E,Sec 34 SWSWNE	38-25837
N Enzenburg # 1	T18S,R17E,Sec 34 SESENE	38-25838
Lower Hilton	T19S,R17E,Sec 24 SWNWSE	38-25846
Oil Well #2	T19S,R17E,Sec 22 SWSENE	38-25847
Oil Well Tank	T19S,R17E,Sec 22 NESWSE	38-25848
Wind Tank	T19S,R18E,Sec 19 SESWNE	38-25849
Boulder Tank	T19S,R18E,Sec 19 NWNENE	38-25850
Apache	T18S,R18E,Sec 21 SWNWNW	38-25858
Edwards	T18S,R18E,Sec 29 SENWSE	38-25859
Wood	T18S,R18E,Sec 30 NWSWSE	38-25860
Cienegita	T19S,R17E,Sec 16 NESWNE	38-25865
Empire	T19S,R18E,Sec 9 SWNWSW	38-25882

### Empirita Ranch Water Wells

Well Name	Location	Well Registration No.
Chimenea Well	T18S, R17E, Sec. 2, SENE	55-616215
Wild Cat Well	T17S, R17E, Sec. 34, SENE	55-616169
Karen Well	T17S, R17E, Sec. 36 NENW	55-616170
Ken/Bootlegger Well	T17S, R18E, Sec. 31 SWSE	55-616177
Alfalfa Well	T17S, R18E, Sec. 29 NWNW	55-627739
Gary Well	T18S, R18E, Sec. 8 SWNE	55-616223
JoAnn Well	T18S, R18E, Sec. 10 SWNW	55-616224
Big House Circle Well	T17S, R18E, Sec. 17 SENW	55-507443
Mike Well	T17S, R17E, Sec 23, SENW	55-616166

## Empirita Ranch Reservoirs

<b>Name</b>	<b>Location</b>	<b>Stockpond Claim No.</b>
The Lake Tank	T17S, R17E Sec 13 SENW	36-04084 36-64888
Dam Tank	T18S, R18E, Sec. 15, NWNW	38-93877

## Rose Tree Ranch Water Wells

<b>Well Name</b>	<b>Location</b>	<b>Well Registration No.</b>
Horse Pasture Well	T.20S., R.18E., Section 21 NWNWNW	55-618578
Pasture Well	T.20S., R.18E., Section 17 NESESE	55-618571
Rose Tree LS Well	T.20S., R.18E., Section 17 NESWNW	55-618570
Rose Tree Submersible Well	T.20S., R.18E., Section 20 NENENE	55-618580
High Lonesome Well	T.20S., R.18E., Section 19 NWSWNE	55-618781
Abner Well	T.20S., R.18E., Section 22 SENWSE	55-618574



## Rosetree Ranch Reservoirs

<b>Well Name</b>	<b>Location</b>	<b>Stockpond Claim No.</b>
East Reservoir	T.20S., R.18E., Section 8 SESWSW	38-95359/ 36-42179 for "East Drainage
South Tank	T.20S., R.18E., Section 8 SWNWSW	38-95403
Schock Draw & Reservoir	T.20S., R.18E., Section 9 NESESW	38-95358/ Claim No. 36-42180 for "Schock Draw"
The Flats Draw & Reservoir	T.20S., R.18E., Section 17 SWNENE	38-95357/ Claim No. 36-42181 for "The Flats Draw"
Valley Tank & Wash	T.20S., R.18E., Section 17 SESWNW	38-19591/Claim No. 36-42182 for "Valley Wash"
Rose Tree LS No. 1 Pond	T.20S., R.18E., Section 17 NWSWNW	38-95360
Rose Tree LS No. 2 Pond	T.20S., R.18E., Section 17 NWSWNW	38-95402
Rose Tree LS No. 4 Pond	T.20S., R.18E., Section 17 NENWSW	38-95365
Rose Tree LS No. 7 Pond	T.20S., R.18E., Section 19 SENENE	38-95364
Rose Tree LS No. 8 Pond	T.20S., R.18E., Section 19 NESENE	38-95363
Rose Tree LS No. 9 Pond	T.20S., R.18E., Section 20 SWSWNW	38-95362
Rose Tree LS No. 10 Pond	T.20S., R.18E., Section 20 SWSENW	38-95361
Jack Daniels Reservoir & Draw	T.20S., R.18E., Section 22 SWSWNE	Certificate No. 2990/Stockpond Claim No. 38-19595/Claim No. 36-42184 for "Jack Daniels Draw"
Abner Pond & Wash	T.20S., R.18E., Section 22 SENWSE	38-19593/Claim No. 36-42183 for "Abner Wash"
Old Forester Tank & Draw	T.20S., R.18E., Section 23 NWNENW	Certificate No. 2993/Stockpond Claim No. 38-19596/Claim No. 36-42185 for "Old Forester Draw"
Hill and Hill Reservoir & Draw	T.20S., R.18E., Section 23 SWSWNW	Certificate No. 2992/Stockpond Claim No. 38-19598/Claim No. 36-42186 for "Hill & Hill Draw"

## 2. SPRINGS WITHIN THE EMPIRE-CIENEGA PLANNING AREA

### Empire and Cienega Ranch—Springs

<b>Spring Name</b>	<b>Location</b>	<b>Use</b>	<b>Water Filing No.</b>
Apache	T18S,R18E, Sec 27, NWSE	Developed for cattle, wildlife, humans	36-25963
Sec. 5 Horizontal Well	T18S,R18E,Sec 5 NWSESE	Horizontal Well, 2 Cement Tanks	55-634290
Upper Mattie (various) seeps	T19S,R18E, Sec 5 NESWSE	Undeveloped	36-04353
Mud Spring	T19S,R18E, Sec 28, SENWNW	Undeveloped	36-25960
Empire Gulch	T19S,R17E, Sec 18 NENE	Undeveloped and exclosed from cattle	36-25959
Unnamed Spring	T18S,R17E,Sec 35 SESWNW		36-25962
Cold Water Spring	T18S,R17E,Sec 23 SENWSE	undeveloped	36-25965
Sanford Spring	T18S,R17E,Sec 15 NWSWNE		36-25966

### Empirita Ranch—Springs

<b>Spring Name</b>	<b>Location</b>	<b>Use</b>	<b>Water Filing No.</b>
Nogales	T18S,R18E, Sec 11 NESE	Undeveloped, but used by livestock and wildlife	36-64894
Little Nogales	T18S,R18E, Sec 11 NESW	Undeveloped, but used by livestock and wildlife	36-64899
Smitty	T17S,R18E, Sec 28 NESW	developed, but abandoned. Used by cattle and wildlife	55-627736
Wakefield	T17S,R18E, Sec 27 NWNW	undeveloped	36-64896
Bootlegger	T17S,R18E, Sec 31 SESW	undeveloped	36-04110
Fresnita Spring	T17S,R18E, Sec. 33 SWNW		36-04112

### 3. ECOLOGICAL SITE INVENTORIES IN THE EMPIRE-CIENEGA PLANNING AREA

#### EMPIRE-CIENEGA RANCH ECOLOGICAL SITE INVENTORY

##### Range and Woodland Site Legend

(This section by Dan Robinett, NRCS, 1995)

Ten upland range sites and five bottomland sites (2 - woodland sites and 3 - range sites ) were mapped on the Empire and Cienega ranches within the Empire-Cienega Resource Conservation Area (RCA). Most of this area is within the Major Land Resource Area 41-3 and is desert grassland. Areas in the southern and western part of the Empire - Cienega RCA are transitional to the Major Land Resource Area 41-1 which is plains grassland and oak-grass savannah. In the hilly country on both the west and east sides of Cienega Creek, northern exposures exhibit plant communities characteristic of the 16-20 in. PZ, while the southern exposures exhibit plant communities characteristic of the 12-16 in. PZ. The ecological site inventory was done by Dan Robinett and Grant Drennen in the fall of 1995. Twenty eight sites were inventoried to document the survey. Transects were marked with steel posts and photos were taken. The inventory techniques used included pace-frequency, dry weight-rank , and comparative yield. In addition 100 random points were measured to determine ground cover. Each site was inventoried with a 100 plot transect using a 40 cm square plot frame. Woodland site overstory was inventoried with a 20 tree zig-zag transect. The inventory took about three weeks.

**Limy Upland** - One large area of this site occurs on the Empire-Cienega ranch. These are shallow, calcareous soils over cemented lime pans. They are light colored in the upper part. Slopes are nearly level to moderate. A long narrow strip of this site extends from the narrows in Cienega Creek all the way up Apache canyon to its confluence with Montosa Canyon. A large wildfire burned this site in 1991 on the north side of Montosa Canyon. Areas of this site on the south side of the canyon which did not burn show the continued thickening of shrubs on this site in the absence of fire for the last century. The potential plant community on this site was a mixture of grasses and shrubs. The dominant grasses include black grama, bush muhly, blue threeawn, stipa, fluffgrass, and slim tridens. The main shrubs are creosotebush, whitethorn, sandpaper bush, sophora and mariola. Small areas of this site occur in complex with other sites in upper Mattie, Spring Water and Mud Springs canyons. Most areas of this site on the ranch are in good ecological condition. The areas that burned in 1991 are in excellent condition.

**Limy Slopes** - Large areas of this site occur on the northeastern side of the ranch. It occurs in complex with Volcanic Hills in the Empire Mountain area. It occurs in complex with Loamy Uplands along both flanks of Cienega Creek and in complex with Loamy Hills in the south and west parts of the ranch. These are deep, calcareous soils with dark colors in the upper part and with surfaces well protected by covers of gravels and cobbles. Slopes range from moderate to steep. In the large ridges from Apache canyon all the way to Hilton Wash the southern exposures of this site have the potential of the 12-16 PZ and the northern exposures have the potential of the 16-20 PZ. The potential plant community of the south aspects is a mixture of grasses like, black and sideoats grammas, threeawns, wolftail and slim tridens with low shrubs including, false mesquite, zinnia and range ratany. The potential plant community of the north aspects is a grassland dominated by sideoats grama, New Mexico feathergrass, crinkleawn, wooly bunchgrass, threeawns and black grama. Important shrubs include, false mesquite, ratany, dalea, beargrass, agave, sotol and yucca. All areas of this site on the ranch are in either high good or excellent ecological condition.

**Limestone Hills** - Two small areas of this site occur along the northern boundary of the ranch in the Empire and the Whetstone mountains. It also occurs in complex with other sites in upper Mattie, Spring Water and Mud Springs canyons. These soils are calcareous, gravelly loams, shallow to limestone or calcareous sandstone bedrock. They occur on steep slopes and have well developed covers of gravels and cobbles. Large amounts of rock outcrop occur. The potential plant community on this site was a mixture of shrubs, succulents, perennial grasses and forbs. The main grasses are sideoats and black gramas, slim, rough and shortleaf tridens, southwest stipa, blue threeawn, Hall's panic, bush muhly and spike pappusgrass. Important forbs are croton, twinberry, bahia, globe mallow, penstemon and ground cherry. The main shrubs are ocotillo, Mearns sumac, agave, sotol, prickley pear, dalea, ratany, mint-bush, false mesquite, littleleaf and skunkbush sumacs, desert zinnia, sandpaper bush, sophora and shin dagger. Southern aspects have the potential of the 12-16 in. PZ and northern aspects have the potential of the 16-20 in. PZ. Most areas of this site on the RCA are in good ecological condition and need fire to progress toward excellent condition.

**Volcanic Hills** - A large area of this site occurs in complex with Limy Slopes in the Empire mountains. Another large area occurs in the Whetstone mountains and scattered areas occur in complex with other sites in Upper Fresno, Mattie, Spring Water and Mud Springs canyons. Soils are shallow and loamy to quartzite and volcanic bedrock. Soil surfaces are well protected by covers of rocks and gravel. They are not calcareous and slopes are moderate to very steep. On the Whetstone mountain side northern aspects have the potential of the 16-20 in. PZ and southern aspects have the potential of the 12-16 in. PZ. The potential plant community of the north aspects is an open canopy of juniper, Emory and Arizona white oak with an understory of perennial grasses, forbs and low shrubs. Dominant grasses are plains lovegrass, sideoats, purple and hairy gramas, green sprangletop, bullgrass, vine mesquite, Texas bluestem, cane beardgrass, prairie junegrass and squirreltail. Important shrubs include mimosa, shrubby buckwheat, agave, yerbe de pasmo, beargrass and skunkbush sumac. The potential community of the south aspects is a diverse mixture of shrubs, succulents, grasses and forbs. The main grasses include sideoats, slender, hairy, sprucetop and black gramas, curly mesquite, plains lovegrass, cane beardgrass, green sprangletop, wolftail and threeawns. The main shrubs are false mesquite, ratany, mimosa, shrubby buckwheat, ocotillo, agave, prickley pear, shin dagger and banana yucca. Most areas of this site on the ranch are in high good ecological condition. Some areas in the Whetstone Mountains on north aspects are in fair condition due to grass mortality in the last few drought summers and a bumper crop of annual goldeneye in the spring - summer of 1995. These areas had not been grazed during this drought period.

**Basalt Hills** - One small area of this site occurs south of the narrows flanking Cienega creek. Soils are shallow and clayey. They are also calcareous and formed on bedrock of diabase, shale and related parent materials. Soil surfaces are well protected by covers of cobbles and stones. The potential plant community is a diverse mixture of shrubs, succulents, grasses and forbs. Tobosa and black grama are the dominant perennial grasses. Other grasses include tanglehead, sideoats and slender gramas, threeawns and slim tridens. Common forbs include croton, twinberry, bahia, perezia, hibiscus, trailing four o'clock, spiny goldenhead and grass nuts. The main shrubs are whitethorn, mariola, mintbush, ocotillo, prickley pear, agave, false mesquite, ratany and trixis. This site is in good ecological condition on the ranch.

**Clayey Hills** - This site occurs in complex with other sites on the northern end of the RCA in Apache, Fresno and Woods canyons on the east side and in Fortynine and Stevenson canyons on the west side. Soils are shallow and clayey. They are non calcareous and are on parent materials like andesite, tuffs and breccias. Slopes are moderate. The potential plant community is dominated by grasses like tobosa, curly mesquite and sideoats grama. Common shrubs include false mesquite, ratany, mimosa, prickley pear and shin dagger. Areas of this site on the ranch are in low good ecological condition.

**Loamy Hills** - This site occurs as a large unit in the Empire and North pastures and in the West, Hilton and Davis pastures in complex with limy slopes. Soils are deep and loamy textured. They have surfaces that are

well protected by covers of rocks and gravels. Slopes are moderate to steep. North aspects have the potential of the 16-20 inch PZ and southern aspects have the potential of the 12-16 inch PZ. The potential plant community of the northern aspects can have an overstory of Mexican blue, Arizona white and Emory oaks with some one-seed juniper. The understory is dominated by mid-grasses like bullgrass, sideoats and hairy grammas, plains lovegrass, Texas bluestem, beggartick threeawn, green sprangletop and squirreltail. Common shrubs are beargrass, agave, false mesquite, shrubby buckwheat, yerbe de pasmo, herbaceous sage, dalea and mimosa. Important forbs include annual goldeneye, cudweed, stolon daisy, thistle, rosary bean, locoweeds, wild beans and Wrights lotus. The potential plant community on the south aspects is dominated by a mixture of grasses, low shrubs, succulents and forbs. The main grasses include sideoats, slender, hairy and sprucetop grammas, plains lovegrass, falls witchgrass, tanglehead, cane beardgrass and curley mesquite. The dominant shrubs are false mesquite, range and spreading ratanys, mimosas, prickly pear, hedgehog cactus, rainbow cactus and agave. Important forbs include evolvulous, sida, dychoriste, lotus, locoweed, cudweed, camphorweed, annual goldeneye and aster. Palmers agave reaches its best development on southern aspects of this site. Most areas of this site on the RCA are in high good ecological condition. Some areas on north slopes in the North and Empire pastures are in lesser condition due to grass mortality during the last few summer drought years and the tremendous goldeneye of the spring-summer of 1995.

**Loamy Upland** - This site occurs in two different physiographic areas on the RCA. It occurs on the first (lower) upland terrace out of Cienega Creek in complex with Sandy Loam Uplands. In this area it has the potential of the 12-16 inch PZ. It also occurs extensively in the southern and western plains on the second (higher) upland terrace area. Here its potential is transitional between the 12-16 inch PZ and the 16-20 inch PZ. These soils are deep, have thin gravelly sandy loam surfaces (2-3 in. thick) over clayey subsoils. Slopes are nearly level to moderate. The potential plant community of the lower terrace area is a grassland dominated by sideoats, blue, hairy and sprucetop grammas, plains lovegrass, cane beardgrass, wolftail and threeawns. Common shrubs include false mesquite, range and spreading ratanys. The main forbs are evolvulous, zinnia, sida, dychoriste, indian wheat and aster. Presently most of this site is dominated by mesquite and burroweed with lesser amounts of sideoats, blue and sprucetop grammas, threeawns, Lehmann lovegrass and curley mesquite. These areas are in high fair ecological condition and will need control of both mesquite and burroweed to reach their potential. The potential plant community of the upper terrace areas is dominated by midgrasses like sideoats grama, cane beardgrass and plains lovegrass with lesser amounts of blue, sprucetop and hairy grammas, wolftail and threeawns. Important shrubs include spreading ratany, false mesquite, agave, groundsel, shrubby buckwheat and yerbe de pasmo. Common forbs are rosary bean, greenthreads, greeneyes, dychoriste, stolon and rush daisies, evolvulous, sida, cudweed, matweed, snake cotton, zinnia, and thistle. Present day plant communities in this area are approaching their potential and condition is high good. Increases in the native midgrasses are needed to get ecological condition up to excellent. Also included in this area are soils which are similar to Loamy Upland soils but are calcareous in the clayey horizon. These soils produce a plant community similar (in kinds and amounts of plants) to Loamy upland with the addition of several lime loving plant species. It has not yet been described and should be called Limy loam upland and broken out of the Loamy upland site. Loamy uplands also occur in complex with Limy slopes along both sides of Cienega creek and in minor amounts in the large ridges of Limy slopes from Apache canyon south to Hilton wash. In these areas its present day condition is dominated by mesquite with a turf of short grammas and curly mesquite. Ecological condition in these areas is fair.

**Sandy Loam Upland** - This site occurs primarily on the first (lower) terrace area out of Cienega Creek in complex with Loamy Uplands. The soils are very similar to those for Loamy Uplands except these have much thicker (8-12 in.) surfaces of sandy loam over the clayey subsoils. Slopes are nearly level. The potential here is that of the 12-16 inch PZ and is a grassland dominated by black, sideoats, hairy, slender, Rothrock and sprucetop grammas, plains lovegrass, plains bristlegrass, Arizona cottontop, threeawns and cane beardgrass. Important forbs are evolvulous, sida, cudweed, camphorweed, wild beans, small matweed, daisy, zinnia and

aster. Presently all areas of this site on the RCA have an overstory of mesquite with burroweed in the understory in varying amounts. About half of the area of this site on the ranch been taken over by Lehmann lovegrass. Some areas of this site especially in the North and Enzenberg pastures are in good ecological condition even with the mesquite cover because they have excellent stands of native perennial grasses. Areas dominated by Lehmanns cannot be rated in ecological condition. Lehmann lovegrass reduces the diversity of native plant and animal species but provides adequate soil protection, similar biomass production and may actually be better able to compete with cool season shrubs like mesquite and burroweed than the native grama grasses. Throughout areas of this site, even with Lehmann present, plains lovegrass is increasing and moving into new areas.

**Shallow Upland** - This site occurs in complex with other sites in Rockhouse and Stevenson canyons on the northwest side of the ranch and in Apache, Fresno and Woods canyons on the northeast side. Soils are shallow or very shallow over hard bedrock of quartzite, rhyolite or sandstone. They are loamy textured and not calcareous. Slopes are nearly level to moderate. The potential plant community is a mixture of perennial grasses and forbs with several species of low shrubs. Important grasses are sideoats, black, hairy, slender and sprucetop grammas, curly mesquite, threeawns, aparejo grass, wolftail and plains lovegrass. The main shrubs are false mesquite, range ratany, dalea, mimosa, ocotillo, agave, prickley pear, zinnia and shrubby buckwheat. Areas of this site on the RCA are presently in good ecological condition.

**Loamy Bottom - Swales** - This site occurs in complex with Loamy Uplands throughout the west and southern parts of the ranch. It receives extra moisture as a result of runoff from adjacent upland sites. Soils are deep, dark colored silt loams and silty clay loams. Slopes are nearly level. The potential plant community is grassland. Dominant grasses include blue and sideoats grammas, vine mesquite, aparejo grass, cane beardgrass and plains lovegrass. Minor amounts of tobosa and sacaton occur on this site. Important forbs in the plant community are hog potato, spreading globe mallow, coyote melon, buffalo gourd, sunflower, goldenrod and knotweed. Most areas of this site in the north part of the Hilton pasture and in the Johnson and Enzenburg pastures are in low good ecological condition. Some of these swales gullied in the past, are in the process of healing, and most of them have been invaded with mesquite. Most areas of this site in the south part of the Hilton and in the West and Davis pastures are in high good ecological condition with little or no mesquite and very few gullies. Within the area delineated as this site there are inclusions of Clayey bottom range site. These soils are clays with high shrink-swell and exhibit churning and cracking. They are dominated by tobosa and vine mesquite and have similar production as the swales range site. They make up less than ten percent of the unit.

**Loamy Bottom - Subirrigated** - This site occurs as the primary floodplain of major creeks like Empire, Gardener and Cienega. It receives extra moisture during summer floods and has a seasonally high (4 - 8 feet) water table. Soils are deep, dark colored and heavy textured. Slopes are nearly level. The potential plant community is a sacaton meadow. Minor grasses include blue grama, alkalai sacaton, vine mesquite, sideoats grama and aparejo grass. Common forbs are conzya, sunflower, ragweed, mares tail, pigweed, lambs quarter, coyote melon and buffalo gourd. Most areas of this site on the ranch are in high good to excellent ecological condition. Some areas have been invaded by mesquite but are returning to open sacaton as the bottom becomes wetter and fires burn in these areas, eliminating mesquite. Some areas are drier than others due to channel cutting and deepening that initiated at around the turn of the century. Production on the drier sacaton sites like the Gardener may average about 3000 lbs. per acre. Production on more dependably flooded fields like the Five Wire and the 500 Acre pastures will range from 5000 to 6000 lbs. per acre. Included in the area delineated as this site are small areas which are marshy. They are true wetlands with water at or near the surface year round. These soils are very dark, heavy textured and feature the redoximorphic ( gleying and mottling ) features, characteristic of poorly drained soils. They are dominated by sedges, rushes, bullrushes,

cattails and forbs like bidens and yerbe mansa. These areas are a “Cienega Site” which has not yet been described and will be in the future as more information can be gleaned about it.

**Loamy Bottom - Mesquite** - This is a woodland site as it has over 15 percent tree canopy in the potential. This site occurs as a high stream terrace along the steeper reaches of Cienega Creek. It no longer benefits from extra moisture received as flooding but does have a water table at depths of 20 to 40 feet which mesquite roots can reach. Soils are deep, light colored loams and silt loams. Slopes are nearly level. The potential plant community is a mesquite bosque. Canopy of mature velvet mesquite can be as high as 50 percent and trees can reach heights of 40 feet. Other common trees on this site include Mexican elderberry, western soapberry, netleaf hackberry and catclaw acacia. The main shrubs in the understory are wolfberry, greythorn, fourwing saltbush, desert honeysuckle, desert hackberry, crucillo and mimosa. Several vines are important on the site including climbing milkweed, virgins bower, Mexican passion flower and morning-glory. Common understory grasses are sacaton, vine mesquite, green sprangletop, plains bristlegrass, squirreltail and dropseeds. Important forbs on this site are annual mustards, pigweed, lambs quarter, sunflower, ragweed, copperleaf and wheelscale. Most areas of this site on the ranch are at or near their potential. Some areas on the ranch (ie. around Dominguez water) have been cut for firewood and/or bulldozed. Removal of the mesquite overstory on this site can lead to a shrubby regrowth of greythorn, mimosa, wolfberry and mesquite. If salt cedar is present in the watershed it can take over areas of this site where the mesquite canopy has been removed.

Some areas along Cienega Creek resemble this site due to past mesquite invasion of the sacaton meadows. Soils in these areas are the dark colored silty clays and clay loams which developed under dense sacaton. If these areas still have the potential to flood and produce continuous growth of sacaton they will eventually burn often enough, with intense fires that will take out the mesquite.

