UPPER GILA - SAN SIMON GRAZING ENVIRONMENTAL STATEMENT FINAL

Prepared by
United States
Department of the Interior
Bureau of Land Management
Arizona

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
ARIZONA STATE OFFICE
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IN REPLY REFER TO

Enclosed is the Final Environmental Statement of the proposed Upper Gila-San Simon Grazing Management Program, located within the BLM Safford District in southeastern Arizona and extending into New Mexico.

The Safford District of the Bureau of Land Management prepared the environmental statement pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969. The document describes and analyzes impacts which would result from a proposed grazing management plan, along with four alternatives to that plan.

Thank you for your interest in this Environmental Statement.

Sincerely,

State Director

DEPARTMENT OF THE INTERIOR

FINAL

ENVIRONMENTAL STATEMENT

UPPER GILA - SAN SIMON

PREPARED BY

BUREAU OF LAND MANAGEMENT

DEPARTMENT OF THE INTERIOR

Gerald E. Petty
ACTING DIRECTOR

COVER: The satellite image on the cover shows a portion of the area under consideration in this document. This area was imaged during June 1976. The Safford Valley agricultural area is the mottled area on the right center. The Gila River crosses the center of the image.

SUMMARY

( ) Draft (X) Final Environmental Statement

Department of the Interior, Bureau of Land Management

1. Type of Action: (X) Administrative ( ) Legislative

2. Brief Description of Action: The proposed action of this Environmental Statement (ES) involves a livestock grazing management program within the Upper Gila-San Simon Livestock Grazing ES area on 1,346,709 acres of public lands. The ES area lies in southeastern Arizona within the BLM Safford District, a portion of which extends into New Mexico.

The proposed action includes the following components:

1. Intensive management of grazing on 1,040,329 acres of public lands.
2. Custodial management of grazing on 38,161 acres of public lands.
3. Ephemeral management of grazing on 250,155 acres of public lands.
4. Deferment of grazing on 14,050 acres of public lands.
5. Unallotted for grazing: 4,014 acres of public lands.
6. Construction of range improvements to facilitate grazing management.
7. Construction of three detention dams for erosion control, sediment retention, and range improvement.

3. Summary of Environmental Impacts

Beneficial Impacts: Watershed conditions would improve overall. The production of desirable vegetation would increase as would total vegetation ground cover. Wildlife habitat would improve and the numbers of big-game and nongame animals would increase. Water quality would improve in surface streams, and sediment yield would decrease. Overall range-related income would increase.

Adverse Impacts: Proposed range improvements would slightly reduce the visual quality of the area. Disturbance to archaeological and historical remains by range improvements, cattle trampling, erosion, and other actions would be slight but long term and irretrievable. Range-related income would decrease on some grazing units as would ranch values and assessed valuation.

4. Alternatives Considered:

1. No action.
2. Elimination of grazing on public lands.
3. Limited management.
4. Reduction of grazing to 50 percent of grazing capacity.

5. Comments will be requested from:
(See chapter 9.)

6. Date Draft Statement Made Available to EPA and to the Public;
Draft Statement: April 1978
Final Statement: September 1978

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CHAPTER 1

DESCRIPTION OF THE PROPOSAL

CHAPTER 1

DESCRIPTION OF THE PROPOSAL

PROPOSED ACTION

The Bureau of Land Management (BLM) proposes to implement a livestock grazing management program based on multiple-use concepts, within the Upper Gila-San Simon Livestock Grazing area (ES area) shown on map 1-1 and plate 1. The ES area is divided into four planning units, shown on map 1-2. This area includes all the land in the Safford Grazing District as established in 1936, land in the Las Cruces, New Mexico District being administered by the Safford District under agreement, and some lands administered under Section 15 of the Taylor Grazing Act (Section 15 lands) in the Winkelman area. The Safford District also administers isolated parcels of Section 15 lands, most of which are in Cochise County but not within the grazing district or the ES area.

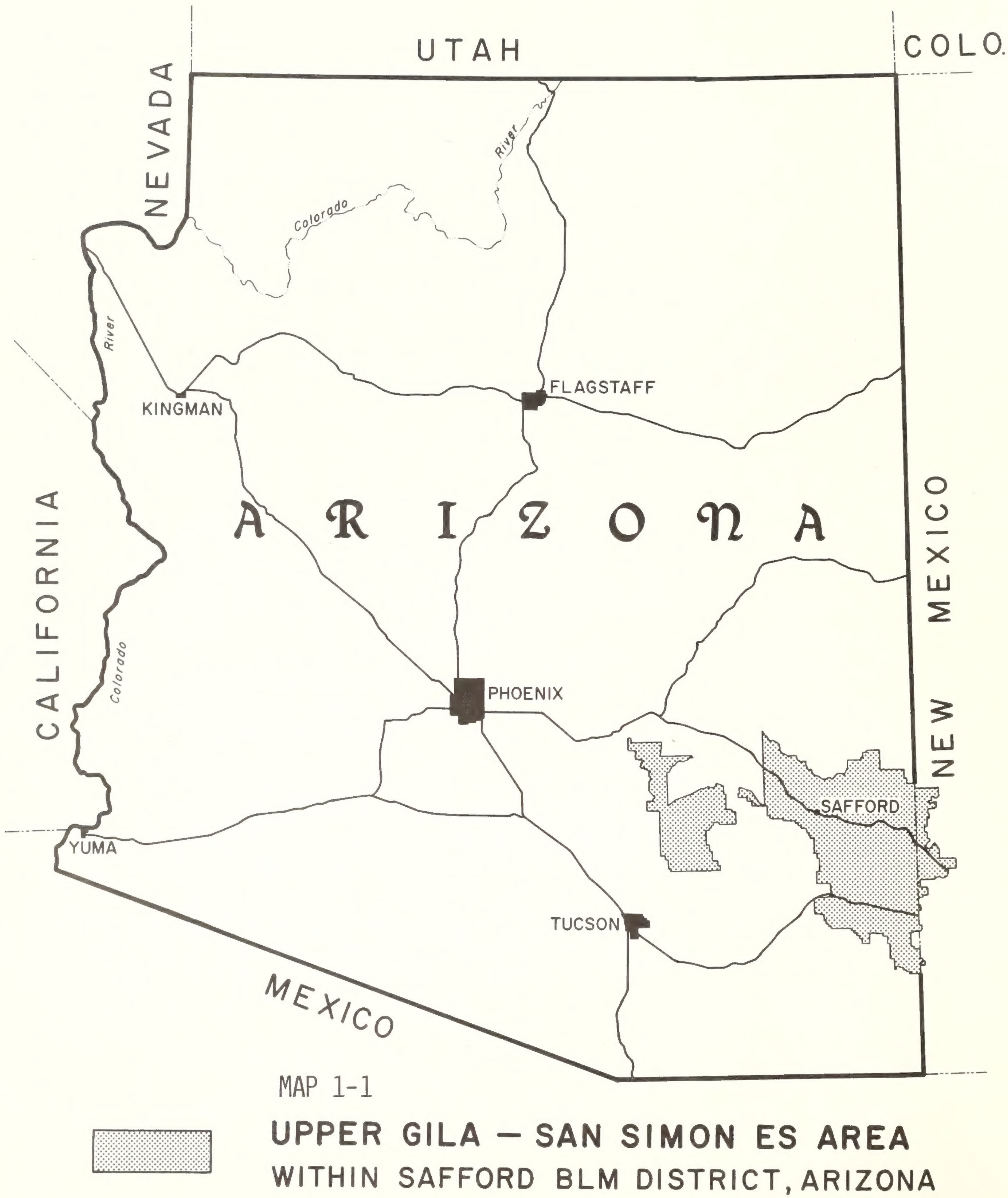
The ES area lies in southeastern Arizona within the BLM Safford District, a portion of which (185,379 acres) extends into New Mexico. The proposed action involves public lands administered by BLM, a national historic site, State lands, and privately owned lands in the following amounts:

Public Lands (administered by BLM)	1,345,739 acres
Other Federal Lands	970
State Lands	696,631
Private Lands	302,722
Total	2,346,062

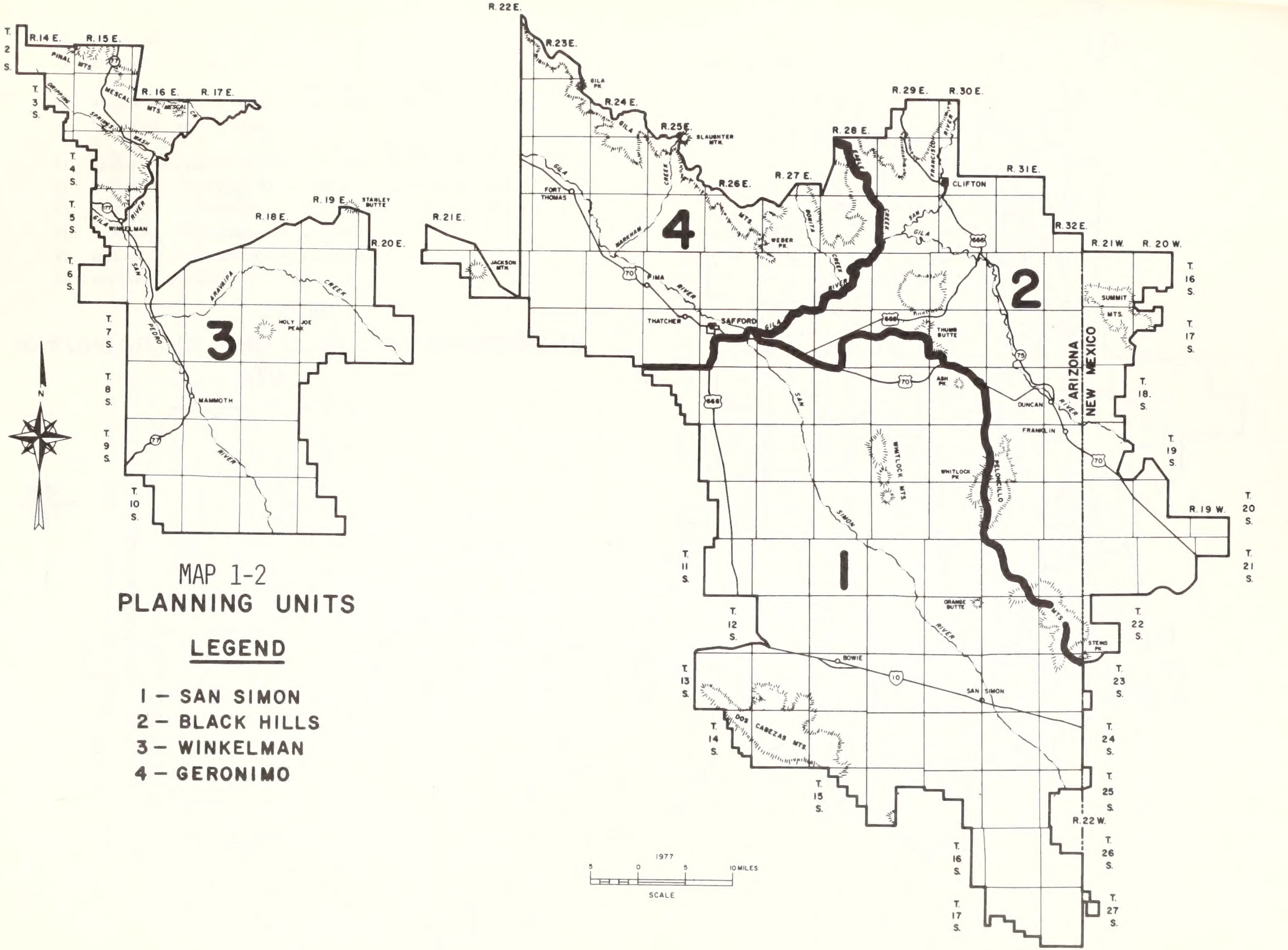
The four planning units of the ES area contain an additional 2,972 acres of public lands, 205,440 acres of State lands, and 250,238 acres of private lands not included in the proposed action.

Areas outside BLM grazing units and not involved in the proposed action are shown in map 1-3. These areas include large blocks of private and State lands not grazed in conjunction with public lands. Thus, the ES area contains 2,804,712 acres, of which 2,346,062 acres are involved in the proposed action.

The proposed action would be implemented on 193 specific land areas called "grazing units" and shown on map 1-3. Each grazing unit includes public lands, and in most cases, State and private lands. In some cases, the grazing units would be formed by combining existing grazing areas (allotments). The 193 grazing units would be formed from 223 existing allotments.


UTAH
COLO.
NEVADA
CALIFORNIA
NEW MEXICO
MEXICO
ARIZONA
Colorado River
River
Colorado
FLAGSTAFF
KINGMAN
PHOENIX
SAFFORD
YUMA
TUCSON
UPPER GILA — SAN SIMON ES AREA
WITHIN SAFFORD BLM DISTRICT, ARIZONA