**Sandy Bottom** - This site occurs as low stream terraces along drainageways of the major tributaries to Cienega Creek. It benefits from extra moisture received in flooding and as runoff from adjacent uplands. It does not have a water table within the reach of tree roots. Tree canopy on the site is less than 15 percent in the potential making this a range site by definition. Soils are deep and sandy. Slopes are nearly level. The potential plant community on this site is a diverse mixture of trees, shrubs, vines, grasses and forbs. Important trees are mesquite, catclaw acacia, desert willow, netleaf hackberry, Arizona black walnut, western soapberry, Arizona ash, and in some places Arizona white oak and Emory oak. The major shrubs are mimosa, burrobrush, southwest rabbitbrush, desert honeysuckle, fourwing saltbush, skunkbush, desert broom, littleleaf sumac and wolfberry. Vines include virgins bower, canyon grape, climbing milkweed, morninglory and Mexican passion flower. The main grasses are sacaton, spike dropseed, sand dropseed, sideoats grama, green sprangletop, bulb panic, cane beardgrass, Arizona cottontop, plains bristlegrass, deergrass and beggartick threeawn. Important forbs are thistle, coyote melon, wild cotton, sacred datura, sorrel buckwheat, mares tail, lambs quarter, ragweed and pigweed. Most areas of this site on the RCA are in good ecological condition.

**Sandy Bottom - Subirrigated** - This site occurs as the low stream terrace and streambanks of the wet reaches of Cienega, Empire and lower Mattie canyons. It benefits from extra moisture received as flooding and also from high water tables ( 4 to 10 feet ). Soils are deep and sandy. Slopes are nearly level. The potential plant community is a deciduous riparian woodland dominated by Fremont cottonwood and black willow. Tree canopy can be as high as 70 percent on this site. Other trees found in minor amounts include Arizona ash, Arizona black walnut, Mexican mulberry, desert willow, coyote willow and netleaf hackberry. Common shrubs in the understory are batamote, desert honeysuckle and skunkbush sumac. Canyon grape vine is very common with cissus occurring in minor amounts in rock floored areas. Important grasses are deergrass, sacaton, bulb panic, rice cutgrass, knotroot paspalum, Arizona wildrye, sedges, rushes and bullrush. Important forbs are stickseed bidens, watercress, monkeyflower, water speedwell, cow parsnip, yerbe mansa, pink smartweed, spiny aster, goosegrass, meadow rue, sunflower and ragweed. Most areas of this site on the RCA are

approaching their potential. Throughout areas of this site, even with Lehmann present, plains lovegrass is increasing and moving into new areas.

**Shallow Upland** - This site occurs in complex with other sites in Rockhouse and Stevenson canyons.



## EMPIRE RANCH ESI - Upland Vegetation Transect Locations

<b>Pasture - Unit</b>	<b>Township</b>	<b>Range</b>	<b>Section</b>	<b>Study No.</b>
#1 Shipping Pasture	19S	17E	18 NESE	1
North (Oak Tree N-aspect)	19S	16E	11 NENW	2
North (Oak tree S-aspect)	19S	16E	11 NENW	3
North (North end)	18S	17E	29 SWSE	4
Upper 49 (South end)	18S	17E	29 SENE	5
Rockhouse	18S	17E	10 NESW	6
Rockhouse	18S	17E	10 NESW	7
North (rattlesnake)	19S	17E	9 NWSW	8
Alamo Solo	19S	17E	20 NWSE	9a
Alamo Solo	19S	17E	20 NWSE	9b
Johnson	19S	17E	33 SENW	10
Hilton (Road Cny North aspect)	19S	17E	36 NESE	11
Hilton (Road Cyn South aspect)	19S	17E	36 SENE	12
Hilton (Heart S)	20S	17E	16 NWNW	13
Davis (West)	20S	17E	15 SESW	14
Davis (Middle)	20S	17E	11 NESE	15
Spring Water (L Hilton well)	19S	17E	24 SWSW	16
West (Outside exclosure)	19S	16E	26 NWNE	17
West (Inside exclosure)	19S	16E	26 NWNE	18
5 Wire	19S	17E	11 NWSW	19
Lower Mattie	18S	17E	36 NWNE	20
Upper Mattie	19S	18E	4 SESW	21
Fresno	18S	17E	25 SENE	22
Triangle	18S	18e	7 SWNW	23
Rockhouse (Falls)	18S	17E	14 SESE	24
Fresno (Dominguez)	18S	17E	13 NENW	25
Rockhouse (W of Narrows)	18S	17E	1 SESE	26
Apache (burned)	18S	18E	35 SESW	27
Apache (unburned)	18S	18E	21 SWNE	28

Ecological Site Condition Empire-Cienega Ranch

Ecological Site	Study No.	Acres	Existing Condition (1995 ESI Similarity Index % of Historic Climax Present)	Production Lbs/ac	1995 Esi %Comp.- Perennial Grass	1995 Esi % Bare Ground
Loamy Hills-	11	10050	Excellent (85)	1522	63	9
	12		Good (59)	931	83	22
	15		Good (61)	931	79	16
Loamy Upland-	13	6577	Excellent (77)	764	93	21
	17		Good (63)	670	60	13
	18		Fair (42)	382	53	24
Swales	10		Good (55)	1866	45	32
	14		Excellent (77)	1888	93	26
Sandy Loam Upland-	8	11523	Fair (44)	1083	66	40
	9A		Fair (31) <sup>1</sup>	1230	69	42
Loamy Upland	9B		Fair (32) <sup>2</sup>	949	64	68
	1		Good (54)	1068	74	30
	16		Fair (50)	778	82	25
Loamy Upland- Limy Slopes		6454				
Loamy Hills	2	6058	Excellent (92)	1939	49	9
	3		Good (72)	858	76	20
Limy Slopes	4	10765	Good (60)	908	76	23
	22		Good (54)	775	71	6
Volcanic Hills- Limy Slopes	7	3643	Good (72)	1947	72	3
	6		Excellent (85)	776	70	20
Limestone Hills- Limy Upland- Volcanic Hills	21	4423	Good (66)	3330	35	11
	28		Good (60)	764	32	-
Volcanic Hills- Shallow Upland- Clay Hills	5	5036	Good (66)	597	54	19
Volcanic Hills	27	1669	Fair (34)	2609	12	7
Limestone Hills	26	497	Good (67)	975	975	10
Basalt Hills	23	600	Good (71)	1341	58	5
Loamy Bottom (subirrigated)	19	3744	Good (66)	5510	60	24
Loamy Bottom (woodland)	24	581	TreeCanopy 80%	1612	8	8
	25		TreeCanopy-open	1395	12	36
Sandy Bottom (subirrigated)	Riparian	608				

Ecological Site Condition Empire-Cienega Ranch, continued

<b>Ecological Site</b>	<b>Study No.</b>	<b>Acres</b>	<b>Existing Condition (1995 ESI Similarity Index % of Historic Climax Present)</b>	<b>Production Lbs/ac</b>	<b>1995 Esi %Comp.- Perennial Grass</b>	<b>1995 Esi % Bare Ground</b>
Sandy Bottom (swales)	20	1528	Good (65)	3974	63	20
Limestone Hills/Limy Upland/Volcanic Hills		4423				
Limy Slopes/Limy Upland		50				

<sup>1</sup> 31 (Fair) The score does not count Lehman Lovegrass (35% composition) because it is not native

<sup>2</sup> 32 (Fair) The score does not count Lehman Lovegrass (41% composition) because it is not native

## **EMPIRITA RANCH ECOLOGICAL SITE INVENTORY**

The Ecological Site Inventory was completed in 1994 on the Empirita Ranch. The mapping was done by Kristen Egen of the NRCS.

There are seven range sites on the ranch which all fall in the desert grassland resource area (MLRA 41-3). Soils were mapped in the mid-1980s as part of the soil survey of Eastern Pima County. The following is a brief description of each range site including current and potential condition.

**Limy Upland** - These are shallow in depth over alluvium. They are limy throughout and may have limy pans or conglomerates. The surface is gravelly. Soils mapped here are Kimrose. Slopes range from 1 to 40% on hillslopes across this unit. Elevations are 3600 to 4800 feet. Most areas of this site are in good condition. The exceptions are the south end of Smitty and the north end of Little JoAnn which are in fair condition. Also, the south 1/4 of Little Joann which is in excellent condition. The present day and potential plant communities on this site are dominated by bush muhly and black grama. Important shrubs include creosote bush, whitethorn acacia and false mesquite. In the areas in fair condition there has been a substantial invasion of sandpaper bush. The areas in excellent condition have had a wildfire in 1989 which knocked back the sandpaper bush.

**Limy Slopes** - These are shallow to deep soils over alluvium, schist, and fanglomerate. They are calcareous throughout and have lime pans. The surface is very gravelly. Soils mapped here are Powerline, Tombstone, and Deloro. Slopes range from 1 to 40 % on hillslopes with elevations from 3600 to 4800 feet. Most areas of this site are in good condition. The exception is the north half of Little JoAnn which is in fair condition. The present day and potential plant communities are dominated by sideoats grama and black grama. Major shrubs include false mesquite, yucca, ocotilla, and desert zinnia. The fair condition sites, again have sandpaper bush invading. Where fire has occurred, this has begun to resprout.

**Volcanic Hills** - These are shallow soils on basic igneous rocks, shale, and conglomerate. They are clay loam textured with many cobbles and gravels on the surface. Soils mapped here are Deloro and Pantak. Slopes range from 15 to 70% and elevations are from 4000 to 4600 feet on the ranch. All areas are in good condition except a hill near the Narrows which is in fair condition with excessive erosion. The present day potential plant communities are dominated by sideoats grama. Major shrubs are false mesquite and mesquite. The only species which is in smaller amounts than potential is plains lovegrass which is very palatable and will often decrease with slight grazing. Shrubs have increased in areas also due to the lack of fire.

**Limestone Hills** - These are shallow soils on sedimentary and metamorphic bedrock which is limy. Rock outcrop sites occur here also. The soil mapped here is Saguaro. Slopes range from 20 to 70% and elevations range from 4800 to 5100 feet. This site is in good condition. The present day and potential plant community is sideoats grama with a mix of many other grasses making up 55 to 70% of the plant community. There are many shrubs all making up less than 5% per species. This site is found in the southeast corner of the Little JoAnn pasture and much of it has burned within the last 10 years.

**Loamy Upland** - These are deep soils on loamy alluvium on fan terraces and stream terraces. They have a clay horizon near the surface. Soils here are Whitehouse, Caralampi, and Nolam. Slopes range from 1 to 15% and elevations are 3800 to 4000 feet on the ranch. This site ranges from poor condition in the Wildcat pasture where the cattle seem to camp, to fair condition with an upward trend in the Alfalfa, to good condition in the

Anderson Bull where little use occurs. The present day plant communities are mainly burroweed, yucca, and mesquite. The areas in fair to good condition have much more grama grasses. The potential for this site is mainly sideoats grama, plains lovegrass, and cane beardgrass making up 75 to 85% of the composition. This site is showing improvement.

**Sandy Bottom** - These are very young soils on sandy or gravelly alluvium in the floodplain and on the terraces. It benefits from extra moisture during runoff periods. Soils mapped here are Comoro. Slopes are 0 to 2% and elevations range from 3600 to 4000 feet on the ranch. Areas of this site are in fair condition. The present day plant communities are bermuda grass, rushes, desert willow, and mesquite. Potential for this site is 40 to 55% mixed grasses, with mesquite and willow at only 10 to 15% (the opposite is occurring now). This site encompasses Cienega Creek from the Narrows down to the highway and several smaller washes which feed into it. The combination of heavy loads of water and grazing have caused disturbance to this site.

**Deep Sandy Loam** - These soils are formed on recent sandy alluvium and have a sandy loam texture. Soils mapped here are Keysto. Slopes range from 1 to 5% and elevation are from 3600 to 4000 feet. This site is along the terraces of Cienega Creek. The site is in fair condition throughout the ranch. The present day plant community is alkali sacaton and mesquite. The potential plant community is mainly cottontop, sideoats grama, and spike dropseed. Major trees and shrubs potentially should only occur as 15 to 20% of the composition. This is a site where animals will spend much time due to the shade and nearby water. With rest rotation this site should begin to show improvement.

#### **Ecological Site Inventories for Rosetree, Vera Earl, and the Empire Mountain Areas**

The soils have been mapped for these portions of the planning area. The range sites have not been delineated, nor the sites inventoried using the Ecological Site Inventory Methodology.

Range Site Condition Empirita Ranch (1994)

Ecological Site	Study No.	Acres	Existing Condition	
			(1994 ESI Similarity Index % of Historic Climax Present)	Production Lbs/ac
Basalt Hills		<1		
Deep Sandy Loam /Sandy Bottom		1494	Good	
Loamy Bottom Subirrigated (sacaton) 41-3 (inclusion)	O'Leary (17S,17E,1)			
Sandy Bottom 41-3	O'Leary (17S,18E,7)		Poor	
	Alfalfa (17S,18E,20)		Fair	
Loamy Upland/Limy Slopes Complex 41-3	Wildcat (17S,17E,26)	893	Poor	
Loamy Upland 41-3	KA3* (17S,18E,29) (Smitty #5)	115	Good	
Limestone Hills/Limy Upland/Volcanic Hills		6		
Limestone Hills 41-3	(18S,18E,14) (Little JoAnn)	920	Good	
Sandy Bottom-Subirrigated 41-3	Narrows (18S,18E,6)	5	Fair	
Volcanic Hills 41-3	Anderson (17S,18E,15)	416	Good	
Volcanic Hills/Limy Slopes	Wildcat (17S,17E,34)	3586	Good	
Limy Upland/Limy Slopes Complex 41-3	KA1* (17S,17E,13) (O'Leary #2)	19370	Good	
	(17S,18E,21)		Excellent	
Limy Upland	Smitty (17S,18E,33)		Fair	
Limy Upland	O'Leary (17S,17E,2)		Excellent	
Limy Upland	Narrows (18S,18E,5)		Excellent	
	House (17S,18E,20)		Good	

Range Site Condition Empirita Ranch (1994), continued

Ecological Site	Study No.	Acres	Existing Condition (1994 ESI Similarity Index % of Historic Climax Present)	Production Lbs/ac
	KA2* (17S,17E,25) (Wildcat #3)		Good	
Limy Upland	Crystal (17S,18E,26)		Good	
Limy Upland	Smitty (17S,18E,29)		Good	
Limy Slopes	O'Leary (17S,17E,14)		Good	
Limy Slopes	JoAnn (18S,18E,15)		Fair	
	JoAnn (18S,18E,3)		Fair	
	Wildcat (17S,18E,30)		Good	

## 4. RIPARIAN AREA CONDITIONS AND MANAGEMENT

### Riparian Area Condition Evaluation (RACE) 1989/1993/2000 Summaries for Cienega Creek

Segment			1988/89		1993		2000	
Number	Location	BLM Length	Score	Rating	Score	Rating	Score	Rating
59AA	Bootlegger to Narrows	1.5 mi	-	-	9	U	15	S
59A	Narrows to Apache Canyon	0.3	10	U	13	S	14	S
59B	Apache to Fresno Canyon	0.3	13	S	14	S	14	S
59C	Fresno Canyon to Bedrock Falls	1.6	16	S	15	S	16	S
59D	Bedrock Falls to Pump Canyon	0.4	12	S	13	S	16	S
59E	Pump Canyon to Cienega Falls	0.6	13	S	11	U	14	S
59F	Cienega Falls to Mattie Canyon	0.5	11	U	12	S	15	S
59G	Mattie Canyon to Cold Spring	0.5	13	S	16	S	16	S
59H	Cold Spring to Agricultural Fields	1.0	11	U	13	S	11	U
59I	Agricultural Fields to Canal	1.7	10	U	15	S	12	S
59J	Canal to Oak Tree Canyon	0.9	9	U	12	S	15	S
59K	Oak Tree to Spring Water Canyon	0.3	9	U	12	S	12	S
59L	Spring Water to Gardner Canyon	1.0	10	U	12	S	15	S
59M	Gardner to Head Waters	1.3	13	S	9	U	16	S
59O	near Oil Well Canyon	0.6	11	U	-	-	11	U
<b>Mean Score</b>		<b>12.5 mi</b>	<b>11.5</b>	<b>U</b>	<b>12.8</b>	<b>S</b>	<b>14.1</b>	<b>S</b>



Riparian Proper Functioning Condition Assessment and Associated Management Actions 2000  
 Summary for Cienega Creek

<b>Segment Number</b>	<b>Segment Location</b>	<b>Rating</b>	<b>Year Management Implemented</b>	<b>Management Action</b>
59AA	Bootlegger to Narrows	PFC	late 2000	Riparian Fencing
59A	Narrows to Apache Canyon	FAR	late 2000	Riparian Fencing
59B	Apache to Fresno Canyon	FAR	late 2000	Riparian Fencing
59C	Fresno Canyon to Bedrock Falls	PFC	late 2000	Riparian Fencing
59D	Bedrock Falls to Pump Canyon	PFC	1990	Riparian Fencing
59E	Pump Canyon to Cienega Falls	FAR	1990	Riparian Fencing
59F	Cienega Falls to Mattie Canyon	PFC	1990	Riparian Fencing
			1999	Develop upland water and close water gap
59G	Mattie Canyon to Cold Spring	PFC	1990	Riparian Fencing
			1999	Stream restoration upstream is returning flood flows
59H	Cold Spring to Agricultural Fields	FAR	1993	Stream restoration project
59I	Agricultural Fields to Canal	FAR	1999	Stream restoration project
59J	Canal to Oak tree Canyon	PFC	1995	Riparian Fencing
59K	Oak Tree to Spring Water Canyon	PFC	1995	Riparian Fencing
59L	Spring Water to Gardner Canyon	PFC	1995	Riparian Fencing
59M	Gardner to Head Waters	PFC	1995	Riparian Fencing

## 5. CHECKLIST OF BIRDS WITHIN THE EMPIRE-CIENEGA PLANNING AREA

### Birds of the Empire-Cienega Planning Area

Common Name (FAMILY)	Species	Occurrence
<b>PODICIPEDIDAE</b>		
Pied-billed Grebe	<i>Podilymbus podiceps</i>	Uncommon
<b>PELICANIDAE</b>		
Brown Pelican	<i>Pelicanus occidentalis</i>	Vagrant
<b>ARDEIDAE</b>		
Great Blue Heron	<i>Ardea herodias</i>	Uncommon
Great Egret	<i>Ardea albus</i>	Uncommon
Snowy Egret	<i>Egretta thula</i>	Uncommon migrant
Cattle Egret	<i>Bubulcus ibis</i>	Uncommon migrant
Green Heron	<i>Butorides virescens</i>	Uncommon migrant ?
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	Uncommon migrant
<b>THRESKIORNITHIDAE</b>		
White-faced Ibis	<i>Plegadis chihi</i>	Uncommon migrant
<b>ANATIDAE</b>		
Greater White-fronted Goose	<i>Anser albifrons</i>	Rare migrant
**Mandarin Duck	<i>Aix galericulata</i>	Exotic species**
Green-winged Teal	<i>Anas crecca</i>	Common migrant and wintering species
Mallard	<i>Anas platyrhynchos</i>	Uncommon migrant and wintering species
Mexican Duck	<i>Anas platyrhynchos diazi</i>	Breeding?
Blue-winged Teal	<i>Anas discors</i>	Uncommon migrant
Cinnamon Teal	<i>Anas cyanoptera</i>	Uncommon migrant
American Wigeon	<i>Anas americana</i>	Uncommon migrant or wintering species
Gadwall	<i>Anas strepera</i>	Uncommon migrant or wintering species
Ring-necked Duck	<i>Aythya collaris</i>	Uncommon migrant or winter visitor to ponds
Bufflehead	<i>Bucephala albeola</i>	Uncommon migrant
Hooded Merganser	<i>Lophodytes cucullatus</i>	Uncommon or rare migrant
<b>CATHARTIDAE</b>		
Turkey Vulture	<i>Cathartes aura</i>	Common summer visitor
<b>ACCIPITRIDAE</b>		
Osprey	<i>Pandion haliaetus</i>	Uncommon migrant
White-tailed Kite	<i>Elanus leucurus</i>	Rare resident species
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Rare migrant or winter species
Northern Harrier	<i>Circus cyaneus</i>	Common wintering species
Sharp-shinned Hawk	<i>Accipiter striatus</i>	Uncommon migrant and wintering species
Cooper's Hawk	<i>Accipiter cooperii</i>	Uncommon resident species
Northern Goshawk	<i>Accipiter gentilis</i>	Accidental
Harris' Hawk	<i>Parabuteo unicinctus</i>	Accidental
Gray Hawk	<i>Buteo nitidus</i>	Uncommon summer
Swainson's Hawk	<i>Buteo swainsoni</i>	Uncommon summer
Zone-tailed Hawk	<i>Buteo albonotatus</i>	Uncommon summer
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Common resident specie
Ferruginous Hawk	<i>Buteo regalis</i>	Rare winter
Golden Eagle	<i>Aquila chrysaetos</i>	Uncommon visitor

Birds of the Empire-Cienega Planning Area, continued

Common Name (FAMILY)	Species	Occurrence
<b>FALCONIDAE</b>		
American Kestrel	<i>Falco sparverius</i>	Common resident species
Merlin	<i>Falco columbarius</i>	Uncommon migrant and wintering species
Peregrine Falcon	<i>Falco peregrinus</i>	Uncommon migrant
Prairie Falcon	<i>Falco mexicanus</i>	Uncommon resident
<b>PHASIANIDAE</b>		
Montezuma Quail	<i>Cyrtonyx montezumae</i>	Uncommon resident
Scaled Quail	<i>Callipepla squamata</i>	Fairly common resident
Gambel's Quail	<i>Callipepla gambelii</i>	Common resident
<b>RALLIDAE</b>		
Virginia Rail	<i>Rallus limicola</i>	Uncommon resident species
Sora	<i>Porzana carolina</i>	Rare in winter
Common Moorhen	<i>Gallinula chloropus</i>	Rare migrant?
American Coot	<i>Fulica americana</i>	Uncommon migrant and wintering species
<b>CHARADRIDAE</b>		
Killdeer	<i>Charadrius vociferus</i>	Fairly common breeding species
<b>SCOLOPACIDAE</b>		
Solitary Sandpiper	<i>Tringa solitaria</i>	Uncommon fall migrant (rare in spring?)
Western Sandpiper	<i>Calidris mauri</i>	Uncommon fall migrant
Common Snipe	<i>Gallinago gallinago</i>	Uncommon winter resident
Wilson's Phalarope	<i>Phalaropus tricolor</i>	Uncommon fall migrant
<b>CUCULIDAE</b>		
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Uncommon nesting species
Greater Roadrunner	<i>Geococcyx californianus</i>	Uncommon resident species
<b>COLUMBIDAE</b>		
Rock Dove	<i>Columba livia</i>	Uncommon resident?
White-winged Dove	<i>Zenaida asiatica</i>	Common summer resident
Mourning Dove	<i>Zenaida macroura</i>	Common resident
Inca Dove	<i>Columbina inca</i>	Uncommon resident
Common Ground-Dove	<i>Columbigallina passerina</i>	Uncommon irregular resident
<b>TYTONIDAE</b>		
Barn Owl	<i>Tyto alba</i>	Uncommon resident
<b>STRIDGIDAE</b>		
Western Screech-Owl	<i>Otus kennicottii</i>	Uncommon resident species
Flammulated Owl	<i>Otus flammeolus</i>	Hypothetical
Great Horned Owl	<i>Bubo virginianus</i>	Common resident
Ferruginous Pygmy Owl	<i>Glaucidium brasilianum</i>	Hypothetical
Elf Owl	<i>Micrathene whitneyi</i>	Uncommon nesting species
Burrowing Owl	<i>Speotyto cunicularia</i>	Uncommon nesting species
<b>CAPRIMULGIDAE</b>		
Lesser Nighthawk	<i>Chordeiles acutipennis</i>	Uncommon nesting species
Common Nighthawk	<i>Chordeiles minor</i>	Uncommon summer visitor
Common Poorwill	<i>Phalaenoptilus nuttallii</i>	Uncommon breeding species
<b>APODIDAE</b>		
Vaux's Swift	<i>Chaetura vauxi</i>	Uncommon fall migrant
White-throated Swift	<i>Aeronautes saxatalis</i>	Uncommon year-round visitor