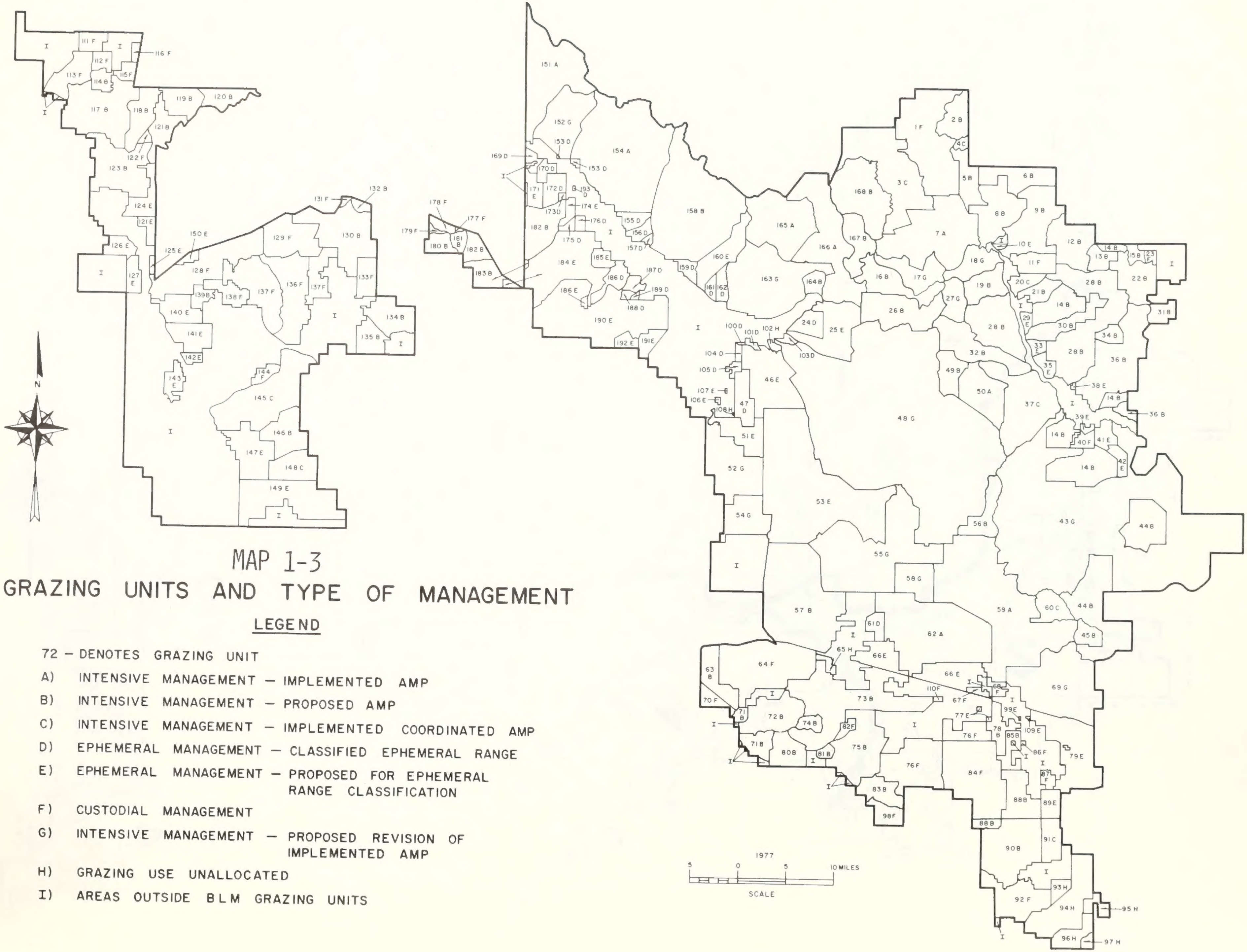
MAP 1-1



MAP 1-2
PLANNING UNITS

LEGEND

1 – SAN SIMON
2 – BLACK HILLS
3 – WINKELMAN
4 – GERONIMO



MAP 1-3
GRAZING UNITS AND TYPE OF MANAGEMENT

LEGEND

72 — DENOTES GRAZING UNIT

A) INTENSIVE MANAGEMENT — IMPLEMENTED AMP

B) INTENSIVE MANAGEMENT — PROPOSED AMP

C) INTENSIVE MANAGEMENT — IMPLEMENTED COORDINATED AMP

D) EPHEMERAL MANAGEMENT — CLASSIFIED EPHEMERAL RANGE

E) EPHEMERAL MANAGEMENT — PROPOSED FOR EPHEMERAL RANGE CLASSIFICATION

F) CUSTODIAL MANAGEMENT

G) INTENSIVE MANAGEMENT — PROPOSED REVISION OF IMPLEMENTED AMP

H) GRAZING USE UNALLOCATED

I) AREAS OUTSIDE BLM GRAZING UNITS

Grazing capacities (carrying capacities) for the grazing units of the ES area were determined by the ocular reconnaissance range survey method and ocular estimates (appendix A). The ocular reconnaissance range surveys conducted from 1963 through 1976 and available for 31 percent (716,193 acres) of the area are shown in table 1-1.

The grazing capacities for areas without range surveys were estimated by using grazing capacities of comparable areas on which range surveys had been made. Field checks show at least a 90 percent confidence level of these estimates when compared to the occular reconnaissance survey method. In addition, estimated grazing capacities were adjusted on the basis of observations of the general condition and vigor of the range, steepness and roughness of terrain, and the range's accessibility to livestock. Grazing capacities are expressed in animal unit months (AUMs), the amount of forage required by one mature cow for 1 month.

TABLE 1-1
RANGE RESURVEYS* USING OCULAR RECONNAISSANCE

Calendar Year	Acres
1963	43,194
1964	186,290
1965	28,011
1966	198,218
1968	55,059
1973	18,170
1974	113,540
1975	70,791
1976	2,920
Total	716,193

*Original survey made in 1936

Range surveys or estimates of grazing capacities are designed to determine the amount of forage available to livestock and wildlife under proper range use. Management studies from the Santa Rita Experimental Range indicate that proper stocking is the average number of cattle required to consume 40 percent of the perennial forage production (Martin, 1973). Proper stocking thus leaves 60 percent of the forage for watershed protection and other nonconsumptive uses. Depending on the degree of slope, 60 to 100 percent of the vegetation produced on steep slopes would be left for watershed protection and other nonconsumptive uses.

The proposed action calls for the allocation of 2,128 AUMs (2 percent) of forage for wildlife on the basis of present wildlife population data supplied by the Arizona Game and Fish Department (AG&FD) (1976c).

For increases in AUMs expected to result from implementation of the proposed action, forage would be allocated to wildlife up to the AG&FD optimum levels before increases in livestock use are allowed. Meeting anticipated needs of the optimum number of wildlife expected under the proposed action would require approximately doubling the present wildlife forage allocations.

Appendix B shows the following information for each grazing unit within the ES area:

1. Grazing capacity.
2. Present amount of licensed livestock use (1972-76 average).
3. The portion of the grazing capacity allocated for wildlife.
4. The proposed amount of reduction, if any, in licensed livestock use.

Appendix B does not, however, include the total grazing capacity of the ES area, because the amount of forage available in future years from units proposed for ephemeral management cannot be predicted. Ephemeral management is discussed later in this chapter.

When the present licensed livestock use exceeds the grazing capacity for a grazing unit, the licensed livestock use would be reduced to balance with the grazing capacity. Where the grazing licensee is agreeable, the estimated grazing capacity would be used as the initial stocking rate. Subsequent adjustments in the stocking rate, if needed, would be based on long-term studies (3-5 years) as outlined in BLM Manual 4400.

In cases where a range survey has not been conducted and BLM and the allottee cannot agree on the initial stocking rate, grazing capacity would be determined using BLM range survey techniques. All adjustments in licensed livestock use would comply with Title 43, Code of Federal Regulations (CFR).

Objectives

The general objective of the proposed action is to permit livestock to utilize a harvestable surplus of palatable vegetation--a renewable resource--and thereby produce a usable food product. The proposed livestock management program is based on the multiple-use resource management concept, which provides for the demands of various resource uses and minimizes the conflicts among those uses or activities. Although the various uses of the rangeland resource can be compatible, competition among uses requires constraints and mitigating measures to realize multiple-use resource management goals. The specific objectives for each grazing unit are shown in appendix C.

Specific Components of the Proposal

The proposed action includes the following components:

- Intensive management of grazing.
- Custodial management of grazing.
- Ephemeral management of grazing.
- Deferment of livestock grazing.
- Management of lands unallocated for grazing.
- Construction of range improvements to facilitate grazing management.
- Construction of three detention dams for erosion control and sediment retention.

Map 1-3 shows the boundaries of each grazing unit and the type of management proposed for the various units.

Table 1-2 shows the number of grazing units and the amount of land proposed for each type of management.

TABLE 1-2
GRAZING UNITS AND ACREAGE OF LAND
PROPOSED FOR EACH GRAZING MANAGEMENT SYSTEM

Proposed Management System	Number of Grazing Units	Public Lands and Other Federal	Acres Private	Acres State	Total
Intensive	87	1,040,329	179,431	453,547	1,673,307
Custodial	33	38,161	64,964	152,897	256,022
Ephemeral	65	250,155	39,097	77,817	367,069
Deferment	0*	14,050	1,000	550	15,600
Unallocated	8	4,014	18,230	11,820	34,064
Grazing Unit Totals	193	1,346,709	302,722	696,631	2,346,062
Lands not included within grazing unit boundaries		2,972	250,238	205,440	458,650
ES TOTAL		1,349,681	552,960	902,071	2,804,712

*Deferment of livestock use is proposed for only portions of nine grazing units.

When licensed livestock use has been adjusted, the proposed system of grazing management for a unit would be implemented. When BLM and the grazing licensee reach an agreement, the management system would be implemented cooperatively. When BLM and the licensee cannot agree upon a proposed system of grazing management, the management system would be implemented by District Manager's decision. All grazing management systems would be implemented in accordance with Title 43, CFR.

In many cases the construction of range improvements such as fences and water facilities would be necessary to put into practice the proposed management systems. All necessary planned range improvements would be completed before the management system would be put into practice. Once a management system is put into practice, the licensee would be required to adhere to stipulations of the system. Deviation from the management system could be allowed for circumstances beyond the licensee's control, such as severe drought, but such deviation would require the District Manager's prior authorization.

Range studies would be established in appropriate locations within each pasture, and BLM personnel would annually collect data and inventory and evaluate the renewable resources to determine the effects of the implemented management system. The District would evaluate the management system annually in consultation with the licensee involved. Evaluations and long-term (3-5 years) studies would identify the need for major changes in a given management system. Studies would include range conditions, utilization, actual livestock use, and range trend, as outlined in BLM Manual 4400. Wildlife studies are manditory if the wildlife objectives of the Allotment Management Plans (AMPs) are to be met. Studies involving hydrology, cultural and visual resources, and other factors might also be included where appropriate to the resource values of a grazing unit.

Intensive Grazing Management

Intensive grazing management is proposed for 87 of the 193 grazing units and would involve 1,040,329 acres of public lands and 632,978 acres of private and State lands. The status of the 87 AMPs is as follows:

		ACRES OF LAND	
STATUS OF AMP	Number	Public	Private and State
Proposed for implementation	71	756,985	513,854
Implemented at present; proposed for continuation	16	283,344	119,124
TOTAL	87	1,040,329	632,978

The 16 AMPs proposed for continuation have been in effect for periods up to 8 years. Eight of the 87 proposed AMPs were developed in cooperation with the U.S. Forest Service and Soil Conservation Service. Such plans are called "coordinated AMPs."

Intensive grazing management would be implemented through the BLM's AMP program. An AMP is a livestock grazing management plan dealing with a specific unit of rangeland, based on multiple-use resource management objectives. Objectives included in the proposed AMPs are listed in appendix C. An AMP establishes the seasons of use, the number of livestock permitted on the range, and the range improvements needed.

AMPs are proposed for all grazing units containing parcels of public land considered to be large enough or to have sufficient resource values to warrant increased management efforts. In general, AMPs are proposed for units with greater than 20 percent of the land area composed of public lands. In addition, most parcels of public lands larger than 640 acres are included in AMPs. All parcels of public lands under grazing programs and with significant resource values are included in AMPs.

The general objective of all AMPs is to direct the use of the range to sustain livestock production consistent with the long-range productivity of the renewable resources. AMPs are aimed toward optimizing soil cover while sustaining or increasing production of vegetation desirable for livestock and wildlife forage and cover. AMPs develop methods of grazing in accordance with the physiological requirements of the vegetation in species that produce and maintain the renewable resources on public lands. The principal tool used in AMPs for managing vegetation is livestock grazing. Each AMP includes evaluation procedures. Once implemented, an AMP is evaluated at least every 5 years through various study procedures.

AMPs are revised if the evaluation procedures determine that the objectives established for the grazing units are not being achieved. Such revisions may include changes in the grazing system, amount of licensed livestock use, seasons of use, or any combination of these. All AMPs are subject to change at any time a deterioration in the renewable resources of a grazing unit is apparent.

Each proposed AMP is based on the proper stocking rate for the rangelands involved. Proper stocking is an essential principle of range management, which should precede or coincide with the initiation of any grazing management system. With stocking rates in balance with the proposed grazing capacities, utilization of key forage species in the key areas would average about 40 percent over a period of years. At a given stocking rate during years of high forage production (e.g. above normal rainfall) utilization in the use pasture might be as low as 20 percent. During years of low forage production utilization could be as high as 60 percent.

The key forage plant method of measuring utilization would be used to monitor grazing intensity and to help determine (along with range and habitat condition and trend) whether adjustments in stocking are needed. This method uses an ocular estimate of the degree to which selected forage plants (key species) have been grazed or browsed and five utilization classes to designate relative degree of use. (BLM Manual 4412.22B7c and 6630 describe these methods in detail.)

BLM range and wildlife personnel would measure average utilization of the suitable range in the "graze pasture" by or near the end of each grazing period. Records would be submitted to BLM at the end of each grazing period. These records would show livestock numbers and dates for each grazing unit or pasture designated in the grazing schedule. District staff members would periodically check to assure that the correct stocking levels are maintained.

Trend is the change in vegetation and soil characteristics directly resulting from environmental factors, primarily precipitation and grazing. Range managers would establish permanent trend plots in key areas using standard procedures prescribed in BLM Manual 4412.22C. They would then take general and overhead photos each year, to be used to observe changes in ground cover, plant vigor, and species composition. The BLM Manual provides that the trend plots be "read" at or near the end of the grazing use period.

Decisions affecting future stocking levels would consider the trend in range condition in relation to the estimated carrying capacity, climate conditions, and results of utilization studies.

In addition to the manual procedures for range and habitat trend studies, permanent 100-foot transects would be established at each study location to monitor changes in plant density and species composition. The permanent 100-foot transects would normally be "read" at the same time as the trend plots.

The 87 AMPs involved in the proposed action include five different systems of intensive grazing management:

SYSTEM	ACRES OF LAND: Public	ACRES OF LAND: Private and State
Rest Rotation	334,142	111,720
Santa Rita 3-Pasture Rotation	279,575	197,261
Deferred Rotation	89,973	57,275
Seasonal	98,732	77,418
Yearlong	237,907	189,304
TOTAL	1,040,329	632,978

An AMP may include more than one of the above systems of grazing.

General Criteria Considered in Selection of Intensive Grazing Systems. BLM resource specialists (range conservationists, wildlife biologists, and watershed specialists) selected the type of grazing system to meet the needs of the various resources for the 87 AMPs. They considered the following major criteria in their selection:

1. Grazing unit size and shape.
2. Physiographic characteristics.
3. Vegetation factors--present condition, production, present use, composition, physiological requirements, and estimated potential for improvement.
4. Resource constraints identified in land use planning.
5. Resource management objectives--wildlife, watershed, soil, and recreation.
6. Desired vegetation condition--composition, production, and degree of use.
7. Sequence and timing of grazing to meet management objectives.
8. Livestock handling requirements of the operator and grazing system preference.
9. Existing range improvements--location and condition.
10. Needed improvements and development practices.
11. Resource specialist professional judgment of system considered best adapted to achieve resource objectives.

After a detailed consideration of these factors, the resource specialists proposed several grazing systems for implementation in the Upper-Gila San Simon ES area, as described below.

Rest-rotation. The rest-rotation grazing management system is designed to provide for the growth requirements of vegetation valuable for the production of livestock and other resource values. Under this system, each range area would be rested from 20 to 50 percent of the time. Under rest-rotation grazing management the range is divided into pastures. Each pasture is systematically grazed and rested to provide for the production of livestock and other resource values and at the same time to maintain and improve soil fertility and vegetation (Hormay, 1970).

The range is maintained and improved almost entirely by its timely resting from livestock use (Hormay, 1970). Resting a unit of range after a period of grazing allows the opportunity for (1) plants to make and store food to recover vigor, (2) seeds to ripen, (3) seedlings to become estabilihed, and (4) litter to accumulate between plants (Hormay, 1970).

Rest-rotation grazing includes the following basic treatments: (1) grazing for livestock production, (2) rest after grazing to allow seeds to ripen, followed by grazing for seed trampling, and (3) rest to recover plant vigor, to allow for litter production, and to allow seedlings to become established.

DESCRIPTION OF THE PROPOSAL

The rest-rotation grazing management system is best suited to grazing units having three or more pastures of nearly equal carrying capacities. In the ES area, rest-rotation grazing is proposed for those units most apt to benefit from this particular system where the required pastures can be provided.

The following criteria are used for selecting the rest-rotation grazing system:

1. The requirement for long periods of rest to restore range condition, plant vigor, and vegetation cover.
2. The need to tailor grazing system treatments to the physiological requirements of specific key management species (see table 2-4 and 2-5 for phenology of key species).
3. The need to manipulate vegetation communities to produce desirable species compositions within a relatively short period of time.

Within the ES area, the majority of grazing units for which the rest-rotation system is proposed would have four pastures. The following diagram illustrates grazing formula for a four-treatment grazing system.

		MONTHS	Main Effect
		M A M J J A S O N D J F	
Treatment	A	/ / / / / /G/r/a/z/e/ / / / / / /	Livestock production Stimulate growth
	B	R e s t	Vigor restored, litter production
One Cycle	C	R e s t 8/G/r/a/z/e/ /	Vigor, litter, seeds ripen, seed trampling
	D	R e s t	Seedling establishment, vigor restored, litter production

8 = Seedripe

The following diagram shows how this system would work during a 5-year period.

FOUR-PASTURE REST-ROTATION GRAZING SYSTEM

Year	Pasture	MONTHS: M A M J J A S O N D J F
1	1	/ / / / /G/r/a/z/e/ / / / / / / /
	2	R e s t
	3	R e s t 8//G/r/a/z/e
	4	R e s t
2	1	R e s t
	2	R e s t 8/G/r/a/z/e/
	3	R e s t
	4	/ / / / /G/r/a/z/e/ / / / / / / /
3	1	R e s t 8/G/r/a/z/e/
	2	R e s t
	3	/ / / / / /G/r/a/z/e/ / / / / / /
	4	R e s t
4	1	R e s t
	2	/ / / / / /G/r/a/z/e/ / / / / / /
	3	R e s t
	4	R e s t 8/G/r/a/z/e/
5	1 2 3 4	Same as Year 1

The mild climate and erratic rainfall within the ES area cause flowering and seedripe times to vary from year to year. Treatments for rest rotation are thus timed for the dates that most closely approximate these growth stages. The specific dates for these treatments may be adjusted for the particular year. See tables 2-4 and 2-5 for phenology of the key species.

Rest-rotation grazing systems would be applied to 13 grazing units, affecting 334,142 acres of public lands and 111,720 acres of private and State land. The Woods Canyon #37, Ash Peak #50, Joy Valley #59, Murchison #62, and Day Mine # 154 grazing units are already following a rest-rotation grazing system. Their AMPs were implemented between 1970 and 1976 and involve 167,004 acres of public lands and 36,201 acres of other lands.

Santa Rita Three-Pasture Rotation. The Santa Rita three-pasture rotation system was developed in southeastern Arizona on semidesert grass-shrub type vegetation similar to much of the vegetation in the ES area. It is similar to rest-rotation system, the basic difference lying in the timing of rest periods and ability of this system to meet the physiological requirements of preferred forage species.