Birds of the Empire-Cienega Planning Area, continued

Common Name (FAMILY)	Species	Occurrence
<b>TROCHILIDAE</b>		
Broad-billed Hummingbird	<i>Cyanthus latirostris</i>	Post-breeding visitor
Plain-capped Starthroat	<i>Helimaster constantii</i>	Rare visitor
Black-chinned Hummingbird	<i>Archilochus alexandri</i>	Fairly common summer
Anna's Hummingbird	<i>Calypte anna</i>	Uncommon migrant and possible breeding species
Costa's Hummingbird	<i>Calypte costae</i>	Uncommon migrant
Calliope Hummingbird	<i>Stellula calliope</i>	Uncommon migrant
Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>	Uncommon migrant
Rufous Hummingbird	<i>Selasphorus rufus</i>	Uncommon migrant Fairly common migrant
<b>TROGONIDAE</b>		
Elegant Trogon	<i>Trogon elegans</i>	Accidental
<b>ALCIDINIDAE</b>		
Belted Kingfisher	<i>Ceryle alcyon</i>	Uncommon migrant and winter resident
Green Kingfisher	<i>Chloroceryl americana</i>	Rare visitor
<b>PICIDAE</b>		
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	Fairly common resident
Gila Woodpecker	<i>Melanerpes uropygialis</i>	Common resident
Red-naped Sapsucker	<i>Sphyrapicus nuchalis</i>	Uncommon migrant and winter resident
Ladder-backed Woodpecker	<i>Picoides scalaris</i>	Common resident
Hairy Woodpecker	<i>Picoides villosus</i>	Accidental
Northern Flicker	<i>Colaptes auratus</i>	Red-shafted form is common resident
<b>TYRANNIDAE</b>		
Northern Beardless-Tyrannulet	<i>Camptostoma imberbe</i>	Uncommon breeding species
Olive-sided Flycatcher	<i>Contopus borealis</i>	Uncommon migrant
Western Wood-Pewee	<i>Contopus sordidulu</i>	Uncommon nesting species
Willow Flycatcher	<i>Empidonax traillii</i>	Uncommon migrant
Hammond's Flycatcher	<i>Empidonax hammondii</i>	Uncommon migrant and winter resident
Dusky Flycatcher	<i>Empidonax oberholseri</i>	Uncommon migrant and winter resident
Gray Flycatcher	<i>Empidonax wrightii</i>	Uncommon migrant and winter resident
Western Flycatcher		
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	Uncommon migrant
Cordilleran Flycatcher	<i>Empidonax occidentalis</i>	Uncommon migrant
Black Phoebe	<i>Sayornis nigricans</i>	Common nesting species
Eastern Phoebe	<i>Sayornis phoebe</i>	Rare migrant and winter
Say's Phoebe	<i>Sayornis saya</i>	Common nesting species
Vermilion Flycatcher	<i>Pyrocephalus rubinus</i>	Common and conspicuous nesting species
Dusky-capped Flycatcher	<i>Myiarchus tuberculifer</i>	Uncommon migrant
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	Common nesting species
Brown-crested Flycatcher	<i>Myiarchus tyrannulus</i>	Uncommon nesting species
Tropical Kingbird	<i>Tyrannus melancholicus</i>	Hypothetical
Cassin's Kingbird	<i>Tyrannus vociferans</i>	Common nesting species
Western Kingbird	<i>Tyrannus verticalis</i>	Common nesting species
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Accidental visitor
<b>ALAUDIDAE</b>		
Horned Lark	<i>Eremophila alpestris</i>	Common nesting species

Birds of the Empire-Cienega Planning Area, continued

Common Name (FAMILY)	Species	Occurrence
<b>HIRUDINIDAE</b>		
Purple Martin	<i>Progne subis</i>	Uncommon migrant
Tree Swallow	<i>Tachycineta bicolor</i>	Uncommon migrant
Violet-green Swallow	<i>Tachycineta thalassina</i>	Common migrant and summer visitor
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Common breeding species
Bank Swallow	<i>Riparia riparia</i>	Uncommon migrant
Cliff Swallow	<i>Hirundo pyrrhonota</i>	Common nesting species
Barn Swallow	<i>Hirundo rustica</i>	Common nesting species
<b>CORVIDAE</b>		
Steller's Jay	<i>Cyanocitta stelleri</i>	Rare winter visitor
Scrub Jay	<i>Aphelocoma californica</i>	Rare visitor
Mexican Jay	<i>Aphelocoma ultramarina</i>	Uncommon resident
Chihuahuan Raven	<i>Corvus cryptoleucus</i>	Uncommon resident
Common Raven	<i>Corvus corax</i>	Uncommon resident
<b>PARIDAE</b>		
Bridled Titmouse	<i>Parus wollweberi</i>	Uncommon resident
<b>REMIZIDAE</b>		
Verdin	<i>Auriparus flaviceps</i>	Uncommon resident
<b>AEGITHALIDAE</b>		
Bushtit	<i>Psaltriparus minimus</i>	Uncommon resident
<b>SITTIDAE</b>		
White-breasted Nuthatch	<i>Sitta carolinensis</i>	Uncommon resident
<b>CERTHIIDAE</b>		
Brown Creeper	<i>Certhia americana</i>	Uncommon resident
<b>TROGLODYTIDAE</b>		
Cactus Wren	<i>Campylorhynchus</i>	Common resident
Rock Wren	<i>Brunneicapillum</i>	Uncommon resident
Canyon Wren	<i>Salpinctes obsoletus</i>	Uncommon resident
Bewick's Wren	<i>Catherpes mexicanus</i>	Common resident
House Wren	<i>Thryomanes bewickii</i>	Common migrant, uncommon winter
Winter Wren	<i>Troglodytes aedon</i>	Rare in winter
Marsh Wren	<i>Troglodytes troglodytes</i>	Uncommon migrant and winter
	<i>Cistothorus palustris</i>	
<b>MUSICAPIDAE</b>		
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	Uncommon migrant
Black-tailed Gnatcatcher	<i>Polioptila melanura</i>	Uncommon resident
Ruby-crowned Kinglet	<i>Regulus calendula</i>	Common winter
Western Bluebird	<i>Sialia mexicana</i>	Rare or eruptive in winter
Mountain Bluebird	<i>Sialia currucoides</i>	Eruptive in winter
Townsend's Solitaire	<i>Myadestes townsendi</i>	Eruptive in winter and migration
Swainson's Thrush	<i>Catharus ustulatus</i>	Uncommon migrant
Hermit Thrush	<i>Catharus guttatus</i>	Uncommon migrant and winter
American Robin	<i>Turdus migratorius</i>	Uncommon visitor
<b>MIMIDAE</b>		
Northern Mockingbird	<i>Mimus polyglottos</i>	Common resident
Sage Thrasher	<i>Oreoscoptes montanus</i>	Uncommon winter
Curve-billed Thrasher	<i>Toxostoma curvirostre</i>	Common resident
Crissal Thrasher	<i>Toxostoma crissale</i>	Uncommon resident

Birds of the Empire-Cienega Planning Area, continued

Common Name (FAMILY)	Species	Occurrence
<b>MOTACILLIDAE</b>		
American Pipit	<i>Anthus rubescens</i>	Uncommon
Sprague's Pipit	<i>Anthus spragueii</i>	Uncommon
<b>PTILOGONATIDAE</b>		
Phainopepla	<i>Phainopepla nitens</i>	Common permanent resident
<b>BOMBYCILLIDAE</b>		
Cedar Waxwing	<i>Bombycilla cedrorum</i>	Uncommon usually late winter through early summer
<b>LANIIDAE</b>		
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Uncommon resident
Northern Shrike	<i>Lanius excubitor</i>	Accidental
<b>STURNIDAE</b>		
European Starling	<i>Sturnus vulgaris</i>	Common resident
<b>VIREONIDAE</b>		
Bell's Vireo	<i>Vireo bellii</i>	Uncommon summer
Gray Vireo	<i>Vireo vicinior</i>	Hypothetical
Solitary Vireo	<i>Vireo solitarius</i>	Uncommon migrant
Hutton's Vireo	<i>Vireo huttoni</i>	Uncommon visitor
Warbling Vireo	<i>Vireo gilvus</i>	Common migrant
<b>EMBERIZIDAE</b>		
Tennessee Warbler	<i>Vermivora peregrina</i>	Accidental
Orange-crowned Warbler	<i>Vermivora celata</i>	Uncommon migrant
Nashville Warbler	<i>Vermivora ruficapilla</i>	Uncommon migrant
Virginia's Warbler	<i>Vermivora virginiae</i>	Uncommon migrant
Lucy's Warbler	<i>Vermivora luciae</i>	Common summer
Yellow Warbler	<i>Dendroica petechia</i>	Common summer
Yellow-rumped Warbler	<i>Dendroica coronata</i>	Common winter and migrant
Black-throated Gray Warbler	<i>Dendroica nigrescens</i>	Uncommon migrant
Townsend's Warbler	<i>Dendroica townsendi</i>	Uncommon migrant
Hermit Warbler	<i>Dendroica occidentalis</i>	Uncommon migrant
American Redstart	<i>Setophaga ruticilla</i>	Rare migrant
Northern Waterthrush	<i>Seiurus noveboracensis</i>	Uncommon migrant
Common Yellowthroat	<i>Geothlypis trichas</i>	Common summer, uncommon winter
MacGillivray's Warbler	<i>Opornis tolmiei</i>	Uncommon migrant
Hooded Warbler	<i>Wilsonia citrina</i>	Rare migrant
Wilson's Warbler	<i>Wilsonia pusilla</i>	Common migrant
Painted Redstart	<i>Myioborus pictus</i>	Rare visitor
Yellow-breasted Chat	<i>Icteria virens</i>	Common summer
Hepatic Tanager	<i>Piranga flava</i>	Rare migrant
Summer Tanager	<i>Piranga rubra</i>	Common summer
Western Tanager	<i>Piranga ludoviciana</i>	Common migrant
Northern Cardinal	<i>Cardinalis cardinalis</i>	Uncommon resident
Pyrrhuloxia	<i>Cardinalis sinuatus</i>	Uncommon resident
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	Rare migrant
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	Common migrant
Blue Grosbeak	<i>Guiraca caerulea</i>	Common summer
Lazuli Bunting	<i>Passerina amoena</i>	Common migrant
Indigo Bunting	<i>Passerina cyanea</i>	Uncommon migrant or uncommon summer

Birds of the Empire-Cienega Planning Area, continued

Common Name (FAMILY)	Species	Occurrence
<b>EMBERIZIDAE</b>		
Varied Bunting	<i>Passerina versicolor</i>	Uncommon summer
Painted Bunting	<i>Passerina ciris</i>	Rare migrant
Dickcissel	<i>Spiza americana</i>	Rare migrant
Green-tailed Towhee	<i>Pipilo chlorurus</i>	Common migrant and winter
Spotted Towhee	<i>Pipilo maculatus</i>	Uncommon winter
Canyon Towhee	<i>Pipilo fuscus</i>	Common resident
Abert's Towhee	<i>Pipilo aberti</i>	Common resident
Botteri's Sparrow	<i>Aimophila botterii</i>	Uncommon summer
Cassin's Sparrow	<i>Aimophila cassinii</i>	Uncommon summer/A few in winter
Rufous-winged Sparrow	<i>Aimophila carpalis</i>	Irregular resident
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>	Uncommon resident
Chipping Sparrow	<i>Spizella passerina</i>	Common winter
Brewer's Sparrow	<i>Spizella breweri</i>	Common winter
Vesper Sparrow	<i>Poocetes gramineus</i>	Common winter
Lark Bunting	<i>Calamospiza melanocorys</i>	Uncommon winter/Eruptive
Lark Sparrow	<i>Chondestes grammacus</i>	Uncommon resident
Black-throated Sparrow	<i>Amphispiza bilineata</i>	Uncommon resident
Savannah Sparrow	<i>Passerculus sandwichensis</i>	Uncommon winter
Baird's Sparrow	<i>Ammodramus bairdii</i>	Uncommon winter
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Uncommon summer and uncommon winter
Song Sparrow	<i>Melospiza melodia</i>	Uncommon resident
Lincoln's Sparrow	<i>Melospiza lincolni</i>	Common winter
Swamp Sparrow	<i>Melospiza georgiana</i>	Rare in winter
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	Common winter
Dark-eyed Junco	<i>Junco hyemalis</i>	Uncommon winter
McCown's Longspur	<i>Calcarius mccownii</i>	Rare in winter
Chestnut-collared Longspur	<i>Calcarius ornatus</i>	Uncommon in winter
Bobolink	<i>Dolichonyx oryzivorus</i>	Rare migrant
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Uncommon resident
Eastern Meadowlark	<i>Sturnella magna</i>	Common resident
Western Meadowlark	<i>Sturnella neglecta</i>	Uncommon winter
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	Uncommon summer
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	Uncommon winter
Great-tailed Grackle	<i>Quiscalus mexicanus</i>	Uncommon visitor in spring
Bronzed Cowbird	<i>Molothrus aeneus</i>	Uncommon summer
Brown-headed Cowbird	<i>Molothrus ater</i>	Common summer
Hooded Oriole	<i>Icterus cucullatus</i>	Uncommon summer
Streak-backed Oriole	<i>Icterus pustulatus</i>	Accidental
Bullock's Oriole	<i>Icterus bullockii</i>	Uncommon summer
Scott's Oriole	<i>Icterus parisorum</i>	Uncommon summer
<b>FRINGILLIDAE</b>		
House Finch	<i>Carpodacus mexicanus</i>	Common resident
Pine Siskin	<i>Carduelis pinus</i>	Uncommon winter
Lesser Goldfinch	<i>Carduelis psaltria</i>	Common resident
Lawrence's Goldfinch	<i>Carduelis lawrencei</i>	Eruptive in fall and winter
American Goldfinch	<i>Carduelis tristis</i>	Uncommon in winter
<b>PASSERIDAE</b>		
House Sparrow	<i>Passer domesticus</i>	Common resident

## Birds of the Empire-Cienega Planning Area, concluded

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### Abundance and Residence Categories:

**Common:** to be expected in proper habitat. Should be encountered on most visits during proper season.

**Uncommon:** may or may not be encountered. Includes species that are present in low numbers and species that are present in some years but not in others.

**Rare:** includes species that occur some years and in very small numbers.

**Accidental:** includes species that have occurred only once and are not likely to occur again.

**Hypothetical:** includes species for which documentation is lacking or questionable.

**Resident:** occurs year-round.

**Summer:** a neotropical migrant. A species that breeds at the Empire Ranch but is absent during the winter.

**Migrant:** a species encountered during annual passage.

**Winter:** a species that breeds farther north and spends the winter in the planning area.

**Irruptive:** species such as corvids that occur outside their normal range or habitat in response to resource fluctuations.

**Irregular:** a species that uses a site without an established pattern.



## 6. MAMMALS WITHIN THE EMPIRE-CIENEGA PLANNING AREA

### Mammals of the Empire-Cienega Resource Conservation Area

Common Name (FAMILY)	Scientific Name ( <i>Species</i> )	Source
<b>SORICIDAE</b>		
Desert Shrew	<i>Notiosorex crawfordi crawfordi</i>	3
<b>PHYLLOSTOMIDAE</b>		
Lesser long-nosed Bat	<i>Leptonycteris curasoae yerbabuenae</i>	1, 3
Mexican long-tongued bat	<i>Choeronycteris mexicana</i>	
<b>VESPERTILIONIDAE</b>		
Cave Myotis	<i>Myotis velifer brevis</i>	1,3
Fringes Myotis	<i>Myotis thysanodes thysanodes</i>	1,3
California Myotis	<i>Myotis californicus californicus</i>	1,3
Southwestern Myotis	<i>Myotis auriculus</i>	1
Western Pipistrelle	<i>Pipistrellus hesperus</i>	3
Big Brown Bat	<i>Eptesicus fuscus pallidus</i>	1,3
Red Bat	<i>Lasiurus borealis</i>	1
Hoary Bat	<i>Lasiurus cinereus</i>	1
Townsend's big-eared Bat	<i>Plecotus townsendii pallescens</i>	3
Pallid Bat	<i>Antrozous pallidus pallidus</i>	1,3
<b>LEPORIDAE</b>		
Desert Cottontail	<i>Sylvilagus auduboni arizonae</i>	1,3
Black-tailed Jackrabbit	<i>Lepus californicus eremicus</i>	1,3
Antelope Jackrabbit	<i>Lepus alleni</i>	1
<b>SCIURIDAE</b>		
Harris' Antelope Squirrel	<i>Ammospermophilus harrisii</i>	3
Rock Squirrel	<i>Spermophilus variegatus</i>	1,3
Spotted ground Squirrel	<i>Spermophilus spilosoma</i>	4
<b>GEOMYIDAE</b>		
Botta's Pocket Gopher	<i>Thomomys bottae proximus</i>	3
Southern Pocket Gopher	<i>Thomomys umbrinus</i>	2
<b>HETEROMYIDAE</b>		
Silky Pocket Mouse	<i>Perognathus flavus</i>	3
Bailey's Pocket Mouse	<i>Perognathus baileyi</i>	3
Hispid Pocket Mouse	<i>Perognathus hispidus</i>	3,4
Desert Pocket Mouse	<i>Perognathus penicillatus</i>	
Rock Pocket Mouse	<i>Perognathus intermedius</i>	3
Banner-tailed Kangaroo Rat	<i>Dipodomys spectabilis</i>	1,4
Merriam's Kangaroo Rat	<i>Dipodomys merriami</i>	3,4
Ord's Kangaroo Rat	<i>Dipodomys ordii</i>	3

Mammals of the Empire-Cienega Resource Conservation Area, continued

Common Name (FAMILY)	Scientific Name (Species)	Source
<b>MURIDAE</b>		
Plains Harvest Mouse	<i>Reithrodontomys montanus</i>	3
Western Harvest Mouse	<i>Reithrodontomys megalotis</i>	3
Fulvous Harvest Mouse	<i>Reithrodontomys fulvescens</i>	2,3
Cactus Mouse	<i>Peromyscus eremicus</i>	3
Deer Mouse	<i>Peromyscus maniculatus</i>	1,3
Brush Mouse	<i>Peromyscus boylii</i>	3
White-footed Mouse	<i>Peromyscus leucopus</i>	1
Northern Pygmy Mouse	<i>Baiomys taylori</i>	1,2,3
Northern Grasshopper	<i>Onychomys leucogaster</i>	3
Southern Grasshopper	<i>Onychomys torridus</i>	3
Hispid Cotton Rat	<i>Sigmodon hispidus</i>	3
Arizona Cotton	<i>Sigmodon arizonae</i>	1,4
Fulvous Cotton	<i>Sigmodon fulviventor</i>	3
Yellow-nosed cotton Rat	<i>Sigmodon ochrognathus</i>	2,3
Least Cotton Rat	<i>Sigmodon minimus</i>	5
White-throated Wood Rat	<i>Neotoma albigula</i>	1,3
<b>ERETHRIZONTIDAE</b>		
Porcupine	<i>Erethizon dorsatum</i>	1
<b>CANIDAE</b>		
Coyote	<i>Canis latrans</i>	1,3
Gray Fox	<i>Urocyon cinereoargenteus</i>	1,3
<b>PROCYONIDAE</b>		
Ringtail	<i>Bassariscus astutus</i>	1,3
Raccoon	<i>Procyon lotor</i>	1,3
Coati	<i>Nasua nasua</i>	1,3
<b>MUSTELIDAE</b>		
Badger	<i>Taxidea Taxus</i>	1
Striped Skunk	<i>Mephitis mephitis</i>	1,3
Hooded Skunk	<i>Mephitis macroura</i>	1
<b>FELIDAE</b>		
Mountain Lion	<i>Felis concolor</i>	1
Bobcat	<i>Felis rufus</i>	1,3
<b>TAYASSUIDAE</b>		
Collared Peccary (javelina)	<i>Tayassu tajacu</i>	1,3
<b>CERVIDAE</b>		
Mule Deer	<i>Odocoileus hemionus</i>	1,3
White-tailed Deer	<i>Odocoileus virginianus</i>	1,3
<b>ANTILOCAPRIDAE</b>		
Chihuahuan Pronghorn	<i>Antilocapra americana mexicana</i>	1,3

## Mammals of the Empire-Cienega Resource Conservation Area, concluded

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### Source:

1. BLM, Tucson Office Files (1988-89)
2. Arizona Game and Fish Department Nongame Heritage Database (1964-85)
- C. Rosemont Inventory (1975-76): Davis, R. and Callahan, J.R., editors (ca. 1977). An Environmental Inventory of the Rosemont Area in Southern Arizona, Vol 1: the Present Environment. Unpublished contract reports to Anamax Mining Corp. 278p.
- D. Anderson, J.E.(1982). Hunting area preferences of raptors in rangelands. Unpublished M.S. Thesis, University of Arizona, Tucson. 29p.
- E. Bock, J.H., C.E. Bock, and J.R. McNight, 1976. A study of the effects of grassland fires at the research ranch in southeastern Arizona. Journal of the Arizona Academy of Science. Vol II: 49-57.

## 7. ANNOTATED CHECKLIST OF FISH, AMPHIBIANS, AND REPTILES WITHIN THE EMPIRE-CIENEGA PLANNING AREA

Fish, Amphibians, and Reptiles of the Empire-Cienega Resource Conservation Area

Common Name (FAMILY)	Scientific Name ( <i>Species</i> )	Source
<b>CYPRINIDAE</b>		
Gila chub	<i>Gila intermedia</i>	1,2
Longfin dace	<i>Agosia chrysogaster</i>	1,2
Goldfish (Babocomari)	<i>Carassius auratus</i>	5
<b>ICTALURIDAE</b>		
Yellow bullhead ((Babocomari)	<i>Ameiurus natalis</i>	
<b>POECILIIDAE</b>		
Gila Topminnow	<i>Poeciliopsis occidentalis occidentalis</i>	1,2
Mosquitofish (Babocomari)		1
<b>CENTRARCHIDAE</b>		
Largemouth Bass (Babocomari)	<i>Micropterus salmoides</i>	4,5
Green Sunfish (Babocomari)	<i>Lepomis cyanellus</i>	5
Bluegill (Babocomari)	<i>Lepomis macrochirus</i>	5
<b>PELOBATIDAE</b>		
Couch's spadefoot	<i>Scaphiopus couchii</i>	1,3
Southern spadefoot	<i>Scaphiopus multiplicatus</i>	1
<b>BUFONIDAE</b>		
Sonoran Desert Toad	<i>Bufo alvarius</i>	3
Great Plain's Toad	<i>Bufo cognatus</i>	3
Red-spotted Toad	<i>Bufo punctatus</i>	3
<b>RANIDAE</b>		
Bullfrog	<i>Rana catesbeiana</i>	1
Lowland leopard frog	<i>Rana yavapaiensis</i>	1
Chiricahua leopard frog	<i>Rana chiricahuensis</i>	1
<b>KINOSTERNIDAE</b>		
Sonoran mud turtle	<i>Kinosternon sonoriense</i>	1
<b>EMYDIDAE</b>		
Desert Box turtle	<i>Terrapene ornata luteola</i>	1
<b>IGUANIDAE</b>		
Common collared lizard	<i>Crotaphytus collaris</i>	1,3
Lesser Earless lizard	<i>Holbrookia maculata</i>	1,3
Greater Earless lizard	<i>Holbrookia texana</i>	3
Clark's spiny lizard	<i>Sceloporus clarkii</i>	1,3
Tree lizard	<i>Urosaurus ornatus</i>	1,3
Short-horned lizard	<i>Phrynosoma douglassi</i>	3
Regal horned lizard	<i>Phrynosoma solare</i>	1,3

Fish, Amphibians, and Reptiles of the Empire-Cienega Resource Conservation Area, continued

Common Name (FAMILY)	Scientific Name (Species)	Source
<b>SCINCIDAE</b>		
Great Plains skink	<i>Eumeces obsoletus</i>	1
<b>TEIIDAE</b>		
Desert grassland whiptail	<i>Cnemidophorus uniparens</i>	1,3
Giant spotted whiptail	<i>Cnemidophorus burti</i>	3
Arizona desert whiptail	<i>Cnemidophorus tigris</i>	3
Sonoran spotted whiptail	<i>Cnemidophorus sonorae</i>	3
<b>ANGUIDAE</b>		
Madrean alligator lizard	<i>Gerrhonotus kingii</i>	1,3
<b>HELODERMATIDAE</b>		
Gila monster	<i>Heloderma suspectum</i>	1,3
<b>COLUBRIDAE</b>		
Ringneck snake	<i>Diadophis punctatus</i>	1,3
Big Bend Patch-nosed snake	<i>Salvadora hexalepis deserticola</i>	1,3
Sonoran whipsnake	<i>Masticophis bilineatus</i>	3
Coachwhip	<i>Masticophis flagellum</i>	3
Gopher snake	<i>Pituophis melanoleucus</i>	3
Green rat snake	<i>Elaphe triaspis</i>	2
Common kingsnake	<i>Lampropeltis getulus</i>	1
Checkered garter snake	<i>Thamnophis marcianus</i>	1
Mexican garter snake	<i>Thamnophis eques</i>	1
Black-necked garter snake	<i>Thamnophis cyrtopsis</i>	1,3
Chihuahuan hook-nosed snake	<i>Gyalopion canum</i>	2,3
Night snake	<i>Hypsiglena torquata</i>	3
Lyre snake	<i>Trimorphodon biscutatus</i>	3
Southwestern black-headed snake	<i>Tantilla hobartsmithi</i>	3
<b>VIPERIDAE</b>		
Western diamondback rattlesnake	<i>Crotalus atrox</i>	1
Mojave rattlesnake	<i>Crotalus scutulatus</i>	1,3
Rock rattlesnake	<i>Crotalus lepidus</i>	2
Black-tailed rattlesnake	<i>Crotalus molossus</i>	3

Sources:

1. BLM, Field Office Files
2. Arizona Game and Fish Heritage Database
3. Davis, R. and Callahan J.R., editors (N.D.) An environmental inventory of the Rosemont area in southern Arizona, Vol 1: The present environment unpublished contract report to Anamax Mining Corp. 278p.
4. Sheldon, D.L. and D.A. Hendrickson., 1988. Report of the October Fish Count. Arizona Game and Fish Department. Nongame Branch. Phoenix, Arizona 85023.
5. Minckley, W.L., 1985. Native fishes and natural aquatic habitats in U.S. Fish and Wildlife Service Region 2 west of Continental Divide. Report to U.S. Fish and Wildlife Service, Albuquerque, New Mexico, Department of Zoology, Arizona State University, Tempe, Arizona. 158p.

## 8. WILLOW FLYCATCHER HABITAT ASSESSMENT AND SURVEYS

Southwestern Willow Flycatcher Habitat Classification 2000 Summaries for Cienega Creek\* and Tributaries\*\*

Segment				Classification	Patch Size	Attributes				
Number	Location	Date (2000)	Length	S;P;N <sup>1</sup>	Acres	H <sup>2</sup>	W <sup>3</sup>	C.D. <sup>4</sup>	U.D. <sup>5</sup>	P.S. <sup>6</sup>
59AA	Bootlegger to Narrows	7/12	1.5mi	P		S	P	P	S	P
59A	Narrows to Apache Canyon	7/12	.3	S		S	S	S	S	S
59B	Apache to Fresno Canyon	7/12	.3	S		S	S	S	S	S
59C	Fresno Canyon to Bedrock Falls	7/12	1.6	S		S	S	S	S	S
59E	Pump Canyon to Cienega Falls	7/11	.6	P		S	S	S	P	S
59F	Cienega Falls to Mattie Canyon	7/11	.5	P		S	S	S	P	S
59G	Mattie Canyon to Cold Springs	7/11	.5	p		S	S	S	P	S
59H	Cold Springs to Ag. Fields	7/11	1.0	P		S	S	S	P	S
59I	Ag. Fields to Canal	7/11	1.7	P		S	S	S	P	S
59J	Canal to Oak Tree Canyon	7/11	.9	S		S	S	S	S	S
59K	Oak Tree Canyon to Spring Water Canyon	7/11	.3	P	1500ft <sup>2</sup>	S	S	S	P	S
59L	Spring Water Canyon to Gardner Canyon	7/11	1.0	S		S	S	S	S	S
59M	Gardner Canyon to Head Waters	7/11	1.3	P		S	S	S	P	S
62A	Empire Gulch Confluence	7/11	1.0	P		S	S	P	P	S
62D	Empire Gulch Spring-down stream	7/11	1.3	P		S	S	S	P	S

\* 59AA-59M

\*\* 62A;62D

1. S - Suitable; P - Potential; N - Not SWIFL Habitat 4. Canopy Density

2. Height

5. Understory Density

3. Width

6. Patch Size

Willow Flycatcher Survey Results (1994-2000) Cienega Creek

Stream Reach	Birds Detected? (Y/N)	Year Surveyed
Mattie Canyon to Cold Water Spring (59G)	No	1994
Ag. Fields to Canal (59I)	No (all years)	1994, 1998, 1999, 2000
Canal to Oak Tree Canyon (59J)	No	1994
Oak Tree Canyon to Spring Water Canyon (59K)	No	1994
Gardner to Head Waters (59M)	No	1994

## 9. SPECIAL STATUS SPECIES SUMMARIES

Note: Descriptions of federally listed and candidate species can be found in Chapter 3.

### Proposed Wildlife of Special Concern

**Mexican garter snake** (*Thamnophis eques*) - This species occupies perennial streams and permanent marshes at mid-elevations in central, south-central, and southeastern Arizona. It feeds primarily on fish and amphibians. Threats include predation by introduced exotics such as bullfrogs and habitat loss and degradation (AGFD 1996). There is suitable habitat along Cienega Creek. Mexican garter snakes occur along Cienega Creek and in tributaries in the planning area (BLM files). A priority vulnerable species in Sonoran Desert Conservation Plan (Pima County 2000).

**Bunch grass lizard** (*Sceloporus scalaris*) - This species is found in oak woodland, canyons, and montane forests of southeastern Arizona. Occasionally it is found in low-elevation grasslands. It frequents habitats with bunch grass. Threats include overgrazing of bunch grass habitat (AGFD 1996). This species is a likely inhabitant of grasslands above 4,000 feet within the planning area. It has been found at higher elevations in the Whetstone Mountains adjacent to the planning area (Turner and others 1999).

**Lowland leopard frog** (*Rana yavapaiensis*) - Occurs below 5500 feet elevation, south and west of Mogollon Rim in Arizona. This species occupies permanent waters, apparently preferring streams over ponds and other aquatic habitats. It has disappeared from most of lower Gila and lower Colorado river systems, and declines have also occurred in south central and southeastern Arizona. Threats include predation by non-native species such as bullfrogs, loss and degradation of habitats, and human uses of habitats (AGFD 1996). The planning area has suitable habitat along Cienega Creek and its tributaries. Lowland leopard frogs are present along Cienega Creek and at off-channel ponds in the floodplain (BLM files). A priority vulnerable species in Sonoran Desert Conservation Plan (Pima County 2000).

**Azure bluebird** (*Sialia sialis fulva*) - This is a Mexican sub-species of the Eastern bluebird. It occupies pine-oak forests of southeastern Arizona at elevations of 3280-6560 ft (Latta and others 1999). Azure bluebirds primarily utilize oaks including Emory, Arizona white, silverleaf and Mexican Blue oak tree species. They are frequently found in forest edges, areas with open canopy and scattered trees, as well as burned or cut woodland. They are a second cavity nester and utilize areas with high snag densities. Birds forage and nest in mature to late succession forest patches. Azure bluebirds are usually found in the mountains but have been documented at lower elevations in Patagonia, nesting in cottonwoods. In winter small flocks can wander and can sometimes be found in Tucson (Latta and others 1999). Threats include fuelwood harvesting and loss or degradation of higher elevation riparian habitats (AGFD 1996). During winter, there is the potential for flocks to travel onto the planning area from the Whetstone mountains.

**Western yellow-billed cuckoo** (*Coccyzus americanus occidentalis*) - This species is found in low elevation riparian areas with highest densities associated with cottonwood/willow communities with a canopy greater than 40 feet (Latta and others 1999). Potentially, they may utilize thick areas of mesquite bosque habitat. It feeds on beetles, grasshoppers, crickets, cicadas, and caterpillars. Threats include loss or degradation of native riparian habitat (AGFD 1996). Suitable habitat occurs along Cienega Creek in the planning area, and yellow-billed cuckoos are present. A priority vulnerable species in Sonoran Desert Conservation Plan (Pima County 2000).



**Ferruginous hawk** (*Buteo regalis*) - This species is found in high elevation grasslands and breeds in northern Arizona grasslands. Nests in juniper, rock outcrops or on open ground. In Arizona they can be found in open scrublands and woodlands, grasslands, semi-desert grasslands and agricultural areas in winter or during migration (Latta and others 1999). Threats include prairie dog control programs, human disturbance near nests, and urban expansion into grasslands (AGFD 1996). The Ferruginous hawk is an occasional visitor to the planning area where it forages in grassland habitats.

**Northern Goshawk** (*Accipiter gentilis atricapillus*) - In the southwest this species is found primarily in ponderosa pine and mixed conifer forests. Studies in Arizona showed that adults tend to winter in ponderosa pine and pinyon-juniper forests. Nests predominately in mature stands of coniferous forests in northern, north-central, and eastern Arizona. Threats include loss and/or modification of nesting habitat due to timber management and wildfires (AGFD 1996). There is potential for occasional vagrant visits to the planning area.

**Swainson's Hawk** (*Buteo swainsoni*) - This species thrives in open grassland or open agricultural areas with scattered tall trees or trees along riparian habitat for nesting and roosting (Latta and others 1999). In Arizona, breeds primarily in the southeastern and northwestern grasslands. In southeastern grasslands, nests have been found in mesquite, soaptree yucca, cottonwood, and western soaptree. IT feeds primarily on insects and small mammals. Migrates the farthest of all North American hawks, traveling as far south as Argentina. Threats include pesticide use in South America, loss of nesting sites due to brush clearing and possible loss of foraging habitat due to grassland conversion (AGFD 1996). The planning area provides suitable habitat for Swainson's hawk and nesting has been documented (BLM files). A priority vulnerable species in Sonoran Desert Conservation Plan (Pima County 2000).

**Green Kingfisher** (*Chloroceryle americana*) - A locally rare resident, nesting along San Pedro River and Sonoita Creek. Nesting documented from mid-May to mid-July. This species prefers small shady perennial streams that provide roosts over the water (Phillips and others 1964). Threats include degradation and loss of native riparian habitat (AGFD 1996). The planning area provides suitable habitat and this species is a rare to common visitor.

**Sprague's pipit** (*Anthus spragueii*) - This species winters mainly in desert grasslands of southeastern Arizona. It arrives on wintering grounds by mid-October and is usually gone by early April. It prefers grassland habitat with dense herbaceous vegetation and grassy agricultural fields. Threats include overgrazing (especially during drought years), shrub invasion, and urban development (AGFD 1996). The planning area provides suitable habitat and a wintering population is present.

**Baird's sparrow** (*Ammodramus bairdii*) - This species prefers non-grazed to lightly grazed short-grass and mid-grass habitat free of trees or shrubs for their wintering and breeding grounds. They prefer rolling hills for wintering ground. Light to moderate grazing is tolerated but heavy grazing can result in winter mortality due to loss of thermal cover. This species is most common in non-grazed areas and almost absent where grazing is more than moderate (Latta and others 1999). Threats include overgrazing grasslands (during drought years), shrub invasion and agricultural and urban development in southeastern Arizona (AGFD 1996). The planning area provides suitable habitat and wintering populations are present.

**Arizona grasshopper sparrow** (*Ammodramus savannarum ammoregus*) - The primary breeding range of this sub-species is restricted to southeastern Arizona and northern Sonora, Mexico. This species prefers un-grazed mid-height grasslands free of trees and shrubs (Latta and others 1999). Breeding is initiated with the onset of summer rains in July. Threats include urban, agricultural, and road development, overgrazing of grasslands (especially during drought years), and shrub invasion of grasslands (AGFD 1996). *A.s. ammodramus* is fairly common on lightly grazed pastures within the planning area.

**Western red bat** (*Lasiurus blossevillii*) - This species is found along waterways with broad-leaved deciduous riparian or woodland habitat present. In Arizona, primarily occurs along central and southeastern riparian corridors among walnut, sycamores, and cottonwoods at elevations from 2500 to 7000 feet. They roost singly or in small family groups (female and off-spring) among dense clumps of foliage with thick over-story and open under-story. Prey items include moths and flies, beetles, cicadas, crickets, and flying ants. Pups are born in late May to mid-June. Threats include loss of riparian and other broad-leaved deciduous forests and woodlands (AGFD 1996). They are thought to be a summer resident only. Suitable habitat occurs along Cienega Creek in the planning area and Western red bat are present (BLM files). A priority vulnerable species in Sonoran Desert Conservation Plan (Pima County 2000).

**Townsend's big-eared bat** (*Plecotus townsendii*) - This species is found in variety of habitats including deserts, woodland and pine forests. In Arizona it is widespread but not common. It is rare in northeastern grasslands and southwestern desert habitats of Arizona. It utilizes open mines and caves as day roosts and may roost at night in abandoned buildings. Foraging occurs in uplands and over water and prey is almost entirely moths (AZ Wildlife Views 1993). It winters in cold caves, lava tubes and mines mostly in upland and mountain locations. Threats include human disturbance at major maternity roosts; renewed mining, and closure or sealing of abandoned mines used as roosts (AGFD 1996). Suitable foraging habitat is present within the planning area and Townsend's big-eared bats have been documented within the planning area. No maternity roosts or hibernacula are known within the planning area. A priority vulnerable species in Sonoran Desert Conservation Plan (Pima County 2000).

**Black-tailed prairie dog** (*Cynomys ludovicianus*) - Extirpated from Arizona. This species is found in open desert grasslands and formerly occurred in plains grasslands of southeastern Arizona. It commonly feeds on short-grass species including buffalo grass (*Buchloe dactyloides*) and blue gramma (*Bouteloua gracilis*) (Van Pelt 1999). This species has been extirpated from the planning area, but the area provides potentially suitable habitat and this species is being considered for reintroduction.

## **BLM Sensitive Species**

**Longfin dace** (*Agosia chrysoaster*) - This species is found throughout the Gila River basin in Arizona and occupies a variety of habitats from clear, cool high-elevation brooks to small low-desert streams with a sand or gravel substrate (Minckley 1973). It is typically found below 5000 feet elevation. Longfin dace are omnivorous and opportunistic. The major threat to the species is loss of extensive areas of suitable habitat and specifically loss of small, sandy stream habitat (Pima County 2000). Longfin dace are present in Cienega Creek within the planning area (BLM files). A priority vulnerable species in Sonoran Desert Conservation Plan (Pima County 2000).

**Texas horned lizard** (*Phrynosoma cornutum*) - This species occurs from the Mississippi river region west to extreme southeast Arizona (Stebbins 1985). It inhabits arid and semi-arid open country with sparse plant growth. This species is found in semidesert grassland and plains grassland communities in southeastern Arizona. It eats chiefly ants but also takes beetles and grasshoppers. A Texas horned lizard was observed at the southeast corner of the Whetstone mountains (Turner and others 1999), and are also present in grassland northwest of the Whetstone mountains (Karen Simms, BLM biologist, personal communication).

**Gray hawk** (*Buteo nitidus*) - This species is found in wooded lowland streams in southeastern Arizona (Phillips and others 1964). Gray hawks arrive in nesting areas beginning in mid-March and depart for wintering areas in Mexico by mid-October. Nearly all gray hawk nesting areas in the United States are in Arizona, where about 55 pairs are known mainly from the San Pedro and Santa Cruz rivers. Gray hawks nest in cottonwood

willow galleries adjacent to mesquite woodlands. Threats include recreational disturbance and habitat destruction or modification (Glinski and others 1988). The planning area provides suitable habitat and grey hawk populations are increasing (BLM files).

**Western burrowing owl** (*Athene cunicularia hypugaea*) - The subspecies occurring in Arizona is one of up to 18 subspecies ranging from southern Canada through South America (Pima County 2000). Burrowing owls occupy flat unplowed prairies, grasslands, deserts, dikes and farms with existing burrows made by prairie dogs, banner tailed kangaroo rats and other mammals (Phillips and others 1964). Threats include loss of habitat from urban development, reductions in nest sites from decreases in burrowing mammal populations and effects of insecticides or rodenticides (Pima County 2000). Suitable habitat is present in the planning area. Historically communities were common in the planning area but have decreased to occasional occurrences. A priority vulnerable species in Sonoran Desert Conservation Plan (Pima County 2000).

**Loggerhead shrike** (*Lanius ludovicianus*) - This species is found in open country with scattered trees, shrubs, low scrub, and deserts with adequate perching material including lookout posts and wires. It nests in bushes and trees (Phillips and others 1964). Suitable habitat is present in the planning area and this species is a common winter resident.

**Southwestern cave myotis** (*Myotis velifer brevis*) - This species is found in Arizona within desertscrub communities of creosote, brittlebush, paloverde and various cacti between 300 and 5000 feet elevation. Summer congregations occur mostly in caves, tunnels, bridges, mines and sometimes in buildings near water. Arizona populations spend the winter hibernating in caves above 6,000 feet and others travel to the highlands of Mexico (Hoffmeister 1986, Barbour and Davis 1969). Threats include disturbance by humans at roosts and closure of abandoned mines (AGFD 1993). Suitable foraging habitat is present within the planning area and presence of the species has been documented (BLM files). No maternity roosts or hibernacula are known within the planning area.

**Fringed myotis** (*Myotis thysanodes*) - This species is found in a variety of habitats including low deserts, grasslands, oak woodland, ponderosa pine and spruce-fir forests throughout western North America (Barbour and Davis 1969). It prefers oak woodland habitat but forages out into surrounding habitats. Day and night roost sites include open mines, caves and buildings. During the summer this species is widespread in Arizona except in the southwestern region. It winters in the northwest and southeast corners of Arizona (Hoffmeister 1986). Suitable foraging habitat is present in the planning area and presence of the species has been documented (BLM files). No maternity roosts or hibernacula are known within the planning area.

**California leaf-nosed bat** (*Macrotus californicus*) - This species is predominately found in southwestern Arizona in Sonoran and Mohave desertscrub, but is occasionally found in the Chihuahuan and Great Basin deserts (Hoffmeister 1986). Day roosts include mines and caves and night roosts include mines, bridges, open buildings, cellars and porches. California leaf-nosed bats remain active in the same area year round and unlike many bats do not hibernate or migrate. They primarily eat insects including grasshoppers, cicadas, beetles, butterflies, and caterpillars (Barbour and Davis 1969). Threats include human disturbance at roosts and closure of abandoned mines or buildings being used as roosts (AGFD 1993). Suitable foraging habitat is present in the planning area and presence of the species has been documented (BLM files). A priority vulnerable species in Sonoran Desert Conservation Plan (Pima County 2000).

**Mexican long-tongued bat** (*Choeronycteris mexicana*) - This species occurs in the United States only in southeastern Arizona and extreme southwestern New Mexico during the summer and early fall (Barbour and Davis 1969). In Arizona, it has been found from the Chiricahua mountains to the Santa Catalina mountains to the Baboquivari mountains. In Arizona, it is found generally in oak-pine habitats at 4,000-6,000 feet although it

has been documented in saguaro-paloverde desert scrub (Hoffmeister 1986). Typical roost sites are open mines and caves and usually less than a dozen individuals are present in a roost. Agave nectar is a common component of its diet. Within the roosts, Mexican long tongued bats are usually found in the dimly lighted zone near the entrance to a roost. Threats include human disturbance of roosts and habitat loss such as over harvest of agaves in Mexico (AGFD 1993). Suitable foraging habitat and roost sites are present within the planning area, and the species has been documented to occur within the planning area (BLM files). A priority vulnerable species in Sonoran Desert Conservation Plan (Pima County 2000).

## 10. SPLIT-ESTATE LANDS\*

### Empire-Cienega Planning Area Split-estate lands

T18S, R17E		
Sec. 5, lot 7, lot 13		76.83
Sec. 3, lots 1 - 8 incl., S½SE¼		303.85 <i>State</i>
Sec. 1, S½NW¼, lots 5 -9 incl.		176.33 <i>State</i>
Sec. 9		@250
Sec. 8, lots 1,2,3,5,6,7		222.17
Sec. 18, lots 3,4, SESW, SESESE, N½N½SE		@190
Sec. 17, lots 4,5,8, SE¼, S½SW¼, NESW, N½NWSW		369.45
Sec. 19, lots 1,2, E½NW¼, SESW, N½SE¼, SESE		317.99
T18S, R16E		
Sec. 24, lots 1 - 4 incl., NW¼, W½NE¼		348.00
T18 S, R18E		
Sec. 5, E½		320.00
T19S, R18E		
Sec. 23, N½NE¼, SENE		120.00
Sec. 15, SWSW		40.00
Sec. 22, E½W½		160.00
Sec. 25 E½		320.00
T20S, R17E		
Sec. 13, SE¼, E½SW¼		240.00
Sec. 24, NENE, NENW		80.00
T20S, R18E		
Sec. 10, S½SW¼		80.00
Sec. 12, SE¼		160.00
Sec. 13, NE¼		160.00
Sec. 14, NE¼, N½NW¼, SENW, N½SE¼, SESE, S½SW¼		480.00 <i>State</i>
Sec. 15, N½NE¼		80.00 <i>State</i>
Sec. 23, NE¼		160.00 <i>State</i>
Sec. 24, NW¼, N½SW¼		240.00 <i>State</i>
T20S, R19E		
Sec. 15, N½, N½S½		480.00
Sec. 20, NE¼, E½SW¼, W½SE¼		320.00
Sec. 21, NW¼		160.00
Sec. 29, E½NW¼, W½NE¼		160.00
T21S, R18E		
Sec. 14, lot 4		34.89
Sec. 15, NESE		40.00
Sec. 23, S½		320.00
T21S, R19E		
Sec. 11, lots 1 - 3 incl., W½NE¼, E½NE¼, NWSE, NESW, SENE, NESE		425.20
Sec. 19, lots 2,3,4,6, and 7, SW, SENW, S½SWNW, NWSWNW, SWNWNW, SENENW, SENWNENW, E½SWNENW, S½NENENW		432.33
		<b>Total 7167.04</b>

\*State means State Trust Land surface, all others are private surface.

Sec. 14, lot 4	34.89
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## 11. LIST OF SCIENTIFIC PLANT AND ANIMAL NAMES USED IN THIS DOCUMENT

Common Name	Scientific Name
<b>PLANTS</b>	
<b>Trees</b>	
Apache pine	<i>Pinus engelmannii</i>
Arizona black walnut	<i>Juglans major</i>
Arizona white oak	<i>Quercus arizonica</i>
Arizona rosewood	<i>Vauquelinia californica</i>
Chihuahuan pine	<i>Pinus leiophylla</i>
Douglas fir	<i>Pseudotsuga menziesii</i>
Emory oak	<i>Quercus emoryi</i>
Fremont's cottonwood	<i>Populus fremontii</i>
Goodding willow	<i>Salix gooddingii</i>
netleaf hackberry	<i>Celtis Reticulata</i>
mesquite	<i>Prosopis glandulosa</i>
Mexican blue oak	<i>Quercus oblongifolia</i>
Mexican pinyon	<i>Pinus cembroides</i>
silverleaf oak	<i>Quercus hypoleucoides</i>
velvet ash	<i>Fraxinus pennsylvanica</i>
<b>Shrubs and Cactus</b>	
beargrass	<i>Nolina</i> spp.
burroweed	<i>Isocoma tenuisecta</i>
century plant (agave)	<i>Agave</i> spp.
cholla	<i>Cholla</i> spp.
false mesquite	<i>Calliandra eriophylla</i>
fourwing saltbush	<i>Atriplex canescens</i>
manzanita	<i>Arctostaphylos</i> spp.
mountain mahogany	<i>Cercocarpus montanus</i> var. <i>glaber</i>
needle spined pineapple cactus	<i>Echinomastus [= Neolloydia] erectocentrus</i> var. <i>erectocentrus</i>
ocotillo	<i>Fouquieria splendens</i>
Palmer agave	<i>Agave palmeri</i>
prickly pear	<i>Opuntia</i> spp.
range ratany	<i>Krameria parvifolia</i>
seepwillow	<i>Baccharis salicifolia</i>
shrubby buckwheat	<i>Eriogonum wrightii</i>
silkassel	<i>Garrya wrightii</i> Torr.
skunkbush	<i>Rhus trilobata</i>
snakeweed	<i>Gutierrezia sarothrae</i>
soaptree yucca	<i>Yucca elata</i>
turbinella oak	<i>Quercus turbinella</i>
yucca	<i>Yucca</i> spp.
whitethorn	<i>Acacia constricta</i>
<b>Grasses and Grasslike Plants</b>	

<b>Common Name</b>	<b>Scientific Name</b>
Arizona cottontop	<i>Trichachne californica</i>
alkali sacaton	<i>Sporobolus airoides</i>
big sacaton	<i>Sporobolus wrightii</i>
black grama	<i>Bouteloua eriopoda</i>
blue grama	<i>Bouteloua gracilis</i>
bullgrass	<i>Muhlenbergia emersleyi</i>
bulrushes	<i>Scirpus spp.</i>
bush muhly	<i>Muhlenbergia porteri</i>
<del>cane beardgrass</del>	<del><i>Andropogon barbinodis</i></del>
cane bluestem, <b>cane beardgrass</b>	<i>Bothriochloa barbinodis</i>
cattail	<i>Typha latifolia, Typha domingensis</i>
spiked crinkleawn	<i>Trachypogon spicatus</i>
deergrass	<i>Muhlenbergia rigens</i>
green sprangletop	<i>Leptochloa dubia</i>
hairy grama	<i>Bouteloua hirsuta</i>
lehmann lovegrass	<i>Eragrostis lehmanniana</i>
plains bristlegrass	<i>Setaria grisebachii</i>
plains lovegrass	<i>Eragrostis intermedia</i>
prairie junegrass	<i>Koeleria macrantha</i>
rushes	<i>Juncus spp.</i>
sedges	<i>Carex/Cyperus spp.</i>
sideoats gramma	<i>Bouteloua curtipendula</i>
slender grama	<i>Bouteloua filiformis</i>
spike rushes	<i>Eleocharis spp.</i>
sprucetop grama	<i>Bouteloua chondrosioides</i>
squirreltail	<i>Sitanion hystrix</i>
Texas little bluestem	<i>Schizachyrium cirratum</i>
Texas timothy	<i>Phleum pratense</i>
three-awns	<i>Aristida spp.</i>
tobosa	<i>Hilaria mutica</i>
vine mesquite grass	<i>Panicum obtusum</i>
wolftail	<i>Lycurus phleoides</i>
woolyspike balsamscale	<i>Elionurus barbiculmis</i>
<b>Forbs</b>	
Canelo lady tresses orchid	<i>Spiranthes delitescens</i>
horned pond-weed	<i>Zannachellia palustris</i>
Huachuca golden aster	<i>Heterotheca rutteri</i>
Huachuca water umbel	<i>Lilaeopsis schaffneriana ssp. recurva</i>
penny-wort	<i>Hydrocotyle verticillata</i>
speedwell	<i>Veronica</i>
stonewort	<i>Chara spp.</i>
water parsnip	<i>Berula erecta</i>
yerba mansa	<i>Anemopsis californica</i>
<b>ANIMALS</b>	
<b>Fish</b>	