The primary criteria for selecting the Santa Rita three-pasture rotation system are as follows:

1. The need for rest periods to approximate annual climatic periods that coincide with critical stages of plant growth for both cool-season and warm-season plants within a grazing unit.
2. The need for two full spring and summer rest periods to restore or maintain range condition and plant vigor. These rest periods provide adequate grazing to achieve vegetal healing of problem areas.
3. The desire to manipulate vegetation communities to produce desirable species compositions through managed grazing.
4. The current pasture layout and allottee's general operation would enable this system to be implemented with relatively minor changes in present management or existing improvements.

Preliminary research, on which this system is based, found spring-summer rest 2 years out of 3 to be the most effective rest schedule out of 15 that were tried (Martin, 1973).

The Santa Rita three-pasture rotation grazing system would be applied to 25 grazing units, affecting 279,575 acres of public lands and 197,261 acres of private and State lands. The Santa Rita system was implemented in March 1973 on the Rocky John #20 grazing unit, which has 1,000 acres of public lands and 2,014 acres of other lands.

The Santa Rita system provides three grazing treatments, with rest for 24 months of the 36-month grazing cycle. Each pasture in the three-pasture set is rested March through October, 2 years out of 3. Winter grazing is scheduled between the two successive March-October rest periods. This schedule provides 12 months of rest immediately before each period of spring-summer grazing and is expected to reduce the intensity of grazing and regrazing on favorite plants in the spring (Martin, 1975). The grazing and resting treatments of any given pasture over a 3-year period would be as follows:

Treatment	MONTHS M A M J J A S O N D J F	MAIN EFFECT
A	/ / / /G/r/a/z/e/ / / / R e s t	Livestock production Stimulate growth
B	R e s t	Establishment of seedlings, vegetative reproduction, and vigor
C	R e s t G/r/a/z/e/	Seed production, plant vigor, seed scattering, and trampling

The following diagram shows how this system would work during a 4-year period.

SANTA RITA THREE-PASTURE ROTATION

MONTHS

YEAR	PASTURE	M A M J J A S O N D J F
	1	/ /G/r/a/z/e/ / / / / / R e s t
1	2	R e s t /G/r/a/z/e/
	3	R e s t
	1	R e s t /G/r/a/z/e/
2	2	R e s t
	3	/ /G/r/a/z/e/ / / / / / R e s t
	1	R e s t
3	2	/ /G/r/a/z/e/ / / / / / R e s t
	3	R e s t /G/r/a/z/e/
4	1 2 3	Same as Year 1

Deferred Rotation. The proposed deferred rotation grazing systems include six different grazing/resting arrangements. To aid the biological and physiological processes of the plant community, deferred grazing systems are designed to provide rest from livestock grazing for various parts of the range in succeeding years during the growing season. These systems provide rest from 25 to 50 percent of the time. Each system is tailored to the needs or constraints of each grazing unit, and each system may be unique in the timing and amounts of livestock use or rest provided, depending upon the situation. In the proposed action, two-pasture, three-pasture, four-pasture, and five-pasture rotation systems would be used.

The following criteria were used for selecting the deferred rotation system:

1. The restriction of management system options by allotment size and shape or physiography.
2. The ability to satisfy resource management objectives without long rest periods.
3. The ability to maintain range condition and plant vigor.
4. The current pasture layout and allottee's general operation would enable this system to be implemented with little change in present management or existing improvements.

Typical two- and three-pasture deferred rotation systems are shown as follows:

TWO-PASTURE DEFERRED ROTATION

Treatment	MONTHS: M A M J J A S O N D J F	MAIN EFFECT
A	/ / / /G/r/a/z/e/ / / / / / R e s t	Livestock production Stimulate growth
B	R e s t /G/r/a/z/e	Seed production, plant vigor, seed scattering, and trampling

THREE-PASTURE DEFERRED ROTATION

Treatment	MONTHS: M A M J J A S O N D J F	MAIN EFFECT
A	/ / / / / /G/r/a/z/e/ / / / / / / / /	Livestock production Stimulate growth
B	R e s t	Establishment of seedlings, vegetative reproduction, and vigor
C	/ / / / / /G/r/a/z/e/ / / / / / / / /	Livestock production Stimulate growth

The following diagram shows how a two- and three-pasture deferred rotation system would work over a 3- to 4-year period.

TWO-PASTURE DEFERRED ROTATION

MONTHS

YEAR	PASTURE	M A M J J A S O N D J F
1rst	1	/ / /Graze/ / / / / / / / Rest
	2	Rest / Graze / /
2nd	1	Rest / /Graze/ /
	2	/ / /Graze/ / / / / / / / / Rest
3rd	1 2	Same as Year 1

THREE-PASTURE DEFERRED ROTATION

MONTHS

YEAR	PASTURE	M A M J J A S O N D J F
1rst	1	/ / / / / / /Graze/ / / / / / / / /
	2	Rest
	3	/ / / / / / /Graze/ / / / / / / / /
2nd	1	Rest
	2	/ / / / / / /Graze/ / / / / / / / /
	3	/ / / / / / /Graze/ / / / / / / / /
3rd	1	/ / / / / / /Graze/ / / / / / / / /
	2	/ / / / / / /Graze/ / / / / / / / /
	3	Rest
4th	1 2 3	Same as Year 1

The deferred rotation grazing system would be applied to eight grazing units, affecting 89,973 acres of public lands and 57,275 acres of private and State lands. Five of these grazing units, involving 70,437 acres of public lands and 30,412 acres of other lands, are already following some type of deferred rotation grazing system. The Gila #7, Midway Canyon #60, Y.L.E. #148, Johnny Creek #165, and Bonita Creek #166 grazing units were implemented between 1970 and 1974.

Seasonal Grazing. Seasonal grazing management is applied to obtain periodic rest in situations where other systems cannot be readily adapted. Under a seasonal grazing system, the grazing unit is used only a portion of the year during a specified period, and livestock are removed from the unit for a portion of the year.

The primary criteria for selecting seasonal grazing systems are as follows:

1. The restriction of management system options by grazing unit size and shape or physiography.
2. The ability to satisfy resource management objectives.
3. The ability to satisfy range livestock operation, i.e. the system represents only a portion of the total operation.

Three basic types of seasonal grazing management are proposed for the ES area: summer, winter, and winter rotation.

Summer Seasonal Grazing. Summer seasonal grazing would occur on certain units that include privately owned irrigated land grazed in conjunction with public lands. The predominant forage production and livestock use would occur on the privately owned irrigated land. The public lands would only be grazed lightly during the summer. The pasture would be rested from grazing for the balance of the year, and and the cattle would be removed. The grazing period would remain the same every year.

SUMMER SEASONAL GRAZING

MONTHS M A M J J A S O N D J F	MAIN EFFECT
Rest /G/r/a/z/e R e s t	Livestock production Stimulates growth

Winter Seasonal System. Under the winter seasonal system of management, a unit would be grazed each fall, winter, and early spring, and rested from grazing during the late spring and summer when the livestock would graze on other lands. The key to winter seasonal grazing is proper vegetation utilization, avoiding damage to cool-season species and palatable shrubs. The following diagram shows the grazing/resting treatment of a winter seasonal system. The grazing period is the same every year.

WINTER SEASONAL GRAZING

MONTHS	MAIN EFFECT
M A M J J A S O N D J F	
G/a/e/ R e s t /G/r/a/z/e	Seed production, plant vigor, seed scattering, and trampling

Winter Seasonal Rotation System. This system would allow livestock grazing in alternating winter seasons. Winter grazing during 1 or 2 years would be followed by a complete year's rest. This system would be applied where adapted to specific situations, especially where fragile vegetation conditions require rest during every summer growing season in addition to rest during fall, winter, and spring periods. Two winter seasonal rotation systems are illustrated as follows.

WINTER SEASONAL ROTATION
SYSTEM 1

Treatment	MONTHS M A M J J A S O N D J F	MAIN EFFECT
A	/ G/r/a/z/e / R e s t /G/r/a/z/e/	Seed production, plant vigor, seed scattering, and trampling
B	R e s t	Establishment of seedlings, vegetative reproduction, and vigor

R E P E A T

SYSTEM 2

Treatment	MONTHS M A M J J A S O N D J F	MAIN EFFECT
A	G̸ra̸ze̸ R e s t /G/r/a/z/e/	Seed production, plant vigor, seed scattering, and trampling
B	G̸ra̸ze̸ R e s t /G/r/a/z/e/	
C	R e s t	Establishment of seedlings, vegetative reproduction, and vigor

The following diagram shows how winter seasonal rotation systems 1 and 2 would work over a 3 to 4-year period.

WINTER SEASONAL ROTATION
SYSTEM 1

YEAR	PASTURE	MONTHS M A M J J A S O N D J F
1	1	/Gr̸az̸e/ / Rest / / G̸ra̸ze̸ / /
	2	Rest
2	1	Rest
	2	/Gr̸az̸e/ / / / G̸ra̸ze̸ / /
3	1 2	Same as Year 1

SYSTEM 2

YEAR	PASTURE	MONTHS: M A M J J A S O N D J F
	1	/Graze/ / Rest / / Graze / /
1	2	/Graze/ / Rest / / Graze / /
	3	Rest
	1	/Graze/ / Rest / / Graze / /
2	2	Rest
	3	/Graze/ / Rest / / Graze / /
	1	Rest
3	2	/Graze/ / Rest / / Graze / /
	3	/Graze/ / Rest / / Graze / /
4	1 2 3	Same as Year 1

Seasonal grazing would be applied to 17 grazing units, affecting 98,732 acres of public lands and 77,418 acres of private and State lands. Five of these grazing units involving 44,903 acres of public lands and 50,497 acres of other lands are already following some type of seasonal grazing system. The Slash Hook #3, Hickey #4, Midway #91, Copper Creek #145, and Diamond Bar #151 grazing units were implemented between 1972 and 1975.

Yearlong Grazing. Yearlong grazing is continuous grazing for the full calendar year (Range Term Glossary Committee, 1974). The primary criterion for selecting yearlong grazing is the restriction of management and system options that provide periodic rest or rotation by either grazing unit size or physiography. Included are areas where additional fences to establish pastures necessary for rotation grazing would interfere with other resource values such as the movement of wildlife.

Yearlong Grazing. Yearlong grazing is the most common system on semidesert ranges (Martin, 1975). Proper grazing use under this system is dependent upon stocking rates consistent with the grazing capacity of the range and upon proper distribution of livestock use.

Yearlong grazing under intensive management would be applied to 24 grazing units, affecting 237,907 acres of public lands and 189,304 acres of private and State lands. No grazing units in the ES area are currently under a yearlong intensive management system.

Custodial Grazing Management

Custodial grazing management is applied in areas having an acceptable range condition and a stable or improving trend. Under custodial management BLM management actions are limited to licensing livestock use based on the AUMs available on the public lands, and the individual ranch operator determines the livestock numbers and grazing system (if any) to be used. At least once a year BLM checks these grazing units to insure that the utilization on public lands is not excessive, that range condition and trend are being maintained, and that applicable regulations are being followed. If utilization is found to be excessive or the range trend to be down, BLM will adjust livestock numbers on the total grazing unit. Grazing units managed custodially include areas where the effects of livestock use on the public land resources are anticipated to be minimal. Selection of public land areas for custodial management is based on the following criteria:

(1) Small isolated or intermingled tracts of public lands generally smaller than 640 acres with no significant multiple-use values or potential,
(2) Public land areas where management is significantly compromised by other land ownerships.
(3) Conflicts with other resources not identified in inventory and planning process.
(4) Good to excellent range condition and stable or improving range trend.
(5) Satisfactory range management practices.

Custodial management would be applied to 33 grazing units, affecting 38,161 acres of public lands and 217,861 acres of private and State lands.

Ephemeral Grazing Management

Ephemeral ranges are areas of low rainfall and low forage production. These areas would be grazed infrequently for short periods when favorable precipitation allows the growth of relatively large amounts of short-lived annual forage. Rangelands proposed for ephemeral management generally receive less than 8 inches of average annual precipitation and are located in the lower elevations (below 3,200 feet). Ephemeral range plant communities have a minor percentage of perennial forage plants, generally not more than 10 percent of the total plant composition. These ranges annually produce an average of no more than 25 pounds of perennial forage per acre.

To comply with the resource constraints of ephemeral range areas, livestock use would be authorized only during favorable periods when relatively large quantities of annual vegetation are produced. Such use would be based on range inspections following favorable rainfall and growth conditions. Livestock grazing would not be authorized in the absence of sufficient ephemeral forage. In authorizing ephemeral grazing, the District would consider AMP objectives, other resource needs, and protection of the perennial vegetation. The unpredictability of favorable forage conditions would not allow predetermined schedules for grazing (Valentine, 1967).

Ephemeral grazing management would be applied to 65 grazing units, affecting 250,155 acres of public lands and 116,914 acres of private and State lands.

Deferment of Grazing

Proposed for deferment are critical watershed areas along the San Simon River and critical riparian and aquatic wildlife habitat along several streams in the ES area.

The watershed area is in a critical-to-severe erosion condition class and would be deferred from livestock use until the vegetation cover and litter production are increased sufficiently to maintain adequate watershed protection while sustaining livestock. Livestock grazing would be authorized on deferred areas whenever significant conflicts with other resource needs are not anticipated or range condition is not expected to deteriorate with grazing. The majority of the fences required to manage these areas have already been constructed.

The public lands with critical riparian and aquatic habitats, including springs, would be fenced to permit the necessary specialized management. Alternative livestock water sources would be constructed outside these areas. These areas would be deferred from grazing for a minimum of 3 to 5 years to allow the propagation and improvement in condition of riparian vegetation. Severely eroded areas proposed for deferment would be grazed after rehabilitation and revegetation, probably after 15 to 25 years. During the deferment period, habitat and vegetation studies would be implemented. Subsequent management would depend upon the response and improvement of these areas. Where natural revegetation does not occur, desirable species would be planted.

Following an initial deferment period, grazing might be allowed under the following conditions: (1) that desirable riparian plants be established and maintained, (2) that grazing not occur more often than 1 year out of 3 during the critical March through October growing period, (3) that grazing not occur for longer than an 8-month period at a time, and (4) that utilization of desirable species not exceed 40 percent of the current year's growth. A given watercourse would be divided with fences, where feasible, to prevent livestock from grazing the entire length at any given time

Deferment of livestock use is proposed for portions of nine units, including 14,050 acres of public lands and 1,550 acres of private and State lands.

Management of Lands Unallocated for Grazing

Grazing units whose public lands have no grazing privileges are referred to as "unallocated." The Safford District proposes no grazing managment on these units and considers any livestock grazing on public lands in these units as trespassing. A qualified applicant, however, could be allowed to graze livestock on these lands, upon the completion of an Environmental Assessment Record. Eight grazing units are unallocated, affecting 4,014 acres of public lands and 30,050 acres of private and State lands.

Construction of Necessary Range Improvements

Construction of range improvements would be necessary to implement and operate the various types of grazing management included in the proposal. Construction of adequate water facilities, for example, would be necessary in areas designated for livestock grazing. Also, construction of fences would be required in many areas to establish the necessary pastures for specific grazing systems.

Table 1-3 shows range improvements that would be necessary to implement the proposed action.

TABLE 1-3
TEMPORARY AND PERMANENT LAND DISTURBANCE FROM
RANGE IMPROVEMENTS

Range Improve-ments	Number (or Miles) of Range Improvements	Acres Temporarily Disturbed	Acres Permanently Disturbed
Fences	153 miles	153	0
Pipelines	136 miles	136	0
Water Troughs	121	1	1
Water Storage Tanks	65	10	2
Earthen Reser-voirs	121	108	81
Rainfall Catch-ments	8	4	3
Wells	5	1.25	0
Spring Develop-ments	4	1	0
Detention Dams	3	100	50
Roads and Trails	300 miles	225	225
Total Acres Disturbed		739.25	362

Appendix D presents a listing of proposed range improvements by grazing unit. The locations of proposed and existing range improvements are shown on plate 2.

Construction Stipulations. The following stipulations would be followed in the construction of the proposed range improvements.

(1) Permanent roads or trails will not be constructed to project sites. Existing access and off-road vehicles would be used where needed. (BLM policy)
(2) An archaeological clearance will be required for each project site before construction. Intensive surveys will be conducted to locate any cultural or paleontological remains present. If such remains are discovered, the improvement will be relocated or redesigned to avoid the remains. If the project cannot be moved, a mitigative data recovery or salvage program will be completed before construction. The clearance process will comply with relevant laws and required procedures throughout.