<b>Common Name</b>	<b>Scientific Name</b>
Gila Chub	<i>Gila intermedia</i>
Gila topminnow	<i>Poeciliopsis occidentalis</i>
Longfin dace	<i>Agosia chrysogaster</i>
<b>Amphibians and Reptiles</b>	
Bunch grass lizard	<i>Sceloporus scalaris</i>
Chiricahua leopard frog	<i>Rana chiricahuensis</i>
Great plains narrow-mouthed toad	<i>Gastrophyrne olivacea</i>
Green rat snake	<i>Elaphe subocularis</i>
Lowland leopard frog	<i>Rana yavapaiensis</i>
Mexican garter snake	<i>Thamnophis eques</i>
Sonoran Mud Turtle	<i>Kinostemon sonoriense</i>
<b>Birds</b>	
American redstart	<i>Setophaga ruticilla</i>
Arizona grasshopper sparrow	<i>Ammodramus savannarum ammolegus</i>
Azure bluebird	<i>Sialia sialis fulva</i>
Baird's sparrow	<i>Ammodramus bairdii</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Black-capped gnatcatcher	<i>Polioptila nigriceps</i>
Black-shouldered kite	<i>Elanus caeruleus</i>
Buff-breasted flycatcher	<i>Empidonax fulvifrons</i>
Ferruginous hawk	<i>Buteo regalis</i>
Great blue heron	<i>Ardea herodias</i>
Green kingfisher	<i>Chloroceryle americana</i>
Northern aplomado falcon	<i>Falco femoralis septentrionalis</i>
Northern goshawk	<i>Accipter gentilis</i>
Northern gray hawk	<i>Buteo nitidus maximus</i>
Osprey	<i>Pandion haliaetus</i>
Rose-throated becard	<i>Pachyramphus aglaiae</i>
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>
Sprague's pipit	<i>Anthus spragueii</i>
Swainson's hawk	<i>Buteo swainsoni</i>
Thick-billed kingbird	<i>Tyrannus crassirostris</i>
Tropical kingbird	<i>Tyrannus melancholicus</i>
Virginia rail	<i>Rallus limicola</i>
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>
<b>Mammals</b>	
Antelope jack rabbit	<i>Lepus alleni</i>
Black-tailed jack rabbit	<i>Lepus californicus eremicus</i>
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>
Bobcat	<i>Felis rufus</i>
California leaf-nosed bat	<i>Macrotus californicus</i>
Chihuahuan pronghorn	<i>Antilocapra americana mexicana</i>
Coati	<i>Nasua nasua</i>
Cottontail rabbit	<i>Sylvilagus auduboni arizonae</i>



<b>Common Name</b>	<b>Scientific Name</b>
Coyote	<i>Canis latrans</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Greater western mastiff bat	<i>Eumops perotis californicus</i>
Grizzly bear	<i>Ursus arctos</i>
Jaguar	<i>Felis onca</i>
Lesser long-nosed bat	<i>Leptonycteris curasoae yerbabuena</i>
Mexican long-tongued bat	<i>Choeronycteris mexicana</i>
Mexican wolf	<i>Canis lupus baileyi</i>
Mountain lion	<i>Felis concolor</i>
Mule deer	<i>Odocoileus hemionus</i>
Porcupine	<i>Erethizon dorsatum</i>
Raccoon	<i>Procyon lotor</i>
Ringtail	<i>Bassariscus astutus</i>
Southwestern cave myotis	<i>Myotis velifer brevis</i>
Townsend's big-eared bat	<i>Plecotus townsendii</i>
Western red bat	<i>Lasiurus blossevillii</i>
White-tailed deer	<i>Odocoileus virginianus</i>

# APPENDIX 4

## Cumulative Impact Assumptions

### Management of Intermixed Lands

#### State Trust Lands

It is assumed that, in the short-term, the Arizona State Land Department will continue to manage State Trust lands in the watershed for short term/highest economic benefit including issuing leases/permits for mining, grazing, recreation, rights-of-ways and commercial purposes.

In the long term, it is assumed that the State Land Department would consider selling State Trust land in the watershed for development purposes (real estate/commercial).

At the time of preparation of this EIS, several initiatives were being proposed to amend the Arizona State Constitution to shift the emphasis on some State Trust lands to conservation use. Should such an initiative pass in the future, then some or all of the intermixed State Trust Lands in the planning area might be considered for this category in the long-term. Depending on the wording of the initiative, uses such as grazing and recreation might continue on these selected lands, but sale of land or issuance of commercial leases would be unlikely to occur.

BLM could purchase State Trust lands or conservation easements in the planning area if resources became available but could not acquire lands through exchange unless authorized by legislation amending the State Constitution.

#### Forest Service Lands

It is assumed that in the short and long term that the Forest Service will continue to manage land for multiple uses/sustained yield including grazing, mining, recreation, wildlife, etc. and that in the short-term, the Forest Service will continue to make minor land use adjustments to block up forest lands and reduce inholdings (Including additional lands going to private along the eastern Forest Boundary in the Santa Rita Mountains).

Over the long-term, the Forest Service may change some current management strategies to meet the goals/objectives developed by the Sonoita Valley Planning Partnership through Forest Plan Revision or Amendment.

#### Private Lands

It is assumed that in the short-term, surrounding private lands will be a mix of large ranches and smaller “ranchettes” (<40 acres).

In the long-term, economic/social pressures to sell off ranches for development would likely increase and higher density development would occur.

Growth management strategies developed by the Sonoita Crossroads Community Forum and other local-driven growth management and planning efforts may result in opportunities for preservation of open space and conservation of natural resources through strategies such as purchase of conservation easements and purchase of development rights.

BLM could acquire private lands or conservation easements in the planning area from willing sellers through donation, exchange, or purchase if resources became available.

# APPENDIX 5

## LAS CIENEGAS RMP MAILING LIST

Las Cienegas RMP Mailing List

First Name	Last Name	Title	Organization
<b>Elected Official - Federal</b>			
J.D.	Hayworth	Congressman	
Jim	Kolbe	Congressman	
Jon	Kyl	Senator	
John	McCain	Senator	
Bob	Stump	Representative	
<b>Elected Official - Local</b>			
<i>City of Tucson</i>			
Jerry	Anderson	Ward Three, Council Member	
Jose	Ibarra	Ward One, Council Member	
Steve	Leal	Ward Five, Council Member	
Fred	Ronstadt	Ward Six, Council Member	
Shirley	Scott	Ward Four, Council Member	
Robert	Walkup	Mayor	
Carol	West	Ward Two, Council Member	
<i>Pima County - Board of Supervisors</i>			
Sharon	Bronson	District 3, Vice Chair	
Ray	Carroll	District 4	
Ann	Day	District 1	
Dan	Eckstrom	District 2	
Raul	Grijalva	District 5, Chairman	
<i>Santa Cruz County - Board of Supervisors</i>			
Robert	Damon	District 2	
Ronald R.	Morris	District 3	
Roberto	Rojas	District 1	
<i>Cochise County - Board of Supervisors</i>			
Lois	Backe	Budget Officer	
Victoria	Christiansen	Secretary Senior	
Jody N.	Klein	County Administrator	
Maria G.	Marsh	Assistant to the Clerk	
Nadine M.	Parkhurst	Clerk of the Board	Cochise County

Las Cienegas RMP Mailing List, continued

First Name	Last Name	Title	Organization
<b>Elected Official - State</b>			
Don	Aldridge	Representative	
Debra	Brimhall	Representative	
Jack	Brown	Senator	
Jim	Carruthers	Representative	
Harry	Clark	Representative	
Pat	Conner	Senator	
Franklin	Flake	Representative	
Joe	Hart	Representative	
Jane	Hull	Governor	
Sue	Lynch	Representative	
Bob	McLendon	Representative	
Rebecca	Rios	Representative	
Peter	Rios	Senator	
Carol	Springer	Senator	
John	Verkamp	Representative	
John	Wettaw	Senator	
<b>Government - Federal</b>			
			Air Force Pentagon
			Directorate of Env. Qlty.
			Federal Highway Administration
			Kaibab Nat'l Forest
			Lake Mead Nat'l Recreation Area
			Mineral Mang. Service
			Natural Resource Conservation Service, USDA
			Nat'l Park Service
			U.S. Air Force 56 CES/CEVN
			U.S. Bureau of Indian Affairs (BIA)
			U.S. Bureau of Land Mgmt. (BLM)
			U.S. Bureau of Reclamation (BOR)
			U.S. Dept. of Agriculture (USDA)
			U.S. Dept. of Army, Corps of Eng
			U.S. Dept. of Army, Ft. Huachuca Wildlife
			U.S. Dept. of Energy
			U.S. Env. Protection Agency (EPA)
			U.S. Fish & Wildlife Service (USFWS)
			U.S. Forest Service (USFS)
			Coronado Nat'l Forest
			Prescott Nat'l Forest
			Tonto Nat'l Forest
			Mesa R.D. Tonto Nat'l Forest

Las Cienegas RMP Mailing List, continued

First Name	Last Name	Title	Organization
			U.S. Geological Survey (USGS)
			U.S. National Park Service
		<b>Government - Local</b>	
			Central AZ Assoc. of Gov.
			City of Sierra Vista
			City of Tucson
			Eastern AZ Counties Org.
			Park Recreation & Library Dept. of Tucson
			Pima Co. Dept. of Civil Works
			Pima Co. Dept. of Transpnt.
			Pima Co. Devlp. Brd. & Visitor Ctr.
			Pima Co. District Library
			Pima Co. Economic Dev.
			Pima Co. Land Use Committee
			Pima Co. Recreation Service
			Pima Co. Parks & Recreation
			Pima Co. Sheriff's Mounted Posse
			Pima Co. Wastewater Mang.
			Santa Curz Co., Planning Dept.
			Southeastern AZ Gov. Org.
			SW Land Exchange Project
			Tucson Chamber of Com.
			Tucson Fire Dept.
			Tucson Library
			Tucson Police Dept.
		<b>Government - State</b>	
			ASU AZ Mineral Assn.
			ASU, Center for Env. Studies
			ASU Chapter of the Wildlife
			ASU-Dept. of Anthropology
			ASU-Dept. of Plant Biology
			ASU, Dept. of Zoology
			ASU, Office of Cultural Resource
			AZ Arch Council & State Museum
			AZ Commission of Indian Affairs
			AZ Dept. of Env. Quality (ADEQ)
			AZ Dept. of Water Resources (ADWR)
			AZ Game & Fish Dept. WM-HB
			AZ Geological Survey
			AZ State Clearinghouse
			AZ State Land Dept. (ASLD)

First Name	Last Name	Title	Organization
			State Land Commissioner
			AZ State Mine Inspector's Office
			AZ State Parks
			OHV Coordinator
			AZ Trail Coordinator
			AZ State Parks Board
			Central AZ Project
			GR & Canyon University
			Natural Resources
			NAU, Cline Library
			NAY, School of Forestry
			Northwestern University
			Office of Attorney General
			Olympic State Park
			Soil & Water Conservation
			U of A Administration 412
			U of A, College of Law
			U of A School o Renewable Nat. R
			UC Davis
			University of AZ (U of A)
		<b>Government - Tribal</b>	
			Ak-Chin Indian Community Env.
			Broadway/Gap Charter-Western
			Ft. McDowell Mohave-Apache Indian Comm.
			Kaibab-Paiute Council
			Office of Hopi Lands, the Hopi Tribe
			Pascua Yaqui Tribe
			Salt River Pima-MCPA Indian Comm.
			San Carlos Apache Tribe
			Tohono O'odham Nation
			Yavapai-Apache Community
		<b>Media</b>	
			ANRN
			Associated Press
			AZ Daily Star
			AZ Daily Sun
			Arizonian Weekly Bulletin
			Bumpy Road News
			Copper Basin News
			Daily Dispatch
			Freelance Writer
			Green Valley News & Sun
			Lake Powell Chronicle

Las Cienegas RMP Mailing List, continued

First Name	Last Name	Title	Organization
			Mesa Tribune
			Nogales International
			Phoenix Gazette
			Tucson Citizen
		<b>Non-Government Organization</b>	
			American Fisheries Society
			Amigos
			Audubon Society
			AZ Antelope Foundation
			AZ-Archaeological Society
			AZ Assoc. of 4-Wheel Drive Club
			AZ Cattle Growers Assn.
		<b>Non-Government Organization</b>	
			AZ Rough Riders
			AZ State Assn. Of 4-Wheel Drive
			AZ State Rifle
			AZ Trail Assoc.
			AZ Wilderness Coalition
			AZ Wildlife Federation
			AZ Wool Producers Assn.
			Bullhead 4 Wheelers
			Center for Biological Diversity
			Cochise Co. Rough Riders
			Colorado River
			Co. Line Riders
			Co. SPRVSRE Assn.
			Copper State 4-Wheel Drive Club
			Council for Sustainable Living
			Creepy Crawlers 4 Wheeler Drive
			Defenders of Wildlife
			SW Rep., Defenders of Wildlife
			Desert Fishes Council
			Friends of Animals
			Friends of AZ Rivers
			Friends of Pronatura
			Forest Guardians
			Fund for Animals
			Garrett 4 WDC/AWA4WDC
			Glendale Hiking Club
			Greater AZ Bicycling Assn.
			Greater Phoenix Brittany Club
			Hassayampa River Preserve
			Huachuca Hiking Club

Las Cienegas RMP Mailing List, continued

First Name	Last Name	Title	Organization
			Havasu 4-Wheelers
			Hualapai 4-Wheelers
			Imprinting Foundation
			Internat'l Sonoran Desert Alliance
			Int'l Soc. of Protection of Mustangs
			Lands Foundation
			Lions Internat'l. (AZ)
			Mesa 4-Wheelers
			Minerals Exploration Coalition
			Mohave Prospectors Assn.
			Mohave Co. Trails Assn., Inc.
			Motorola Dust Devils 4-Wheelers
			NOHUCC/AUHUA
			North American Bear Society
			Oracle Trails Coalition
			Roadrunner 4-Wheelers
			Pebble Pickin Posse
			People for the West
			Pima NRCD
			Pima Trails Association
			Rio Salado Vizla Club
			Research Ranch
			Rincon Institute
			Sahuaro 4X4's Sahuaro Brittany Club
			Santa Cruz Cnty. Fair & Rodeo Assn.
			Sierra Club-Rincon Group
			Sky Island Alliance
			Superstition Area Land Trust
			Southern Arizona Guides & Outfitters
			So. AZ Wildlife Callers
			Sonoita Bird Dog Club
			Sonoran Institute
			Southern Arizona Hiking Club
			Southern AZ G-S Pointer Club
			State Land Interface & United Dir.
			The Nature Conservancy
			Arizona Chapter
			Ramsey Cyn Preserve
			Tucson Amateur Astronomy
			Tucson Audubon Society
			Tucson Orienteering Club
			Tucson Rod & Gun Club
			Tucson Saddle Club



Las Cienegas RMP Mailing List, continued

First Name	Last Name	Title	Organization
			Verde Valley 4-Wheel Drive Club
			Walapai 4-Wheelers
			Whittell Wildlife Trust
			Wilderness Land Trust
			Wildlife Society-AZ Chapter
			Yarnell Senior Citizens Center
		<b>Private</b>	
			Asarco, Inc.
			Asarco-SW Mining Division
			Boyce Thompson Arboretum
			Chambers Group
			Crown C Ranch
			El Paso Natural Gas Co.
			Empire Ranch Prop Owners
			Empire Rita Ranch
			Empire Valley
			Fossil Energy
			Helvetia Ranch
			High Haven Ranch
			McGann & Associates, Inc.
			M & K Associates
			Oakdale Ranch
			Rosemont Asarco, Inc.
			R/W Agent, AEPCO
			Phoenix Zoo
			Santa Fe Ranch
			Santa Rita Abbey
			Singing Valley Ranch
			S-Lazy J
			SW Minerals Explor Assoc.
			West Diamond M Ranch
			Windmill Ranch
			Whitney Ranch
			Zeneca Specialties
		<b>Private - Citizen</b>	
Rena Ann	Abolt		
Rev. Mother Beverly	Aitken		
Norman	Ahl		
Carol	Anderson		
Marge	Anderson		
Molly	Anderson		
Alma	Baker		
Berly	Baker		

Las Cienegas RMP Mailing List, continued

First Name	Last Name	Title	Organization
		<b>Private - Citizen</b>	
Ken	Baker		
Michael	Baker		
Cecile & Sarah	Barches		
David	Barnes		
Becty	Barrios		
Mary	Bartol		
Stu	Bengson		
Kitty	Bennett		
Dave	Bertelsen		
John & Kay	Berian		
Peter	Bidegon		
Milo	Blecha		
Steve	Bioce		
Clare	Bonnelli		
Bob & Mary	Borman		
John	Bourdeau		
Bill	Branan		
Jerry & Dikie	Brever		
Mette	Brogden		
Gary	Brown		
Gale W.	Bundrick		
Happ	Burnett		
Margie	Buyer		
Sherri	Buzzard		
Ann	Carr		
Vincent & Dee	Cattolica		
Wess	Chambers		
Bob	Chap		
Ben & Patty	Claridge		
Shel	Clark		

Las Cienegas RMP Mailing List, continued

First Name	Last Name	Title	Organization
		<b>Private - Citizen</b>	
Mark	Cleveland		
Meade	Clyne		
Walter & Nancy	Coble		
Diane	Collins		
Glen	Collins		
Jim & Midge	Cole		
Jerry	Coolidge		
Pete	Cowgill		
Leslie J.	Cox		
Genee	Davidson		
Bob	Deming		
James W.	Dettmer		
Bob	Dixon		
Lucille	Dixon		
Sandy	Deitering		
John & Barbara	Donaldson		
Mac & Billie	Donaldson		
Mark	Douglas		
Foster	Drummond		
James	Dunn		
Don	Dybus		
Arlene	Essig		
Mark	Exline		
Morris	Farr		
Julia	Fonseca		
Sidney H.	Franklin		
Brian	Friedman		
Chuck	Frost		
Velma	Furno		
Pat	Gallagher		
Peter	Galvin		
Bill & Sandi	Garbutt		
Dale	Gazzolo		
Stephanie	Gibert		
Kevin	Giddens		
Al	Glynn		
Keith	Graves		
Debbie	Greenside		
Rachel	Grunefelder		
Ken & Ethel	Haber		
Brad	Haber		
Douglas	Hamilton		

Las Cienegas RMP Mailing List, continued

First Name	Last Name	Title	Organization
		Private - Citizen	
Traci	Hamilton		
Jan	Hancock		
Diane & Neal	Hanna		
Beth	Hardy		
David	Harker		
Richard	Harris		
Williams	Haynes		
Cisney	Havatone		
Ralph	Higgs		
Leonard	Hines		
David	Hogan		
Don	Hogg		
David	Hoffman		
J. F. & P. D.	Hoffman		
John	Hoffman		
Mac	Hudson		
Gail	Hummel		
Hedi	Hummel		
Ron	Hummel		
Don	Irving		
David	Jacome		
Rukin	Jelks		
Peggy	Johnson		
Drexal	Jones		
Bob	Kamilli		
Walter & Evelyn	Karl		
Tim & Jonelle	Kearney		
Gary	Keller		
Gene & Jerry	Kindred		
Lou Anne	Kirby		
Jake	Kittle		
Doug	Koppinger		
<b>Gerald</b>	<b>Korte</b>		
Alexis	Kostich		
Don	Kucera		
Ray	Kunde		
Jim	Lamb		
Tom	Lajoie		
Charles	LeFevre		
Lainie	Levick		
Cynthia	Lovely		
John & Cynthia	Lunine		

Las Cienegas RMP Mailing List, continued

<b>First Name</b>	<b>Last Name</b>	<b>Title</b>	<b>Organization</b>
<b>Private - Citizen</b>			
Wes & Marilyn	Manshall		
Bob & Darlene	Mansmith		
Ken	Marcus		
George	Masek Jr.		
Vicki	Mattox		
John	Maynard		
Joanne	Meyer		
Pam	Mickolowski		
Mark	Miller		
Michael & Dawn	Milroy		
Larry	Missal		
William	Mories		
Ann	Moote		
Austin	Moss		
Grandy	Montgomery		
Bob	McClain		
Michael	McGah		
Donald	McGann		
Ann	McGreevy		
Barbara	McReynolds		
Carlos	Nagel		
Evalyn	Newhaus		
Lee	Nellis		
James	Notestine		
Russ	O'Brien		
Phil, Patrick & Brenda	Ogden		
Becky	Peterman		
Pete	Pfeifer		
Lon	Pierce		
Rosalee K.	Ponce		
Hec	Ramsey		
Josh	Randall		
Aubrey & Luann	Raus		
Martin	Reff		
Leonard	Riechart		
Tom	Reininger		
Jim & Michey	Renfro		
Raymond	Rich		
Tom	Richter		
Robert	Rivers		
Bob & Joy	Rhinesmith		
Dot	Rhodes		

Las Cienegas RMP Mailing List, continued

First Name	Last Name	Title	Organization
		Private - Citizen	
<b>Dan</b>	<b>Robinett</b>		
Bill	Rowekamo		
David	Ruben		
Steve	Saway		
Doug	Sawyer		
Mike	Schenk		
Jeff	Schmidt		
Justin	Schmidt		
Terry	Schwartz		
Cabot	Sedgwick		
Mike	Siedman		
Randy	Simmons		
Doug	Shough		
J. W.	Smith		
Lamar	Smith		
Michael	Smith		
Larry	Snead		
Doug	Snow		
L B	Solsberry		
Jay	Spehar		
Larry	Stallcup		
Doug	Sposito		
John	Startt		
John	Stephanson		
Lewis	Stickford		
Karen & Steve	Strom		
Julie	Stromberg		
Rex & Katie	Stump		
John	Sullivan		
Van	Talley		
Kiyo	Taylor		
Rheal	Tetreault		
T. E.	Tiernay		
Kelly	Tighe		
Ron	Tiller		
Rachel	Thomas		
George	Trigaux		
Sharon	Urban		
Lowell	Van Dyke		
Dusty	Vail Ingram		
Sue Ann	Vannoz		
Mindy	Vaughan		

Las Cienegas RMP Mailing List, continued

<b>First Name</b>	<b>Last Name</b>	<b>Title</b>	<b>Organization</b>
		<b>Private - Citizen</b>	
Robert	Veregara		
Donna	Vettleson		
George	Volker		
Mike & Barbara	Wagoner		
David & S. M.	Walker		
Berb	Waters		
Frances	Werner		
Don	Wienstien		
William	Well II		
Betty J.	Wells		
Frank	Wilczek		
Jeff	Williamson		
Paul & Cheryl	Wilson		
Dennis & Mary	Whicker		
Volney	White		
Peter	Whitney		
Ann Marie	Wolf		
Stephen	Wood		
Beth	Wooden		
Barbara	Zook		

# GLOSSARY

**ABIOTIC:** The nonliving, material (as opposed to conceptual) components of the environment, such as air, rocks, soil, water, coal, peat, and plant litter. Also see BIOTIC.

**ACCELERATED SOIL EROSION:** Soil loss above natural levels resulting directly from human activities. Because of the slow rate of soil formation, accelerated erosion can permanently reduce plant productivity.

**ACQUIRED PUBLIC LANDS:** Lands in federal ownership that the government obtained as a gift or by purchase, exchange, or condemnation. Also see PUBLIC LANDS.

**ACRE-FOOT:** A volume that covers an area of 1 acre to a depth of 1 foot (43,560 ft<sup>3</sup>).

**ACTIVE MANAGEMENT AREAS:** Five areas in Arizona (i.e., Prescott, Phoenix, Pinal, Santa Cruz, and Tucson) where the Arizona Department of Water Resources regulates groundwater use. Groundwater regulations stem from the 1980 Arizona Groundwater Management Code which provides the management framework to ensure dependable water supplies for Arizona well into the future. Ensuring dependable supplies, the code places conservation requirements on municipal and agricultural water use and promotes the use of renewable supplies, such as Colorado River water delivered by the Central Arizona Project. Also see TUCSON ACTIVE MANAGEMENT AREA.

**ACTIVITY PLAN:** A detailed and specific plan for managing a single resource program or plan element undertaken, as needed, to implement the more general resource management plan (RMP) decisions. BLM prepares activity plans for specific areas to reach specific resource management objectives within stated time frames.

**ADAPTIVE REUSE:** Repairing or remodeling a historic structure so that it can be used for purposes other than those for which it was originally built.

**ADMINISTRATIVE USE OF MINERAL MATERIALS:** BLM's use of mineral materials from public land for land management projects.

**ADVANCED ECOLOGICAL STATUS:** A condition that is considered to be achieved when the existing vegetation community on a defined ecological site has a high correlation to the potential natural community for that site (i.e., ecological site rating > 50). These conditions are determined from ecological site inventories using the Natural Resource Conservation Service (NRCS) ecological site guides to compare the existing vegetation communities on each ecological site to the potential plant community for that site. Achieving an advanced ecological status is assumed to be an expression of the physical and biological condition or degree of function needed to sustain a healthy rangeland ecosystem.