Permits required for construction will contain stipulations to protect buried resources and provide for additional surveys should project locations be changed. (BLM policy; National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Executive Order 11593; 36 CFR Part 800).

(3) An endangered plant survey and clearance will be required for each project site before construction. If threatened or endangered plants are found and the range improvements would diminish the value of the habitat for the species encountered, the project will be relocated or abandoned (Arizona BLM policy). When any candidate's endangered or threatened plant species is formally listed and the Bureau's proposed action may affect a listed plant species, the Bureau will formally initial consultation with the Fish and Wildlife Service under Sec. 7 of the Endangered Species Act.

(4) Disturbance of soil and vegetation at all project sites will be held to an absolute minimum (BLM policy; BLM Manual 6300).

(5) Land clearing will be held to a minimum, generally restricted to sites requiring excavation. (BLM policy; BLM Manual 6300).

(6) Areas of soil disturbance will be finished to blend into the surrounding soil surface. (BLM policy; BLM Manual 6300).

(7) An endangered animal clearance will be required before any construction can be started. If threatened or endangered species are found and the improvements would lessen the value of the habitat for the given species, the project will be relocated or abandoned. If the project will impact an endangered or threatened wildlife and the project can not be relocated or abandoned, consultation with the Fish and Wildlife Service will be requested under Sec. 7 of the Endangered Species Act. (BLM Manual 6840; Endangered Species Act of 1973).

(8) Visual resource management (VRM) procedures will be employed to minimize the adverse visual impacts created by the proposed action. Through thoughtful planning and good design, proposed range improvements will be made to blend gracefully with the natural landscape. The visual resource contrast rating will be conducted before the construction of the proposed improvements (BLM policy; BLM Manual 6300). Where the visual resource will be impaired, the range improvements will be modified by design, location, or both as necessary to meet VRM class objectives.

(9) The wilderness inventory, in accordance with Sec. 603 (a) of the Federal Land Policy and Management Act (FLPMA), has not been completed on the public lands that would be impacted by proposal. Prior to implementation of any action which could impair suitability for wilderness, the areas will have to be inventoried and impacts on potential or existing wilderness areas assessed.

Until Congress acts on an area that has been designated for wilderness study, existing multiple-use activities, including grazing and supporting activities, will continue. New uses or expanded existing uses will be allowed if the impacts will not impair the suitability of the area for wilderness.

(10) The construction of the detention dams is contingent upon the application for and issuance of a section 404 permit from the Corps of Engineers as required by Public Law 92-500.

Maintenance of range improvements would be the responsibility of either the licensee or BLM. Maintenance responsibility is provided in the range improvement project plans.

Description of Improvements. Following is a description of each type of required range improvement.

Fences. Fences would be designed to prevent the passage of livestock without stopping the movement of wildlife. Fence materials usually consist of steel wire with steel or wood posts, with four strands of wire attached to posts anchored in the ground. The top wire would be 42 inches from the ground and the bottom wire 16 inches from the ground.

In antelope habitat areas fences will be constructed with three strands of wire, with the top wire 38 inches from the ground and the bottom wire 18 inches from the ground.

All fences will be constructed in compliance with BLM standard fencing specifications and VRM design procedures.

To lessen the impact of an unnatural line in the landscape, fences will not be skylined (placed along a ridge line) or located at right angles to important recreation roads or viewpoints. In all cases, long, straight fence line tangents will be avoided.

The contrast created by modifying the basic elements of color and texture will be minimized by not allowing scaping or blading of the fence alignment and by hauling and distributing construction material so as to least disturb the surface.

Fence line contrasts will be minimized by avoiding the separation of blocks of contrasting native vegetation in the design of fences needed for the exclusion of livestock from spring developments and water catchments.

Fenceposts will be painted gray to reduce visibility, unless the fence is located in an area where visibility is needed to prevent the fence's becoming a hazard to off-road vehicle travel.

Fence construction would normally require 15 to 20 trips by off-road vehicles along the fence line, which, along with the fence construction, would disturb an estimated 1 acre per mile, for a total of 153 acres surface disturbance for the 153 miles of proposed fences.

Water Developments. Water developments will be located to provide an adequate distribution of water for livestock and big game wildlife species.

In important wildlife areas, wildlife watering facilities will be developed at ground level with either a float valve or orifice to regulate the flow of water. These wildlife waters will provide water for wildlife on a yearlong basis. A minimum of 2 acres will be fenced aroudn each facility to exclude livestock. Where possible, water catchments and pipelines will be located to take advantage of screening topography and vegetation. The contrasts in color and texture will be minimized by disturbing the narrowest possible strip of land surface and vegetation.

The change in the landscape form resulting from the addition of storage tanks and troughs will be minimized by not skylining structures visible from recreation roads or viewpoints.

Storage tanks and troughs will be painted to blend with the surrounding natural earth and vegetation colors. Paint colors will correspond to natural colors most evident during the peak recreation season.

Water catchments will be screened from recreation roads and viewpoints by planting indigenous vegetation.

Pipeline. Plastic or steel pipe would be laid to carry drinking water for livestock and wildlife from dependable water sources to areas lacking an adequate supply. Generally, 1- to 2-inch diameter plastic pipe would be buried with a pipe-laying device mounted on a tractor. Galvanized steel pipe (3/4 to 1½ inch in diameter) would be hand laid with a trencher or backhoe.

Pipe would be laid as deeply as possible under the ground but no deeper than 30 inches (figure 1-1). Pipe depth would depend on the depth of rock or restrictive layers. Where surface rock prohibits burying, the pipe would be laid on the surface. In some instances, particularly where steel pipe is laid, a back hoe or trencher would be used to prepare the trench.

An estimated 1 acre per mile would be disturbed during pipeline installation, for a total of 136 acres of surface disturbance for the 136 miles of proposed pipeline.

Water for wildlife will be provided at ground level where a pipeline crosses desirable wildlife habitat. Wildlife waters will be fenced with at least a 200-foot by 200-foot paddock, preferably a 500-foot by 500-foot paddock. These waters will be provided on a yearlong basis to wildlife, and water will be maintained in the rested pasture for wildlife.

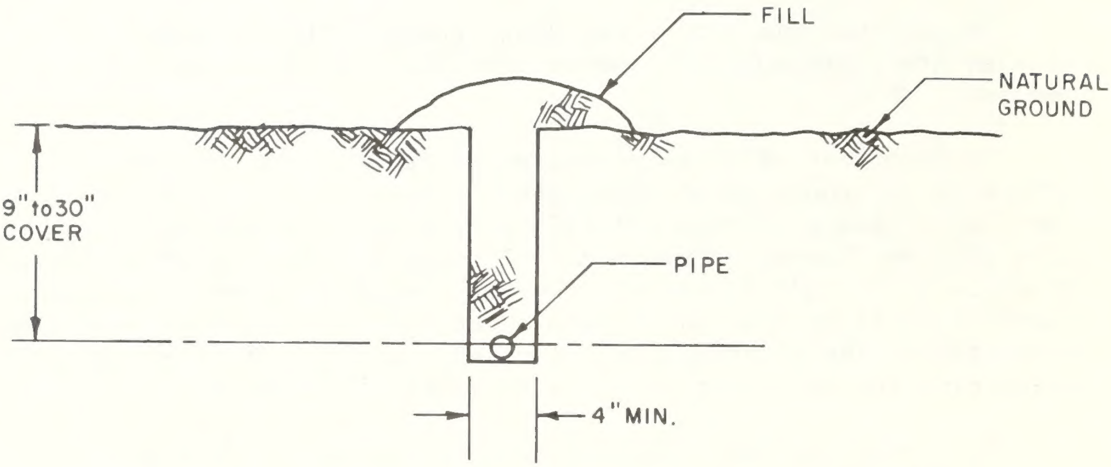


Figure 1-1 Typical Pipeline

Water Troughs. Steel, concrete, or masonry structures would be designed to hold drinking water for livestock and wildlife and allow animals to drink safely from them. These drinking troughs would be no more than 24 inches tall and 8 feet in length and would have capacities of 100 to 1,000 gallons. Included would be water control appurtenances such as float valves.

To insure the safety of wildlife that might drink from proposed water troughs, escape devices would be installed in each trough. An example of such a device would be a ramp covered with wire mesh, attached to the top edge of the trough and extending downward at an angle to the bottom of the trough. This device would enable small animals and birds to escape should they fall into the water. Figure 1-2 shows a typical steel water trough with an escape device installed.