**AGGREGATE:** Uncrushed or crushed gravel, crushed stone or rock, sand, or artificially produced inorganic matter that forms the major part of concrete.

**AIR QUALITY RATING:** See CLASS I AIR QUALITY RATING and CLASS II AIR QUALITY RATING.

**AIRSHED:** The atmospheric zone potentially influenced by air pollutants from various sources.

**ALLOTMENT:** An area of one or more pastures where one or more operators graze their livestock. An allotment generally consists of federal rangelands, but may include



## *Glossary*

intermingled parcels of private, state, or federal lands. BLM stipulates the number of livestock and season of use for each allotment.

**ALLOTMENT MANAGEMENT PLAN (AMP):** A livestock grazing management plan dealing with a specific unit of rangeland and based on multiple use resource management objectives. The AMP considers livestock grazing in relation to other uses of rangelands and to renewable resourced--watershed, vegetation, and wildlife. An AMP establishes the seasons of use, number of livestock to be permitted on rangelands, and the range improvements needed.

**ALLUVIAL FAN:** A low, outspread, relatively flat to gently sloping mass of sediment, shaped like an open fan and deposited by a stream where it flows from a narrow mountain valley onto a plain or broad valley.

**ALLUVIUM:** Any sediment deposited by flowing water as in a riverbed, floodplain, or delta.

**AMALGAMATION PAN:** A circular, cast-iron pan in which gold or silver ore is ground and the precious metal particles are amalgamated when mercury is added.

**ANIMAL UNIT:** One mature (1,000 pound) cow or the equivalent based upon an average daily forage consumption of 26 pounds of dry matter per day.

**ANIMAL UNIT MONTH (AUM):** The amount of forage needed to sustain one cow, five sheep, or five goats for a month.

**ANNUAL PLANT:** A plant that completes its life cycle and dies in one year or less. Also see PERENNIAL PLANT.

**APICAL MERISTEM:** Area of undifferentiated plant tissue at the tip of the root or shoot from which new cells arise; growing point at the tip of the root or stem in vascular plants.

**AQUATIC HABITATS:** Habitats confined to streams, rivers, springs, lakes, ponds, reservoirs, and other water bodies.

**AQUIFER:** A water-bearing bed or layer of permeable rock, sand, or gravel capable of yielding large amounts of water.

**AQUIFER RECHARGE:** The adding of water to an aquifer, a process that occurs naturally from the infiltration of rainfall and from water flowing over earth materials that allow it to infiltrate below the land surface.

**AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC):** A designated area on public lands where special management attention is required: (1) to protect and prevent irreparable damage to fish and wildlife; (2) to protect important historic, cultural, or scenic values; or other natural systems or processes, or (3) to protect life and safety from natural hazards.

**ARIZONA STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING ADMINISTRATION:** Standards and guidelines developed collaboratively by BLM and the Arizona Resource Advisory Council (RAC) to address the minimum requirements of the Department of the Interior's final rule for Grazing Administration, effective Aug. 21, 1995.

**ASPECT:** See VISUAL ASPECT.

**AVAILABLE FORAGE:** ~~Forage that can be grazed and still allow sustained forage production on rangeland. Available forage may or may not be authorized for grazing.~~

**BAJADA:** A broad continuous slope extending along and from the base of a mountain range and formed by coalescing alluvial fans.

**BAR:** A ridgelike accumulation of sand, gravel, or other alluvial material formed in the channel, along the banks, or at the mouth of a stream where a decrease in velocity induces deposition. Also see WATER BAR.

**BASE FLOW (DISCHARGE):** The portion of stream discharge derived from such natural storage sources as groundwater, large lakes, and swamps but not derived from direct runoff or flow from stream regulation, water diversion, or other human activities.

**BASE HERD:** The constant livestock herd size that is continually licensed but may not be the same as the grazing (carrying) capacity. Also see GRAZING CAPACITY.

**BASE LEVEL:** The lowest level to which a land surface can be reduced by the action of running water.

**BASE METAL:** A metal inferior in value to gold and silver; a term generally applied to the commercial metals such as copper and lead.

**BASIN (INTERMONTANE BASIN):** A broad structural lowland between mountain ranges, commonly elongated and many miles across.

**BIOLOGICAL ASSESSMENT:** Information prepared by or under the direction of a federal agency to determine whether a proposed action is likely to: (1) harm threatened or endangered species or designated critical habitat, (2)

jeopardize the existence of species that are proposed for listing, or (3) adversely modify proposed critical habitat. Biological assessments must be prepared for major construction activities. The outcome of a biological assessment determines whether formal Section 7 consultation or a conference is needed. Also see BIOLOGICAL EVALUATION.

#### **BIOLOGICAL DIVERSITY**

**(BIODIVERSITY):** The full range of variability within and among living organisms and the ecological complexes in which they occur. Biological diversity encompasses ecosystem or community diversity, species diversity, and genetic diversity.

**BIOLOGICAL EVALUATION:** The gathering and evaluation of information on proposed endangered and threatened species and critical and proposed critical habitat for actions that do not require a biological assessment. Also see BIOLOGICAL ASSESSMENT.

**BIOLOGICAL OPINION:** A document that includes the following: (1) the opinion of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service as to whether a federal action is likely to jeopardize the existence of a species listed as threatened or endangered or destroy or adversely modify designated critical habitat, (2) a summary of the information on which the opinion is based, and (3) a detailed discussion of the effects of the action on listed species or designated critical habitat.

**BIOLOGICAL PLANNING PROCESS:** The process proposed by Alternative 2 of this plan and EIS, by which a Biological Planning Team would: (1) determine the current health and trend of rangeland resources in the Empire-Cienega Planning Area, (2) evaluate proposed grazing and recreation actions in light of

## *Glossary*

resource conditions and concerns and objectives of the Empire-Cienega Integrated Resource Management Plan, and (3) recommend to BLM annual authorizations for livestock grazing and changes to recreation authorizations or site uses.

**BIOLOGICAL PLANNING TEAM:** Under Alternative 2 of this plan and EIS, a team that would meet at least twice a year to: (1) determine the current health and trend of rangeland resources in the Empire-Cienega Planning Area, (2) evaluate proposed grazing and recreation actions in light of resource conditions and concerns and objectives of the Empire-Cienega Integrated Resource Management Plan, and (3) recommend to BLM annual authorizations for livestock grazing and changes to recreation authorizations or site uses. The proposed Biological Planning Team would consist of a balance among resource managers, resource users, and people concerned about proper resource management.

**BIOMASS:** The total amount of living matter in a given unit of the environment.

**BIOTIC:** Pertaining to life or living; the living components of the environment. Also see ABIOTIC.

**BLM SENSITIVE SPECIES:** See SENSITIVE SPECIES.

**BOSQUE:** A woodland dominated by trees more than 15 feet tall.

**BRAIDING:** A pattern of an interlacing or tangled network of several branching and reuniting stream channels separated by branch islands or channel bars.

**BROWSE:** The part of leaf and twig growth of shrubs, woody vines, and trees available for animal consumption.

**CANDIDATE SPECIES:** Species not protected under the Endangered Species Act, but being considered by the U.S. Fish and Wildlife Service for inclusion on the list of federally threatened and endangered species.

**CANOPY:** The cover or leaves of branches formed by the tops or crowns of plants as viewed from above the cover, measured by the vertical projection downward of the extent of the cover and expressed as a percentage of the ground so covered.

**CARBON-14 DATING:** A method of estimating the age of an artifact containing carbon by measuring the radioactivity of its carbon-14 content to determine how long ago the specimen was separated from equilibrium with the atmosphere-plant-animal cycle. Continuously produced in the atmosphere by cosmic-ray bombardment, carbon-14 decays with a half-life typically described as 5,568 years. An object is dated by comparing its carbon-14 activity per unit mass with that in a contemporary sample.

**CARRYING CAPACITY (WILDLIFE):** The most animals a specific habitat or area can support without causing deterioration or degradation of that habitat. Also see GRAZING CAPACITY.

**CASUAL USE (MINING):** Mining that only negligibly disturbs federal lands and resources and does not include the use of mechanized earth moving equipment or explosives or motorized equipment in areas closed to off-highway vehicles. Casual use generally includes panning, nonmotorized sluicing, and collecting mineral specimens using hand tools.

**CASUAL USE (RECREATION):** Noncommercial or nonorganized group or individual activities on public land. **Complies**

with land use decisions and designations, i.e., Special Area Designations, does not award cash prizes, is not publicly advertised, poses minimal risk for damage to public land or related water resource values, and generally requires no monitoring. If the use goes beyond those conditions, the activity should be treated as any other organized recreational group or competitive activity or event for which BLM would require the event organizer to obtain an SRP.

**CASUAL USE OF MINERAL**

**MATERIALS:** Extracting mineral materials for limited personal (noncommercial) uses.

**CATEGORICAL EXCLUSION:** A category of federal actions that do not individually or cumulatively have a significant effect on the human environment and for which neither an environmental impact statement nor an environment assessment is required.

**CATTLE YEAR-LONG (CYL):** The amount of forage needed to sustain one cow for a 1-year period. One CYL equals 12 animal unit months (AUMs). Also see ANIMAL UNIT MONTH.

**CERARGYRITE:** Horn silver. Silver chloride (AgCl) which contains 75% silver.

**CERUSSITE:** A lead carbonate (PbCO<sub>3</sub>).

**CHAINING:** A mechanical vegetation treatment in which two tractors drag an anchor chain extended between them over the terrain to uproot brush and small trees.

**CHANNEL:** A natural or artificial watercourse with a definite bed and banks to confine and conduct continuously or periodically flowing water.

**CHANNEL MORPHOLOGY:** The structure and form of a stream channel.

**CIENEGA:** A marshy or swampy area where the ground is wet due to the presence of seepage or springs.

**CLASS I AIR QUALITY RATING:** Under the Clean Air Act, the rating given areas of the country selected to receive the most stringent degree of air quality protection. Also see CLASS II AIR QUALITY RATING.

**CLASS II AIR QUALITY RATING:** Under the Clean Air Act, the rating given areas of the country selected for somewhat less stringent protection from air pollution damage than Class I areas, except in specified cases. Also see CLASS I AIR QUALITY RATING.

**CLIMAX:** A plant community's final and highest ecological development which emerges after a series of successive vegetational stages. The climax community perpetuates itself indefinitely unless disturbed by outside forces. Also see DISCLIMAX.

**COLONIZATION:** Occupation of an area by a group of organisms which previously did not occupy the area.

**COMMUNITY:** A collective term used to describe an assemblage of organisms living together; an association of living organisms having mutual relationships among themselves and with their environment and thus functioning at least to some degree as an ecological unit.

**CONSERVATIVE STOCKING RATE:** A stocking rate 15 to 25% below grazing capacity. Also see STOCKING RATE and GRAZING CAPACITY.

**CONSERVATION EASEMENT:** An easement to assure the permanent preservation of land in its natural state or in whatever degree of naturalness the land has when the easement is granted. Also see EASEMENT.

**COOL-SEASON PLANTS:** Plants whose major growth occurs during the late fall, winter, and early spring. Also see WARM-SEASON PLANTS.

**COOPERATIVE MANAGEMENT AGREEMENT:** A document that describes agreements made between BLM and the public on adjusting grazing use. This document also defines the specific adjustments and the schedule of adjustments (usually over a five-year period).

**CORRIDOR:** See DESIGNATED CORRIDOR.

**COVER:** (1) Plants or plant parts, living or dead, on the surface of the ground; (2) Plants or objects used by wild animals for nesting, rearing of young, escape from predators, or protection from harmful environmental conditions.

**COW-CALF LIVESTOCK OPERATION:** A livestock operation that maintains a base breeding herd of mother cows and bulls. The cows produce a calf crop each year and the operation keeps some heifer calves from each calf crop for breeding replacements. Between the ages of 6 and 12 months, the operation sells the rest of the calf crop along with old and nonproductive cows and bulls.

**CRETACEOUS:** In geologic history the third and final period of the Mesozoic era, from 144 million to 65 million years ago, during which extensive marine chalk beds formed.

**CRITICAL HABITAT, DESIGNATED:** Specific parts of an area that are occupied by a federally listed threatened or endangered plant or animal at the time it is listed and that contain physical or biological features essential to the conservation of the species or that may require special management or protection. Critical habitat may also include specific areas outside an area occupied by a federally listed species if the Secretary of the Interior determines that these areas are essential for conserving the species.

**CROSSING LANE:** A fenced corridor that allows livestock to cross a stream without spreading out into the water.

**CULTURAL RESOURCE (CULTURAL PROPERTY):** A location of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. Cultural resources include archaeological, historical, or architectural sites, structures, or places with important public and scientific use. Cultural resources may include definite locations of traditional, cultural or religious importance to specified social or cultural groups.

**CULTURAL RESOURCE DATA:** Cultural resource information embodied in material remains and manifested in studies, notes, records, diaries, analyses, and published and unpublished manuscripts.

**CULTURAL RESOURCE DATA RECOVERY:** The professional application of archaeological techniques of controlled observation, collection, excavation, and/or removal of physical remains including analysis, interpretation, explanation, and preservation of recovered remains and associated records in an appropriate curatorial facility used as a means of protection. Data recovery may sometimes

employ professional collection of such data as oral histories, genealogies, folklore, and related information to portray the social significance of the affected resources.

**CULTURAL RESOURCE INVENTORY**

**(SURVEY):** A descriptive listing and documentation including photographs and maps of cultural resources. Included in an inventory are the processes of locating, identifying, and recording sites, structures, buildings, objects, and districts through library and archival research, information from persons knowledgeable about cultural resources, and on-the-ground surveys of varying intensity.

**Class I:** A professionally prepared study that compiles, analyzes, and synthesizes all available data on an area's cultural resources. Information sources for this study include published and unpublished documents, BLM inventory records, institutional site files, and state and National Register files. Class I inventories may have prehistoric, historic, and ethnological and sociological elements. These inventories are periodically updated to include new data from other studies and Class II and III inventories.

**Class II:** A professionally conducted, statistically based sample survey designed to describe the probable density, diversity, and distribution of cultural properties in a large area. This survey is achieved by projecting the results of an intensive survey carried out over limited parts of the target area. Within individual sample units, survey aims, methods, and intensities are the same as those applied in Class III inventories. To improve statistical reliability, Class II inventories may be conducted in several phases with different sample designs.

**Class III:** A professionally conducted intensive survey of an entire target area aimed at locating and recording all visible cultural properties. In a Class III survey, trained observers commonly conduct systematic inspections by walking a series of close-interval parallel transects until they have thoroughly examined an area.

**CULTURAL RESOURCE PROJECT**

**PLAN:** A detailed design plan for cultural resource projects such as structure stabilization, research efforts, interpretive development, and restrooms. These plans include estimates on workforce, equipment, and supply needs.

**CUMULATIVE IMPACTS:** Impacts that result from the incremental changes from all planned actions when added to other past, present, and reasonably foreseeable changes. Cumulative impacts can also result from individually minor, but collectively significant actions taking place over time.

**CYPRINID:** Any of a family (Cyprinidae) of freshwater fishes that include the carps and minnows.

**DATA RECOVERY:** See CULTURAL RESOURCE DATA RECOVERY.

**DECISION RECORD:** A manager's decision on a categorical exclusion review or an environmental assessment. Comparable to the record of decision for an environmental impact statement, the decision record includes: (1) a finding of no significant impact, (2) a decision to prepare an environmental impact statement, or (3) a decision not to proceed with a proposal. Also see RECORD OF DECISION.

## *Glossary*

**DEFERRED ROTATION GRAZING:**

Moving grazing animals to various parts of a range in succeeding years or seasons to provide for seed production, plant vigor, and seedling growth.

**DESIGNATED CORRIDOR:**

BLM's preferred route for placing rights-of-way for utilities (i.e., pipelines and powerlines) and transportation (i.e., highways and railroads).

**DESIRED PLANT COMMUNITY:**

The plant community that has been determined through a land use or management plan to best meet the plan's objectives for a site. A real, documented plant community that embodies the resource attributes needed for the present or potential use of an area, the desired plant community is consistent with the site's capability to produce the required resource attributes through natural succession, management intervention, or a combination of both.

**DETRITAL COVER:** Cover that consists of dead organic matter.

**DETRITUS:** Disintegrated matter, such as rock fragments or organic debris accumulated in pond water, mud, or soil.

**DIKE:** An upright or steeply dipping sheet of igneous rock that has solidified in a crack or fissure in the earth's crust; a human-made structure used to control stream flow.

**DIRECTIONAL DRILLING:** The drilling of a borehole at an angle from the vertical to reach a subsurface area that is not directly beneath the point where the bit enters the earth.

**DISCHARGE (WATER):** The rate of flow or volume of water that passes a given point within a stream during given period of time. Also see INSTANTANEOUS DISCHARGE.

**DISCLIMAX:** An enduring climax community altered by human or livestock disturbance, such as a grassland that has replaced a deciduous forest. Also see CLIMAX.

**DISPERSED RECREATION:** Recreation activities that do not require developed sites or facilities.

**DISTURBANCE REGIME:** The regular pattern of occurrence or characteristic behavior of disturbance which includes type, intensity, frequency, and spatial extent.

**DIVISION FENCE:** A fence that separates pastures or allotments.

**DRAW:** A natural drainage basin or gully.

**EASEMENT:** The right to use land in a certain way granted by a landowner to a second party. Also see CONSERVATION EASEMENT.

**ECOLOGICAL CONDITION:** See ECOLOGICAL SITE RATING.

**ECOLOGICAL INTEGRITY:** The quality of a natural unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species, and ecosystem diversity assured for the future.

**ECOLOGICAL NICHE:** See NICHE.

**ECOLOGICAL SITE (RANGE SITE):** A distinctive kind of land that has specific physical characteristics and that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation.

**ECOLOGICAL SITE DESCRIPTIONS (RANGE SITE GUIDE):** Descriptions of the following characteristics of an ecological site: soils, physical features, climatic features, associated hydrologic features, plant

communities possible on the site, plant community dynamics, annual production estimates and distribution of production throughout the year, associated animal communities, associated and similar sites, and interpretations for management.

**ECOLOGICAL SITE INVENTORY:** The basic inventory of present and potential vegetation on BLM rangeland.

**ECOLOGICAL SITE RATING (ECOLOGICAL CONDITION/ ECOLOGICAL STATUS):** The present state of vegetation of an ecological site in relation to the potential natural community for the site. Independent of the site's use, the ecological site rating is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a community resemble those of the potential natural community. The four ecological status classes correspond to 0-25%, 25-50%, 51-75%, or 76-100% similarity to the potential natural community and are called early-seral, mid-seral, late-seral, and potential natural community, respectively.

**ECOSYSTEM:** Organisms, together with their abiotic environment, forming an interacting system and inhabiting an identifiable space.

**ECOTOURISM:** Tourism that essentially focuses on natural rather than developed attractions with the goal of enhancing the visitor's understanding and appreciation of nature and natural features. Such tourism often attempts to be environmentally sound and to contribute economically to the local community.

**ELECTROFISHING (ELECTROSHOCKING):** A fish collection method employed by professional fishery biologists using a pulse of electricity to stun fish.

**ELIGIBLE RIVER SEGMENT:** Qualification of a river for inclusion into the National Wild and Scenic Rivers System by determining that it is free flowing and, with its adjacent land area, has at least one river-related value considered to be outstandingly remarkable.

**EMERGENT VEGETATION:** Aquatic plant species that are rooted in wetlands but extend above the water's surface. Also see SUBMERGENT VEGETATION.

**ENDANGERED SPECIES:** Any animal or plant species in danger of extinction throughout all or a significant portion of its range as designated by the U.S. Fish and Wildlife Service under the Endangered Species Act. Also see THREATENED SPECIES.

**ENERGY FLOW:** The intake, conversion, and passage of energy through organisms or through an ecosystem.

**ENTRENCHMENT:** The process by which a stream erodes downward (incision) creating vertical, often eroding banks and abandoning its flood plain. Entrenched streams are often referred to as gullies.

**ENVIRONMENTAL ASSESSMENT (EA):** A concise public document for which a federal agency is responsible. An EA serves: (1) to briefly provide enough evidence and analysis for determining whether to prepare an environmental impact statement (EIS) or a finding of no significant impact and to aid an agency's compliance with the National Environmental Policy Act when no EIS is needed; and (2) to facilitate preparing an EIS when one is needed. Also see ENVIRONMENTAL IMPACT STATEMENT.



## *Glossary*

### **ENVIRONMENTAL IMPACT**

**STATEMENT (EIS):** An analytical document that portrays potential impacts on the human environment of a particular course of action and its possible alternatives. Required by the National Environmental Policy Act (NEPA), an EIS is prepared for use by decision makers to weigh the environmental consequences of a potential decision. Also see ENVIRONMENTAL ASSESSMENT.

**ENVIRONMENTAL JUSTICE (EJ):** The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income in developing, implementing, and enforcing environmental laws, regulations, and policies.

**EPHEMERAL STREAM:** A stream or portion of a stream that: (1) flows only in direct response to precipitation, (2) receives little or no water from springs or no long continued supply from snow or other sources, and (3) has a channel that is always above the water table.

**ETHNOECOLOGY:** The study of the relationship between a society and its natural environment including the spatio-temporal organization of human activities and how nature and natural resources are used (i.e., hunting, fishing, collecting, farming, preparing food); the study of how people perceive and manipulate their environments.

**EXCLOSURE:** An area fenced to exclude animals.

**EXOTIC:** An organism or species that is not native to the region in which it is found.

**EXTIRPATED SPECIES:** A locally extinct species; a species that is no longer found in a locality but exists elsewhere.

**EXTIRPATION:** See EXTIRPATED SPECIES.

**FAULT BLOCK MOUNTAINS (BLOCK MOUNTAINS):** Mountains formed by block faulting which divides the earth's crust into fault blocks of different elevations and orientations.

**FECAL COLIFORM BACTERIA:** A group of organisms found in the intestinal tracts of people and animals. Their presence in water shows pollution and possible dangerous bacterial contamination.

**FECAL STREPTOCOCCUS (STREP) BACTERIA:** Bacteria of the intestinal tract with the ability to grow at relatively high pH and temperature and used as an indicator of recent fecal pollution by warm-blooded animals, including humans.

**FEDERAL LAND POLICY AND MANAGEMENT ACT (FLPMA):** The act that: (1) set out, for the Bureau of Land Management, standards for managing the public lands including land use planning, sales, withdrawals, acquisitions, and exchanges; (2) authorized the setting up of local advisory councils representing major citizens groups interested in land use planning and management, (3) established criteria for reviewing proposed wilderness areas, and (4) provided guidelines for other aspects of public land management such as grazing.

**FEE SIMPLE TITLE:** Unrestricted ownership of real property (i.e., land and whatever is erected or growing on it).

**FINDING OF NO SIGNIFICANT IMPACT (FONSI):** A document that is prepared by a federal agency and that briefly explains why an action not otherwise excluded from the requirement to prepare an environmental impact

statement (EIS) would not significantly affect the human environment and not require an EIS.

**FINE PARTICULATE MATTER (PM<sup>2.5</sup>):** Particulate matter that is less than 2.5 microns in diameter. Also see PARTICULATE MATTER and INHALABLE PARTICULATE MATTER.

**FIRE INTENSITY:** The rate of heat release for an entire fire at a specific time.

**FIRE SUPPRESSION:** All the work of extinguishing or confining a fire, beginning with its discovery.

**FIXED STOCKING RATE:** A stocking rate that is fixed and cannot vary from season to season or year to year. Also see STOCKING RATE and VARIABLE STOCKING RATE.

**FLOODPLAIN:** Nearly level land on either or both sides of a channel that is subject to overflow flooding. Also see HUNDRED-YEAR FLOOD and HUNDRED-YEAR FLOODPLAIN.

**FORAGE:** All browse and herbage that is available and acceptable to grazing animals or that may be harvested for feed.

**FORB:** A herbaceous plant that is not a grass, sedge, or rush.

**FREE USE PERMIT:** A permit that allows the removal of timber or other resources from the public lands free of charge.

**FUEL LOAD (IN FIRE SUPPRESSION):** The oven-dry weight of fuel per unit area usually expressed in tons/acre.

**FUEL MOISTURE CONTENT (FUEL MOISTURE) (IN FIRE SUPPRESSION):**

The water content of a fuel expressed as a percentage of the fuel's oven-dry weight. For dead fuels, which have no living tissue, moisture content is determined almost entirely by relative humidity, precipitation, dry-bulb temperature, and solar radiation. The moisture content of live fuels is physiologically controlled within the living plant.

**FUNCTIONING WATERS (WILDLIFE):** A well, catchment, spring, reservoir, or other feature (human made or natural) that provides a reliable source of potable water on a year-long basis. For such a source of water to be considered functional, the quality and quantity of water must be sufficient to sustain native wildlife populations in the local area. For example, a reservoir that fills up during monsoon rains but goes dry in a few weeks is not functional from a wildlife standpoint.

**GALLERY (GALLERY FOREST):** A forest growing along a water course in a region otherwise devoid of trees.

**GENERALIST:** An organism that can survive under a wide variety of conditions and does not specialize to live under any particular set of circumstances.

**GLIDE:** A slow-moving, relatively shallow area of flowing water that lacks surface agitation or waves and approximates uniform flow and in which the slope of the water surface is roughly parallel to the overall gradient of the stream reach.

**GRASS BANK:** An unallocated allotment used as a short-term reserve forage supply where livestock from another allotment can graze during drought or in place of another allotment that has undergone fire or vegetation treatment. Also see VEGETATION TREATMENTS.

## *Glossary*

**GRAZING CAPACITY (CARRYING CAPACITY):** The highest livestock stocking rate possible without damaging vegetation or related resources. Grazing capacity may vary from year to year or in the same area because of fluctuating forage production.

**GRAZING CYCLE:** The amount of time required for livestock to rotate completely through all the pastures in an allotment management plan.

**GRAZING PERMIT/LICENSE/LEASE:** Official written permission to graze a specific number, kind, and class of livestock for a specified period on a defined rangeland.

**GRAZING PRIVILEGES:** The use of public land for livestock grazing under permits or leases.

**GRAZING REST:** Any period during which no livestock grazing is allowed within an area.

**GRAZING SEASON:** An established period for which grazing permits are issued.

**GRAZING SYSTEM:** A systematic sequence of grazing use and nonuse of an allotment to meet multiple use goals by improving the quality and amount of vegetation.

**GROUND COVER:** See COVER.

**GROUNDWATER:** Subsurface water and underground streams that supply wells and springs. Use of groundwater in Arizona does not require a water right, but must only be “reasonable.” Groundwater is separated from surface water by the type of alluvium in which the water is found. Water in the younger, floodplain alluvium is considered surface water. Water in the older, basin-fill alluvium is considered groundwater.

**GROUP:** More than 29 people (i.e., for a recreation site in the Empire-Cienega Planning Area).

**GULLY:** A channel or miniature valley cut by concentrated runoff but through which water commonly flows only during and immediately after heavy rains or while snow is melting.

**GULLY EROSION:** The erosion process by which water flows through narrow channels and over short periods removes the soil from this narrow area to depths ranging from 1-2 feet to as much as 75-100 feet.

**GULLY PLUG: (CHECK DAM):** A low dam, built of a wide variety of material including logs, treated lumber, stone, concrete, and synthetic materials, and used to flatten the slope of the gully, dissipate the energy of moving water, and control gully erosion.

**HABITAT:** An area that provides an animal or plant with adequate food, water, shelter, and living space.

**HABITAT FRAGMENTATION:** Process by which habitats are increasingly subdivided into smaller units resulting in their increased insularity and losses of total habitat area.

**HABITAT MANAGEMENT PLAN:** A site-specific wildlife habitat plan.

**HALF-SHRUB:** A perennial plant with a woody base whose annually produced stems die each year.

**HAZARDOUS MATERIALS (HAZMAT):** An all-encompassing term that includes hazardous substances; hazardous waste; hazardous chemical substances; toxic substances; pollutants and contaminants; and

imminently hazardous chemical substances and mixtures that can pose an unreasonable risk to human health, safety, and property.

**HEADCUT:** The abrupt change in elevation at the head of a gully.

**HEADCUTTING:** The erosional process by which a gully migrates up slope by water flowing in at its head. Headcutting is characterized by an increase in depth and width and a decrease in slope.

**HEAP LEACHING:** A low-cost technique for extracting metals from ore by percolating leaching solutions through heaps of ore placed on impervious pads. This method is generally used on low-grade ores.

**HERBACEOUS:** Of, relating to, or having the characteristics of a vascular plant that does not develop woody tissue.

**HISTORIC STRUCTURE REPORT:** The documentation of the physical condition of a historic structure and measures needed to preserve it.

**HOHOKAM:** A group of North American Indians who lived between perhaps 300 BC and AD 1400 in central and southern Arizona, largely along the Gila and Salt rivers.

**HOLDING AREA (HOLDING GROUND):** An area where livestock are often held during roundups.

**HUNDRED-YEAR FLOOD:** A flood that has a 1 in 100 chance of occurring in any given year.

**HUNDRED-YEAR FLOODPLAIN:** The area flooded by a 100-year flood.

**HYDRIC:** Characterized by, relating to, or requiring an abundance of moisture.

**HYDROLOGIC CYCLE:** The circuit of water movement from the atmosphere to the earth and its return to the atmosphere through various stages or processes, such as precipitation, interception, runoff, infiltration, percolation, storage, evaporation, and transpiration.

**IGNEOUS ROCK:** Rock, such as granite and basalt, that has solidified from a molten or partially molten state.

**INCIDENT COMMANDER:** The person responsible for managing all operations in response to incidents (i.e., wildfires and other events requiring emergency action).

**INDICATORS:** Elements of the human environment affected, or potentially affected, by a change agent. An indicator can be a structural component, a functional process or an index. A key indicator integrates several system elements in such a way as to indicate the general health of that system.

**INDIVIDUAL GRAZING ALLOTMENT:** A grazing allotment on which a single permittee grazes livestock.

**INFILTRATION:** The downward entry of water into the soil or other material.

**INFRASTRUCTURE:** The set of systems and facilities that support a region or community's social and economic structures. Examples of such systems include energy, transportation, communication, education, medical service, and fire and police protection.

## *Glossary*

**INHALABLE PARTICULATE MATTER (PM<sup>10</sup>):** Particulate matter in ambient air exceeding 10 microns in diameter. Also see PARTICULATE MATTER and FINE PARTICULATE MATTER.

**INSTANTANEOUS DISCHARGE:** The volume of water that passes a given point at a particular instant of time. Also see DISCHARGE.

**INSTREAM WATER USE:** Water use within a stream channel for such purposes as navigation, recreation, fish and wildlife preservation, water quality improvement, and hydroelectric power generation.

**INSTREAM WATER RIGHT (INSTREAM FLOW WATER RIGHT):** A water right that reserves water for and protects such specific instream water uses as fish spawning and recreation. The instream water right allows water needed for these activities to be set aside and keeps later water users from appropriating water that may affect the instream activity. (Also see INSTREAM WATER USE.)

**INTEGRATED VEGETATION MANAGEMENT:** A vegetation management approach that consists of selecting and integrating treatment methods for predicted ecological, sociological, and economic effects. Where proposed for the Empire-Cienega Planning Area, this approach would allow the use of prescribed burning and chemical (mainly herbicide) applications as well as manual, mechanical, and biological treatments. Under this approach, BLM will select vegetation treatments for a particular project in response to site-specific analyses.

**INTERMITTENT STREAM:** A stream that generally flows during wet seasons, but is dry during dry seasons.

**INVASIVE SPECIES (INVADERS):** Plant species that were either absent or present only in small amounts in undisturbed portions of a specific range site's original vegetation and invade following disturbance or continued overuse.

**KEY FORAGE SPECIES:** Forage species whose use serves as an indicator of the degree of use of associated species.

**KEYSTONE SPECIES:** Species that create a special habitat on which other species depend and without which some wildlife would become severely depleted. Two examples of key stone species are beavers, which create ponds, and prairie dogs, which create burrows.

**LAND AND WATER CONSERVATION FUND:** Established by the Land and Water Conservation Fund Act, a fund that the federal government can use to acquire and develop land and water for conservation and outdoor recreation and to help states in planning for, acquiring, and developing land and water areas and facilities.

**LAND USE AUTHORIZATION:** BLM's authorizing through leases, permits, and easements of uses of the public land. Land use authorizations may allow occupancy, recreational residences and cabin sites, farming, manufacturing, outdoor recreation concessions, National Guard maneuvers, and many other uses.

**LARAMIDE OROGENY:** A series of mountain building events that affected much of western North America in Late Cretaceous and Early Tertiary periods. (The Cretaceous period ended 65 million years ago and was followed by the Tertiary period.)

**LEASABLE MINERALS:** Minerals whose extraction from federally managed land requires a lease and the payment of royalties. Leasable minerals include coal, oil and gas, oil shale and tar sands, potash, phosphate, sodium, and geothermal steam.

**LEAVE NO TRACE:** A nationwide (and international) program to help visitors with their decisions when they travel and camp on America's public lands. The program strives to educate visitors about the nature of their recreational impacts as well as techniques to prevent and minimize such impacts.

**LITTER:** The uppermost layer of organic debris on the soil surface, essentially freshly fallen or slightly decomposed vegetal material.

**LIVE FUEL MOISTURE:** See FUEL MOISTURE.

**LIVESTOCK PERFORMANCE:** The efficiency of livestock within an operation as measured by such indicators as percent calf crop, weaned calf weights, animal death rates, and cull cow weights.

**LIVESTOCK TRESPASS:** The unauthorized grazing of livestock.

**LOAM:** A soil texture class for soil material that contains 7 to 27% clay, 28 to 50% silt, and less than 52% sand.

**LOCATABLE MINERALS:** Minerals that may be acquired under the Mining Law of 1872, as amended.

**LOCATION:** The act of taking or appropriating a parcel of mineral land including the posting of notices, the recording thereof when required, and marking the boundaries so they can be readily traced.

**LONG-TERM MANAGEMENT AREAS (LTMA)s:** Twenty-four areas established by the Land Tenure Amendment to BLM Safford District's Resource Management Plan in 1994 to be intensively managed for their multiple resource values as defined in the Federal Land Policy and Management Act of 1976. In these LTMA)s BLM will retain all public land (surface and subsurface) and may seek to acquire state and private lands. Also see RESOURCE CONSERVATION AREA.

**MACROPHYTE:** Any plant that can be seen with the unaided eye such as aquatic mosses, ferns, liverworts, and rooted plants.

**MADREAN:** Characteristic of or relating to the Sierra Madre of Mexico.

**MAJOR LAND RESOURCE AREAS (MLRA)s:** Broad geographic areas that have a particular pattern of soils, climate, water resources, vegetation, and land use. Each MLRA in which range and forest land occur is further broken into range sites.

**MAJOR RIGHTS-OF-WAY:** Rights-of-way along which pass transmission lines (consisting of 115kV or higher) used to transmit large blocks of energy to load centers for distribution.

**MANAGEMENT SITUATION ANALYSIS (MSA):** Step 4 in BLM's resource management planning process. An MSA describes a planning area's current public land management and suggests opportunities to better manage this land.

**MERISTEM:** The tissue or zone in a plant from which new cells are produced by cell division.

## *Glossary*

**MESOZOIC ERA:** One of the great eras of geologic time (248 million to 65 million years ago), following the Paleozoic era, preceding the Cenozoic era, and including the Triassic, Jurassic, and Cretaceous periods.

**MICROHABITAT:** The smallest unit of a habitat, like a clump of grass or a space between rocks.

**MINERAL ENTRY:** The filing of a claim on public land to obtain the right to any minerals it may contain.

**MINERALIZATION:** The processes taking place in the earth's crust resulting in the forming of valuable minerals or ore bodies.

**MINERAL MATERIALS:** Materials such as common varieties of sand, stone, gravel, pumice, pumicite, and clay that are not obtainable under the mining or leasing laws but that can be acquired under the Mineral Materials Act of 1947, as amended.

**MINERAL WITHDRAWAL:** A formal order that withholds federal lands and minerals from entry under the Mining Law of 1872 and closes the area to mineral location (staking mining claims), development, and leasing.

**MINING DISTRICT:** An area, usually designated by name, with described or understood boundaries, where minerals are found and mined under rules prescribed by the miners, consistent with the Mining Law of 1872.

**MINING PLAN OF OPERATIONS:** A plan for mineral exploration and development that a mining operator must submit to BLM for approval for all mining, milling, and bulk sampling of more than 1,000 tons and for exploration disturbing more than five acres or on special status lands, including wilderness,

areas of critical environmental concern, national monuments, national conservation areas, and lands containing proposed or listed threatened or endangered species or their critical habitat. A plan of operations must document in detail all actions that the operator plans to take from exploration through reclamation.

**MONITORING:** The collection of information to determine the effects of resource management and detect changing resource trends, needs, and conditions.

**MOSAIC:** A pattern of vegetation in which two or more kinds of communities are interspersed in patches.

**MOTORIZED TRAIL:** A designated route that allows for the use of small-wheel-based motorized vehicles such as all-terrain vehicles and motorcycles.

**MULTIPLE USE:** A combination of balanced and diverse resource uses that considers long-term needs for renewable and nonrenewable resources including recreation, wildlife, rangeland, timber, minerals, and watershed protection, along with scenic, scientific, and cultural values.

**NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS):** The allowable concentrations of air pollutants in the ambient (public outdoor) air specified in 40 CFR 50. National ambient air quality standards are based on the air quality criteria and divided into primary standards (allowing an adequate margin of safety to protect the public health including the health of "sensitive" populations such as asthmatics, children, and the elderly) and secondary standards (allowing an adequate margin of safety to protect the public welfare). Welfare is defined as including effects on soils, water, crops, vegetation, human-made materials,

animals, wildlife, weather, visibility, climate, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.

**NATIONAL CONSERVATION AREA (NCA):** A congressionally designated public land area that contains important resources and whose management objectives are: (1) to conserve and protect these resources, (2) to maintain environmental quality, and (3) to provide for present and future users within a framework of multiple use and sustained yield.

**NATIONAL ENVIRONMENTAL POLICY ACT (NEPA):** The federal law, effective January 1, 1970, that established a national policy for the environment and requires federal agencies: (1) to become aware of the environmental ramifications of their proposed actions, (2) to fully disclose to the public proposed federal actions and provide a mechanism for public input to federal decision making, and (3) to prepare environmental impact statements for every major action that would significantly affect the quality of the human environment.

**NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED (NHPA):** A federal statute that established a federal program to further the efforts of private agencies and individuals in preserving the Nation's historic and cultural foundations. The National Historic Preservation Act: (1) authorized the National Register of Historic Places, (2) established the Advisory Council on Historic Preservation and a National Trust Fund to administer grants for historic preservation, and (3) authorized the development of regulations to require federal agencies to consider the effects of federally assisted activities on properties included on or eligible for the National Register of Historic Places. Also see NATIONAL REGISTER OF HISTORIC PLACES.

**NATIONAL REGISTER OF HISTORIC PLACES:** The official list, established by the National Historic Preservation Act, of the Nation's cultural resources worthy of preservation. The National Register lists archeological, historic, and architectural properties (i.e., districts, sites, buildings, structures, and objects) nominated for their local, state, or national significance by state and federal agencies and approved by the National Register Staff. The National Park Service maintains the National Register. Also see NATIONAL HISTORIC PRESERVATION ACT.

**NATIONAL REGISTER QUALITY (CULTURAL RESOURCES):** Cultural resource properties that meet the National Register criteria and have been determined eligible for nomination to the National Register of Historic Places because of their local, state, or national significance.

**NATIONAL WILD AND SCENIC RIVERS SYSTEM:** A system of nationally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historical, cultural, and other similar values and are preserved in a free-flowing condition. The system consists of three types of streams: (1) recreation—rivers or sections of rivers that are readily accessible by road or railroad and that may have some development along their shorelines and may have undergone some impoundments or diversion in the past, (2) scenic—rivers or sections of rivers free of impoundments with shorelines or watersheds still largely undeveloped but accessible in places by roads, and (3) wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails with watersheds or shorelines essentially primitive and waters unpolluted.



## *Glossary*

**NATIVE DIVERSITY:** The diversity of species that have evolved in a given place without human influence.

**NATIVE SPECIES:** A species that is part of an area's original flora and fauna.

**NEOTROPICAL MIGRATORY BIRDS:** Birds that travel to Central America, South America, the Caribbean, and Mexico during the fall to spend the winter and then return to the United States and Canada during the spring to breed. These birds include almost half of the bird species that breed in the United States and Canada.

**NEST PARASITISM (BROOD PARASITISM):** The exploitation by one bird species of the parental behavior of another species. A nest parasite lays eggs in the nest of another bird species to be cared for by a host. The parasite benefits from saving time, energy, and survival prospects, whereas the host may suffer partial or complete loss of its own current reproduction.

**NEXT BEST PASTURE GRAZING SYSTEM:** A livestock grazing strategy under which, when the desired level of use is made in a pasture, all rested (unused) pastures are evaluated and the pasture that looks best from a grazing standpoint is used next. After the desired level of use is made of that pasture, all rested pastures are examined again and the pasture in best shape is grazed. This is a good system where rainfall patterns are spotty (e.g., the entire allotment hasn't received an equal amount of precipitation). Extremely sensitive to environmental variables, this system gives the operator the most flexibility and provides needed rest for vegetation.

**NICHE:** The role of an organism in the environment, its activities and relationships to the biotic and abiotic environment.

**NICK POINT:** A place of abrupt change in a stream gradient.

**NODE:** A point on a plant's stem from which a leaf or leaves grow.

**NONPOINT SOURCE POLLUTION (WATER):** Pollution sources that are diffuse and do not have a single point of origin or are not introduced into a receiving water body from a specific outlet. These pollutants are generally carried off the land by storm water runoff from such sources as farming, forestry, mining, urban land uses, construction, and land disposal.

**NONUSE:** An authorization that BLM issues to applicants for nonuse of grazing privileges in whole or part, usually for one grazing season.

**NO SURFACE OCCUPANCY:** A fluid mineral leasing stipulation that prohibits occupancy or disturbance on all or part of the lease surface to protect special values or uses. Lessees may explore for or exploit the fluid minerals under leases restricted by this stipulation by using directional drilling from sites outside the no surface occupancy area. Also see **DIRECTIONAL DRILLING**.

**NOXIOUS PLANT:** An unwanted plant specified by federal or state laws as being undesirable and requiring control. Noxious weeds are usually non-natives and highly invasive.

**NUTRIENT CYCLE:** A general term for the movement of any particular life-essential substance through the physical and biological environment. Essential nutrient cycles include those of carbon, nitrogen, oxygen, and water.

**OBLIGATE:** Essential, necessary, unable to exist in any other state, mode, or relationship.

**OFF-HIGHWAY VEHICLE (OHV):** Any vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain, deriving motive power from any source other than muscle. OHVs exclude: (1) any nonamphibious registered motorboat; (2) any fire, emergency, or law enforcement vehicle while being used for official or emergency purposes; and (3) any vehicle whose use is expressly authorized by a permit, lease, license, agreement, or contract issued by an authorized officer or otherwise approved.

**OIL AND GAS SHOW:** The detectable presence of oil or gas in a borehole as determined by examining the core or cuttings.

**OIL SEEP:** A surface location where oil, having permeated its subsurface boundaries, has accumulated in small pools.

**OVERBURDEN:** All the earth and other materials that overlie a natural mineral deposit.

**OVERSTORY:** The portion of the trees in a forest stand forming the upper crown cover. Also see UNDERSTORY.

**PALEONTOLOGICAL RESOURCES:** The remains of plants and animals preserved in soils and sedimentary rock. Paleontological resources are important for understanding past environments, environmental change, and the evolution of life.

**PALEOZOIC ERA:** An era of geologic time (600 million to 280 million years ago) between the Late Precambrian and the Mesozoic eras and comprising the Cambrian, Ordovician, Silurian, Devonian, Mississippian, Pennsylvanian, and Permian periods.

**PANICULATE AGAVE:** A reference to the growth form of certain agave species, such as Palmer's agave (*Agave palmeri*) and Parry's

agave (*Agave parryi*), whose flowers are arranged on the stalk in a pyramidal, loosely branched cluster (panicle). The nectar and pollen of paniculate agaves are consumed by the lesser long-nosed bat, a federally listed endangered species.

**PARTICULATE MATTER:** Fine liquid or solid particles suspended in the air and consisting of dust, smoke, mist, fumes, and compounds containing sulfur, nitrogen, and metals. Also see FINE PARTICULATE MATTER and INHALABLE PARTICULATE MATTER.

**PASTURE:** A grazing area that is separated from other areas by fencing or natural barriers.

**PERFORMANCE:** See LIVESTOCK PERFORMANCE.

**PERENNIAL PLANT:** A plant that has a life cycle of three or more years. Also see ANNUAL PLANT.

**PERENNIAL STREAM:** A stream that flows continuously during all seasons of the year.

**PERSONAL INCOME:** The sum of wage and salary payments, other labor income, proprietors' income, rental income of persons, personal dividend and interest income, and transfer payments to persons, less personal contributions for social insurance.

**PHENOLOGY (PHENOLOGIES):** The study of periodic biological phenomena, such as flowering or seeding, especially as related to climate.

**PIPING:** See SOIL PIPING.

**PITHOUSE:** A wood and earthen structure inhabited by prehistoric American cultures.

## *Glossary*

**PLACER CLAIM:** A mining claim located on surficial or bedded deposits, particularly for gold located in stream gravels.

**PLAN OF OPERATIONS:** See MINING PLAN OF OPERATIONS.

**PLANT VIGOR:** The relative well being and health of a plant as reflected by its ability to manufacture enough food for growth and maintenance.

**PLANT SUCCESSION:** The process of vegetational development by which an area becomes successively occupied by different plant communities of higher ecological order.

**PLEISTOCENE (ICE AGE):** An epoch in the Quarternary period of geologic history lasting from 1.8 million to 10,000 years ago. The Pleistocene was an epoch of multiple glaciation, during which continental glaciers covered nearly one fifth of the earth's land.

**PLUTON:** A typically large body of igneous rock that has formed beneath the earth's surface.

**PONDING:** The formation of ponds by standing water in closed depressions. The water is removed only by deep percolation, transpiration, evaporation, or a combination of these processes.

**POOL:** A portion of a stream that has reduced current velocity and often water deeper than surrounding areas and that is frequently usable by fish for resting and cover.

**POPULATION:** A group of interbreeding organisms of the same kind occupying a particular space. A group of individuals of a species living in a certain area.

**POPULATION CRASH:** A period of heavy death and sharp decline in numbers of an animal species with strongly developed population cycles; the population decline during such a period.

**PORPHYRY COPPER:** A disseminated replacement deposit in which copper minerals occur as discrete grains and veinlets throughout a large volume of rock; a large-tonnage, low-grade copper deposit.

**POTENTIAL NATURAL COMMUNITY (PNC):** The stable biotic community that would become established on an ecological site if all successional stages were completed without human interference under present environmental conditions. The PNC is the vegetation community best adapted to fully use the resources of an ecological site.

**PRESCRIBED FIRE (BURNING):** The planned applying of fire to rangeland vegetation and fuels under specified conditions of fuels, weather, and other variables to allow the fire to remain in a predetermined area to achieve such site-specific objectives as controlling certain plant species; enhancing growth, reproduction, or vigor of plant species; managing fuel loads; and managing vegetation community types.

**PRIME FARMLAND:** As defined by the Farmland Protection Policy Act of 1981, land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of Agriculture. Prime farmland includes land with the above characteristics, but is being used to produce livestock and timber. It does not include land already in or committed to urban development or water storage. Also see UNIQUE FARMLAND.

**PRIMITIVE RECREATION:** Recreation that provides opportunities for isolation from the evidence of humans, a vastness of scale, feeling a part of the natural environment, having a high degree of challenge and risk, and using outdoor skills. Primitive recreation is characterized by meeting nature on its own terms, without comfort or convenience of facilities.

**PROPER FUNCTIONING CONDITION (RIPARIAN-WETLAND AREAS):** The condition where: (1) enough vegetation, landform, or large woody debris is present to dissipate the stream energy of high water flows, thereby reducing erosion and improving water quality; (2) sediments are filtered, bedload is captured, and floodplains develop; (3) flood water retention and ground water recharge are improved, root masses that stabilize streambanks against cutting action develop, and diverse ponding and channel characteristics are created to provide the habitat and the water depth, duration, and temperature needed for fish production, waterfowl breeding, and other uses; and (4) greater biodiversity is supported.

**PROSPECTIVELY VALUABLE FOR OIL AND GAS:** Known or believed to contain oil and gas deposits that have, or at some time in the future, proven economic value.

**PROTOHISTORY:** The period of time immediately before recorded history.

**PUBLIC DOMAIN LANDS:** Lands that are part of the original public domain and have never left federal ownership and lands in federal ownership that were acquired in exchange for public domain lands or for timber on public domain lands.

**PUBLIC LANDS:** As defined by Public Law 94-579 (Federal Land Policy and Management Act of 1976), lands and interest in land owned by the United States and administered by the

Secretary of the Interior through BLM, regardless of how the United States acquired possession. In common usage, public lands may refer to all federal land no matter what agency manages it. Also see ACQUIRED PUBLIC LANDS.

**QUARTERNARY PERIOD:** The current period of geologic history and second period of the Cenozoic era which is believed to have covered the last two to three million years.

**RANGE IMPROVEMENT:** Any activity or program on or relating to the public lands designed to improve forage production, change vegetation composition, control use patterns, provide water, stabilize soil and water conditions, or provide habitat for livestock and wildlife. Range improvements may be structural or nonstructural. A structural improvement requires placement or construction to facilitate the management or control the distribution and movement of animals. Such improvements may include fences, wells, troughs, reservoirs, pipelines, and cattleguards. Nonstructural improvements consist of practices or treatments that improve resource conditions. Such improvements include seedings; chemical, mechanical, and biological plant control; prescribed burning; water spreaders; pitting; chiseling; and contour furrowing.

**RANGELAND:** A kind of land on which the native vegetation, climax, or natural potential consists predominately of grasses, grasslike plants, forbs, or shrubs. Rangeland includes lands revegetated naturally or artificially to provide a plant cover that is managed like native vegetation. Rangelands may consist of natural grasslands, savannas, shrublands, moist deserts, tundra, alpine communities, coastal marshes, and wet meadows.

## *Glossary*

**RANGELAND ECOLOGICAL SITE:** A distinctive kind of land that has specific physical characteristics and that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation.

**RANGE SITE:** See ECOLOGICAL SITE.

**RANGE SITE GUIDE:** See ECOLOGICAL SITE DESCRIPTIONS.

**RAPTORS:** Birds of prey.

**REACH:** A relatively homogeneous section of a stream having a repetitious sequence of physical characteristics and habitat types.

**RECHARGE:** See AQUIFER RECHARGE.

**RECOGNIZED ENVIRONMENTAL CONDITION:** The presence or likely presence of any hazardous substance or petroleum product on a property under conditions that indicate an existing or past release or a material threat of a release into the ground, groundwater, or surface water.

**RECORD OF DECISION:** A document signed by a responsible official recording a decision that was preceded by the preparing of an environmental impact statement. Also see DECISION RECORD.

**RECREATION OPPORTUNITY SPECTRUM (ROS):** A planning process that provides a framework for defining classes of outdoor recreation environments, activities, and experience opportunities. In ROS, the setting, activities, and opportunities for experiences are arranged along a spectrum of six classes: primitive, semiprimitive nonmotorized, semiprimitive motorized, roaded natural, rural, and urban. The resulting ROS analysis defines specific geographic areas on the ground, each of which encompasses one of the six classes.

**RECREATION ZONE:** A planned and delineated area with designated recreation opportunities, settings, and activities.

**RECRUITMENT:** The increase in population caused by natural reproduction or immigration.

**REFUGIUM:** An area that has remained unaffected by adverse environmental changes to the surrounding area, allowing a population to survive where others have perished.

**REPLACEMENT DEPOSIT:** A mineral deposit formed by a new mineral of partly or wholly differing chemical composition growing in the body of an old mineral or aggregate.

**RESEARCH NATURAL AREA (RNA):** A physical or biological unit in which current natural conditions are maintained insofar as possible. In RNAs, activities such as grazing and vegetation are prohibited unless they replace natural processes and contribute to protecting and preserving an area. Moreover, such recreation as camping and gathering plants is discouraged.

**RESISTANCE TO CONTROL (WILDFIRE):** The relative difficulty of building and holding a fire control line as affected by fire behavior, fuel, topography, and soil.

**RESOURCE ADVISORY COUNCILS (RACs):** Advisory councils appointed by the Secretary of the Interior and consisting of representatives of major public land interest groups (e.g., commodity industries, recreation, environmental, and local area interests) in a state or smaller area. RACs advise the Bureau of Land Management focusing on a full array of multiple use public land issues. RACs also help develop fundamentals for rangeland health and guidelines for livestock grazing.

**RESOURCE CONSERVATION AREA**

**(RCA):** A land management designation that provides management consideration to areas that have special resources but don't need the protection conferred by an area of critical environmental concern. Also see LONG-TERM MANAGEMENT AREAS.

**RESOURCE MANAGEMENT PLAN**

**(RMP):** A BLM planning document that is prepared in accord with Section 202 of the Federal Land Policy and Management Act and that presents systematic guidelines for making resource management decisions for a resource area. An RMP is based on an analysis of an area's resources, their existing management, and their capability for alternative uses. RMPs are issue oriented and developed by an interdisciplinary team with public participation.

**REST:** See GRAZING REST.

**RESTORATION (CULTURAL**

**RESOURCE):** The process of accurately reestablishing the form and details of a property or portion of a property together with its setting, as it appeared in a particular period of time. Restoration may involve removing later work that is not in itself significant and replacing missing original work. Also see STABILIZATION (CULTURAL RESOURCE).

**REST-ROTATION GRAZING:** A grazing system in which one part of the range is ungrazed for an entire grazing year or longer while other parts are grazed for a portion or all of a growing season.

**RHIZOME:** A horizontal underground plant stem that is often thickened by deposits of reserve food material, produces shoots above and roots below, and is distinguished from a true root in having buds, nodes, and usually scalelike leaves.

**RIFFLE:** Shallow rapids where water flows swiftly over completely or partially submerged obstructions to produce surface agitation, but not standing waves.

**RIGHT-OF-WAY:** A permit or easement that authorizes the use of lands for certain specified purposes, commonly for pipelines, roads, telephone lines, or powerlines.

**RIPARIAN:** Pertaining to or situated on or along the bank of streams, lakes, and reservoirs.

**RIPARIAN AREA:** A form of wetland transition between permanently saturated wetlands and upland areas. Riparian areas exhibit vegetation or physical characteristics that reflect the influence of permanent surface or subsurface water. Typical riparian areas include lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels. Excluded are ephemeral streams or washes that lack vegetation and depend on free water in the soil.

**ROAD PRISM:** The area of ground containing a road surface and the cut and fill slopes for the road.

**ROOT ZONE:** The part of the soil that is or can be penetrated by plant roots.

**RUN:** An area of swiftly flowing water that lacks surface agitation or waves and approximates uniform flow, and whose water surface is roughly parallel to the overall gradient of the stream reach.

**RUNOFF:** The portion of a drainage area's precipitation that flows from the area.

## *Glossary*

**SAFE YIELD:** The rate at which water can be withdrawn from a groundwater basin (aquifer) without depleting the supply so as to cause undesirable effects.

**SALABLE MINERALS:** Common variety minerals on public lands, such as sand and gravel, which are used mainly for construction and are disposed of by sales or special permits to local governments.

**SAVANNAH:** A tropical or subtropical grassland containing scattered trees and drought-resistant undergrowth.

**SCOPING:** An early and open process for determining the scope of issues to be addressed in an environmental impact statement and the significant issues related to a proposed action.

**SEASONAL GRAZING:** Grazing restricted to a specific season.

**SECTION:** 640 acres, 1 mile square.

**SECTION 404 PERMIT:** A permit required by the Clean Water Act, under specified circumstances, when dredge or fill material is placed in the waters of the United States, including wetlands.

**SECTION 7 CONSULTATION:** The requirement of Section 7 of the Endangered Species Act that all federal agencies consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service if a proposed action might affect a federally listed species or its critical habitat.

**SEDIMENT:** Solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water. Sediment includes chemical and biochemical precipitates and decomposed organic material such as humus.

**SEDIMENTARY ROCKS:** Rocks, such as sandstone, limestone, and shale, that are formed from sediments or transported fragments deposited in water.

**SEDIMENTATION:** The process or action of depositing sediment.

**SEDIMENT LOAD (SEDIMENT DISCHARGE):** The amount of sediment, measured in dry weight or by volume, that is transported through a stream cross-section in a given time. Sediment load consists of sediment suspended in water and sediment that moves by sliding, rolling, or bounding on or near the streambed.

**SEDIMENT TRANSPORT:** The movement of mineral and organic solid materials in a stream.

**SEDIMENT YIELD:** The amount of sediment removed from a watershed over a specified period, usually expressed as tons, acre-feet, or cubic yards of sediment per unit of drainage area per year.

**SEINING:** Moving a seine (vertically hanging net) through water and bringing the two ends together to catch fish.

**SENSITIVE SPECIES:** All species that are under status review, have small or declining populations, live in unique habitats, or need special management. Sensitive species include threatened, endangered, and proposed species as classified by the U.S. Fish and Wildlife Service.

**SHARED USE TRAIL:** A trail shared for a variety of uses such as motorized and nonmotorized uses; a combination of nonmotorized uses such as hiking, horseback riding, and bicycling; or a combination of motorized uses such as dirt bikes and small and large four-wheel vehicles.

**SHIPPING PASTURE:** A small pasture in which livestock are kept for up to a week before being shipped out. Shipping pastures are preferred to corrals because of the large amount of dust that concentrated livestock can stir up in a corral.

**SHOW:** See OIL AND GAS SHOW.

**SHRINK-SWELL POTENTIAL:** The susceptibility of soil to volume change due to loss or gain in moisture content.

**SIKES ACT OF 1974:** A federal law that promoted federal-state cooperation in managing wildlife habitats on both BLM and Forest Service lands. The act required BLM to work with state wildlife agencies to plan the development and maintenance of wildlife habitats and had as its main tool the habitat management plan.

**SMOKE PERMIT:** In Arizona, a permit that an agency must obtain from the Arizona Department of Environmental Quality in order to conduct a prescribed burn. Also see PRESCRIBED FIRE.

**SOCIAL TRAIL:** An unplanned random trail made by first visitors and then followed by others.

**SOIL MOISTURE:** The water content stored in a soil.

**SOIL PIPING:** The removal of soil material through subsurface flow channels or “pipes” formed by seepage water.

**SOIL PRODUCTIVITY:** The capacity of a soil in its normal environment to produce a specified plant or sequence of plants under a specified system of management.

**SOIL STABILITY:** A qualitative term used to describe a soil’s resistance to change. Soil stability is determined by intrinsic properties such as aspect, depth, elevation, organic matter content, parent material, slope, structure, texture, and vegetation.

**SOIL STRUCTURE:** The physical constitution of soil material as expressed by size, shape, and the degree of development of primary soil particles and voids into naturally or artificially formed structural units.

#### **SONOITA VALLEY PLANNING**

**PARTNERSHIP (SVPP):** A partnership of people from federal, state, and local agencies and other interests that was formed in 1995 to work with the community on public land issues in an area of southeast Arizona, defined roughly as the Cienega Creek watershed south of Interstate 10 and small portions of the upper watersheds of Sonoita Creek and the Babocomari River. The partnership, open to anyone wishing to participate, is an outgrowth of BLM’s attempt to involve more public participation in planning for the area and to improve communication and coordination with surrounding public and private landowners.

**SPECIAL LAND USE PERMIT (SLUP):** A permit granted for purposes neither authorized nor forbidden by law.

**SPECIAL RECREATION PERMIT (SRP):** An authorization that allows for specific nonexclusive permitted recreational uses of the public lands and related waters. SRPs are issued to control visitor use, protect recreational and natural resources, provide for the health and safety of visitors, and accommodate commercial recreational uses.



## *Glossary*

**SPECIAL STATUS SPECIES:** Plant or animal species listed as threatened, endangered, candidate, or sensitive by the Federal government or state governments.

**SPLIT-ESTATE:** Land whose surface rights and mineral rights are owned by different entities. Such a condition commonly occurs when surface rights are owned by the Federal government and the mineral rights are privately or state owned.

**STABILIZATION (CULTURAL RESOURCE):** Protective techniques usually applied to structures and ruins to keep them in their existing condition, prevent further deterioration, and provide structural safety without significant rebuilding. Capping mud-mortared masonry walls with concrete mortar is an example of a stabilization technique. Also see RESTORATION (CULTURAL RESOURCE).

**STABILIZATION (SOIL):** Chemical or mechanical treatment to increase or maintain the stability of a mass of soil or otherwise improve its engineering properties.

**STANDARDS AND GUIDELINES FOR RANGELAND HEALTH:** See ARIZONA STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING ADMINISTRATION.

**STAGING AREA:** An area where participants in an activity gather and make final preparations for the activity.

**STAMP:** A machine for crushing ore, used particularly in gold milling.

**STATE HISTORIC PRESERVATION OFFICER (SHPO):** The official within and authorized by each state at the request of the

Secretary of the Interior to act as liaison for the National Historic Preservation Act. Also see NATIONAL HISTORIC PRESERVATION ACT.

**STATE LANDS:** See STATE TRUST LANDS.

**STATE TRUST LANDS:** Lands granted to Arizona by the Federal government at territorial establishment and at statehood. Totaling 9.4 million acres, these lands are managed by the Arizona State Land Department to yield revenue over the long-term for the 14 trust beneficiaries. The chief beneficiary consists of the public schools. Whenever Arizona sells or leases these lands and their natural resources, it must pay the beneficiaries. Revenues from land sales are maintained in a permanent fund managed by the State Treasurer and interest from this fund is paid to the beneficiaries.

**STOCKING RATE:** The number of specific kinds and classes of animals grazing or using a unit of land for a specific time period. Stocking rates may be expressed as a ratio, such as of animal units/section, acres/animal unit, or acres/animal unit month. Also see CONSERVATIVE STOCKING RATE and FIXED STOCKING RATE.

**STOCK TANK (POND):** A water impoundment created by building a dam, digging a depression, or both, to provide water for livestock or wildlife.

**STREAMBANK:** The portion of a stream channel that restricts the sideward movement of water at normal water levels. The streambank's gradient often exceeds 45° and exhibits a distinct break in slope from the stream bottom.

**STREAMBANK STABILITY:** A streambank's relative resistance to erosion which is measured as a percentage of alteration to streambanks.

**SUBECONOMIC:** Lacking economic importance; not justifiable solely on economic grounds.

**SUBIRRIGATED SOILS:** Streamside soils into whose root zone the water table rises.

**SUBMERGENT VEGETATION:** Aquatic plants that grow only within water and do not break the water's surface. Also see EMERGENT VEGETATION.

**SUBSTRATE:** (1) Mineral and organic material forming the bottom of a waterway or water body; (2) The base or substance upon which an organism is growing.

**SUBWATERSHED:** A watershed subdivision of unspecified size that forms a convenient natural unit.

**SUCCESSION:** See PLANT SUCCESSION.

**SUCCULENTS:** Plants such as cacti that have fleshy tissues designed to conserve moisture.

**SUPPLEMENTAL FEED:** Concentrates or harvested feed that is fed to livestock to correct the deficiencies of a range diet.

**SURFACE OCCUPANCY:** See NO SURFACE OCCUPANCY.

**SUSTAINED YIELD:** Achieving and maintaining a permanently high level, annual or regular period production of renewable land resources without impairing the productivity of the land and its environmental values.

**SWALE:** A commonly wet or moist low-lying or depressed land area.

**TAILINGS:** The waste matter from ore after the extraction of economically recoverable metals and minerals.

**TAKE:** As defined by the Endangered Species Act, "to harass, harm, pursue, hunt, shoot, wound, kill, capture, or collect, or attempt to engage in any such conduct."

**TARGET SPECIES:** Plant species to be reduced or eliminated by a vegetation treatment. Also see VEGETATION TREATMENTS.

**TERRESTRIAL SPECIES:** Ground-dwelling plants and animals.

**TERTIARY PERIOD:** The earlier (65 million to 1.8 million years ago) of the two geologic periods in the Cenozoic era of geologic time.

**THREATENED SPECIES:** Any plant or animal species likely to become endangered within the foreseeable future throughout all or a part of its range and designated by the U.S. Fish and Wildlife Service under the Endangered Species Act. Also see ENDANGERED SPECIES.

**TRAILHEAD:** The terminus of a hiking, horse, or bicycle trail accessible by motor vehicle and sometimes having parking, signs, a visitor register, and camping and sanitary facilities.

**TRANSITIONAL PATHWAYS:** The processes that cause a shift from one vegetation state to another.

**TRAVERTINE:** A mineral consisting of calcium carbonate deposited by spring waters.

**TREAD LIGHTLY:** A not-for-profit organization whose mission is to increase awareness of ways to enjoy the great outdoors while minimizing human impacts.

## *Glossary*

**TUCSON ACTIVE MANAGEMENT AREA (AMA):** One of five such active management areas in Arizona established under the 1980 Groundwater Management Code. Covering 3,866 mi<sup>2</sup> in southeast Arizona, this AMA includes portions of Pima, Pinal, and Santa Cruz counties and five incorporated cities and towns: Tucson, South Tucson, Oro Valley, Marana, and Sahuarita. Also within the AMA are the Pasqua Yaqui tribal lands and part of the Schuk Toak District and the entire San Xavier District of the Tohono O'odham Nation. The Tucson AMA has a statutory goal of achieving safe yield (groundwater pumped from the aquifer not exceeding aquifer recharge) by the year 2025. Also see ACTIVE MANAGEMENT AREA.

**TURBIDITY:** Cloudiness of water measured by how deeply light can penetrate it from the surface. Highly turbid water is often called “muddy” although all kinds of suspended particles contribute to turbidity.

**UNAUTHORIZED USE:** Any use of the public lands not authorized or permitted.

**UNDERSTORY:** Plants growing under the canopy of other plants. Understory usually refers to grasses, forbs, and low shrubs under a tree or brush canopy. Also see OVERSTORY.

**USEABLE FORAGE:** That portion of the forage that can be grazed without damage to the basic resources; may vary with season of use, species, and associated species.

**UNGULATES:** Hoofed animals including ruminants but also horses, tapirs, elephants, rhinoceroses, and swine.

**UNIQUE FARMLAND:** As defined by the Farmland Protection Policy Act of 1981, land other than prime farmland that is used for producing specific high-value food and fiber crops, as determined by the Secretary of

Agriculture. Unique farmland has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables. Also see PRIME FARMLAND.

**UNIQUE WATER:** A water body determined by the Arizona Department of Environmental Quality as an outstanding water resource of the state because of exceptional recreational or ecological significance, such as important geology, flora, fauna, water quality, aesthetic values, or wilderness characteristics.

**UPLANDS:** Lands at higher elevations than the alluvial plain or low stream terrace; all lands outside the riparian-wetland and aquatic zones.

**URBAN INTERFACE (WILDLAND-URBAN INTERFACE):** The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. This interface creates conflicts and complicates fighting wildfires and conducting prescribed burns.

**UTILIZATION (FORAGE):** The proportion of the current year's forage consumed or destroyed by grazing animals. Utilization is usually expressed as a percentage.

**VALID EXISTING RIGHTS:** Locatable mineral development rights that existed when the Federal Land Policy and Management Act (FLPMA) was enacted on October 21, 1976. Some areas are segregated from entry and location under the Mining Law to protect certain values or allow certain uses. Mining claims that existed as of the effective date of the segregation may still be valid if they can meet the test of discovery of a valuable mineral

required under the Mining Law. Determining the validity of mining claims located on segregated lands requires BLM to conduct a valid existing rights determination.

**VANDALISM (CULTURAL RESOURCE):**

The unauthorized collecting, excavating, or defacing of cultural resources.

**VARIABLE STOCKING:** The practice of varying the stocking rate through the plant growing season with the objective of using forage at a rate similar to its growth rate. The stocking rate can be varied either by varying the number of animals in a set area or varying the acreage offered to a set number of animals. Also see STOCKING RATE and FIXED STOCKING RATE.

**VASCULAR PLANT:** A plant in the phylum Tracheophyta, which includes spermatophytes (seed plants) and pteridophytes (ferns and related plants).

**VEGETATION STATES:** The different plant communities produced by an ecological site.

**VEGETATION STRUCTURE:** The composition of an area's vegetation--plant species, growth forms, abundance, vegetation types, and spatial arrangement.

**VEGETATION TREATMENTS:** Treatments that improve vegetation condition or production. Such treatments may include seedings; prescribed burning; or chemical, mechanical, and biological plant control.

**VEGETATION TYPE:** A plant community with distinguishable characteristics.

**VIABILITY:** The capability of living, developing, growing, or germinating under favorable conditions.

**VIEWSHED:** The entire area visible from a viewpoint.

**VISITOR DAY:** 12 visitor hours which may be aggregated continuously, intermittently, or simultaneously by one or more people.

**VISUAL ASPECT:** The visual first impression of vegetation at a particular time or seen from a specific point.

**VISUAL RESOURCE MANAGEMENT (VRM):** The planning, design, and implementing of management objectives to provide acceptable levels of visual impacts for all BLM resource management activities.

**VISUAL RESOURCE MANAGEMENT (VRM) CLASSES:** Classes with specific objectives for maintaining or enhancing scenic quality including the kinds landscape modifications that are acceptable to meet the objectives.

**Class I:** (Preservation) provides for natural, ecological changes only. This class includes wilderness areas, some natural areas, some wild and scenic rivers, and other similar sites where landscape modification should be restricted.

**Class II:** (Retention of the landscape character) includes areas where changes in any of the basic elements (form, line, color, or texture) caused by management activities should not be evident in the characteristic landscape.

**Class III:** (Partial retention of the landscape character) includes areas where changes in the basic elements caused by management activities may be evident in the characteristic landscape. But the changes should remain subordinate to the existing landscape character.

## Glossary

**Class IV:** (Modification of the landscape character) includes areas where changes may subordinate the original composition and character. But the changes should reflect what could be a natural occurrence in the characteristic landscape.

**WARM-SEASON PLANTS:** Plants whose major growth occurs during the spring, summer, or fall and that are usually dormant in winter. Also see COOL-SEASON PLANTS.

**WATER BAR:** A low ridge of dirt, rock, or other material placed across a trail or dirt road on a hill to divert flowing water and protect the trail or road from erosion.

**WATERSHED (CATCHMENT):** A topographically delineated area that is drained by a stream system, that is, the total land area above some point on a stream or river that drains water past that point. The watershed is a hydrologic unit often used as a physical-biological unit and a socioeconomic-political unit for planning and managing natural resources. Because this plan does not cover the entire watershed for Cienega Creek, the term is used for that portion under BLM management.

**WATERSHED CONDITION (WATERSHED HEALTH):** The comparison of watershed processes to normal or expected measurements of properties such as soil cover, erosion rate, runoff rate, and groundwater table elevation; an assessment or categorization of an area by erosion conditions, erosion hazards, and the soil moisture/temperature regime.

**WATERSHED FUNCTION:** The combination of processes attributed to watersheds as part of the hydrologic cycle including interception of rain by plants, rocks, and litter; surface storage by the soil; groundwater storage; stream channel storage; soil evaporation; plant transpiration; and runoff. These processes affect the

following properties of the watershed: runoff rate, water infiltration rate, soil building rate, soil erosion rate, groundwater recharge rate, groundwater discharge rate, water table elevation, and surface water discharge. These properties in turn affect plant communities through soil attributes, including soil parent material, soil moisture, and nutrients; stream and rivers through flooding duration and magnitude, as well as sediment load, which structures the dimension, pattern, and profile of channels; and lakes and reservoirs through sedimentation and nutrient input.

**WEED:** Any plant that interferes with management objectives. A weed may be native or non-native, invasive or passive, or non-noxious.

**WEED MANAGEMENT AREAS (WMAs):** Partnerships of public land managers and private land owners formed to support and coordinate the attacking of noxious weeds in a watershed or general infestation area.

**WETLAND:** An area that is inundated or saturated by surface or ground water often and long enough to support and that under normal circumstances supports a prevalence of vegetation typically adapted for life in saturated soil. Wetlands include marshes, shallows, swamps, lake shores, bogs, muskegs, wet meadows, estuaries, cienegas, and riparian areas.

**WILDCAT ROAD:** A non-permitted road on federally managed land.

**WILDFIRE:** Any wildland fire that is not meeting management objectives and therefore requires a suppression response.

**WILDLIFE:** A broad term that includes birds, reptiles, amphibians, and non-domesticated mammals.

**WING FENCE:** Fencing extending out from a corral and serving to help funnel livestock into the corral.

**WITHDRAWAL:** See MINERAL WITHDRAWAL.

**WULFENITE (YELLOW LEAD ORE):** A mineral ( $\text{PbMoO}_4$ ) sometimes with calcium, chromium, or vanadium; an ore of molybdenum.

**XERO-RIPARIAN:** ~~A streamside area~~ **An area in a drainage** that supports plant species more characteristic of uplands than wetlands, but that is more densely vegetated than areas removed from the **drainage stream course**. **Any** flows in these channels are characteristically ephemeral **but water may also be subsurface and the drainage may not flow.**

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# ABBREVIATIONS

**ACEC:** Area of critical environmental concern

**ADEQ:** Arizona Department of Environmental Quality

**ADES:** Arizona Department of Economic Security

**ADWR:** Arizona Department of Water Resources

**AGFD:** Arizona Game and Fish Department

**AMA:** Active management area

**AMP:** Allotment management plan

**ARS:** Agricultural Research Service

**ASLD:** Arizona State Land Department

**AUM:** Animal unit month

**BLM:** Bureau of Land Management  
(U.S. Department of the Interior)

**cfs:** Cubic feet per second

**CRPP:** Cultural resource project plan

**CYL:** Cattle year-long

**HMP:** Habitat management plan

**LTMA:** Long-term management area

**MLRA:** Major land resource area

**NCA:** National Conservation Area

**NRCS:** Natural Resources Conservation Service  
(U.S. Department of Agriculture)

**OHV:** Off-highway vehicle

**PFC:** Proper functioning condition

**PNC:** Potential natural community

**RAC:** Resource advisory council

**RACE:** Riparian Area Condition Evaluation

**RAWS:** Remote Automated Weather Station

**RMP:** Resource management plan

**RRT:** Rangeland resource team

**SRP:** Special recreation permit

**T&E:** Threatened and endangered

**UA:** University of Arizona

**USGS:** United States Geological Survey

**USFS:** United States Forest Service

**VRM:** Visual resource management

**WMA:** Weed management area

**WSR:** Wild and scenic river