In addition to escape devices, alternate watering facilities for wildlife would be provided where necessary. An example of a wildlife watering facility would be a "game guzzler." These alternate water sources would be installed near (within 300 feet) the proposed water trough involved. Figure 1-3 shows a typical installed "game guzzler".

Approximately 50 square feet of surface are anticipated to be occupied by each water trough. Thus, for the 121 proposed water troughs, less than 0.15 acres would occupied. Approximately 1 acre is expected to be disturbed around the 121 troughs.

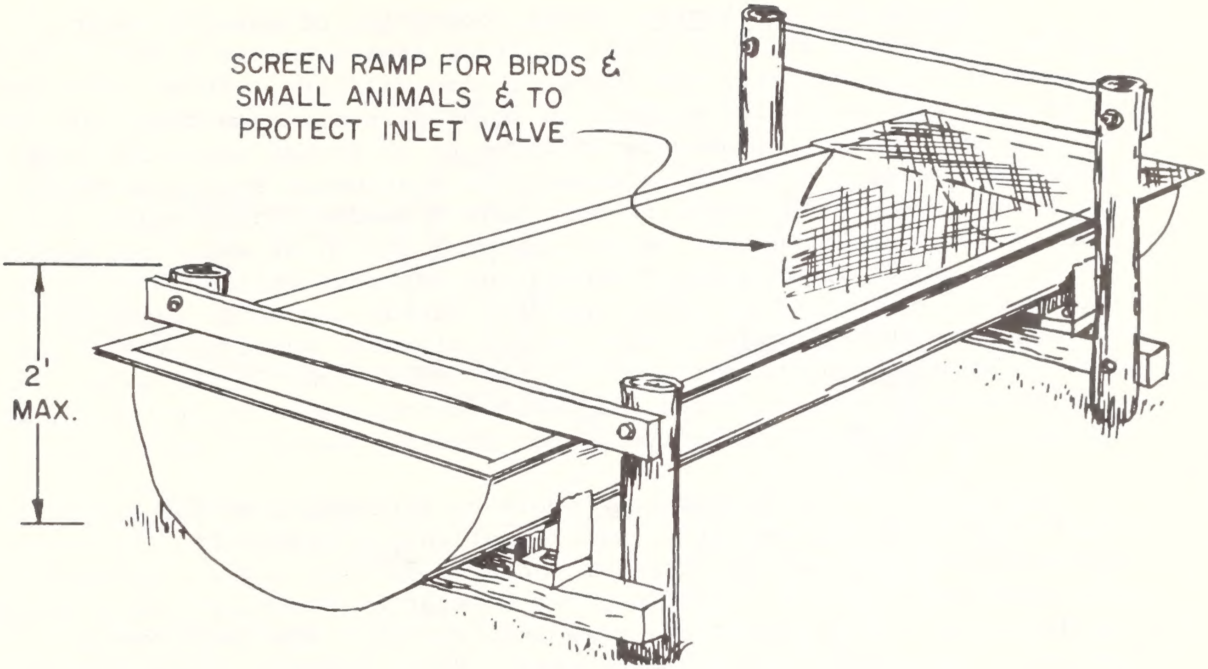


Figure 1-2 Typical Steel Water Trough

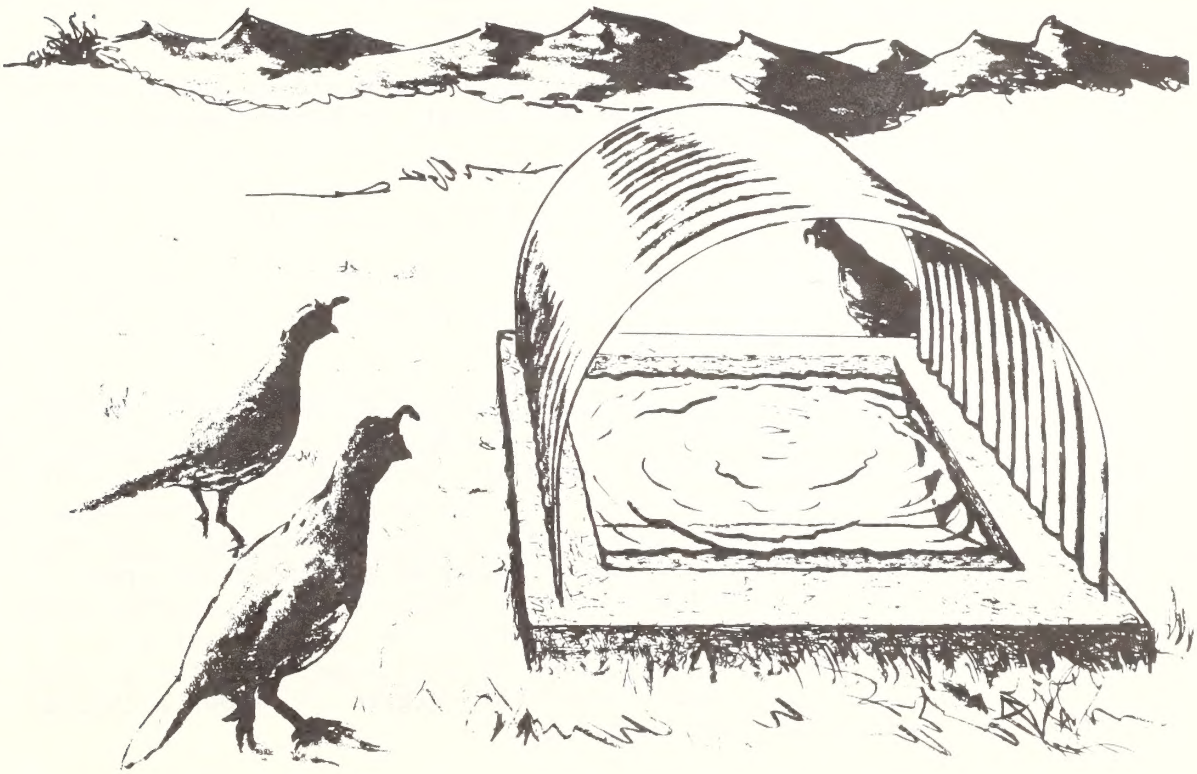


Figure 1-3 Typical Game Guzzler

Water Storage Tanks. Steel, concrete, or masonry water-holding structures would be built to store approximately 5,000 to 40,000 gallons of drinking water for livestock and wildlife. These structures would generally not allow animals to drink directly from them, but they would allow substantial amounts of water to be stored where the available water sources do not provide a dependable continuous supply or when the amount provided is too small to meet peak demands. For example, a pipeline that would deliver an average of ½ gallon of water per minute during the moist seasons would provide an adequate amount of water for only a small number of animals, and only during the moist seasons. On a continuous basis, however, 720 gallons of water would be stored per day--an amount adequate for a relatively large number of animals. The surplus water not used during the moist seasons would be stored and made available for periods of the year when drinking water is scarce.

The size of the storage tank would be determined by the amount of water needed and the amount of water available. Generally, the tanks would be 15 to 30 feet in diameter and 6 to 12 feet high. The tops of the tanks would either be enclosed or consist of floating covers placed on the water surface to impede high evaporation. The tanks would generally be placed on a concrete base. Some, however, would have a steel bottom and would be assembled by bolting or welding together prefabricated sections. Other tanks would consist of a steel rim with a concrete or masonry bottom. Each tank would be equipped with a drain and overflow pipe. To lessen the visual impact, the outside of the tank would be painted to blend into the landscape.

Those storage tanks with a floating cover would be equipped with a wire mesh-covered ladder to allow any animals or birds trapped in the storage tank to escape.

Figure 1-4 shows a typical water storage tank after construction.

Less than ¼ acre of surface would be disturbed by the construction of each facility. Approximately 10 acres of surface would be disturbed for the 65 proposed storage tanks.

Earthen Reservoirs. Earth-fill dams would be built to impede the flow of small watercourses and impound water for livestock and wildlife. The reservoirs would generally provide a supplemental water source but would not be dependable on a yearlong basis. They would usually be depleted of water during periods of low rainfall, particularly from March to mid-June. Water would be impounded in a pond, from which animals would drink directly. Water storage capacity would be from ½ to 1½ acre-feet. Surface disturbance is anticipated to amount to 9 acres for the construction of each reservoir, for a total of 108 acres for the 12 proposed reservoirs. Figure 1-5 shows a typical earthen reservoir after construction.

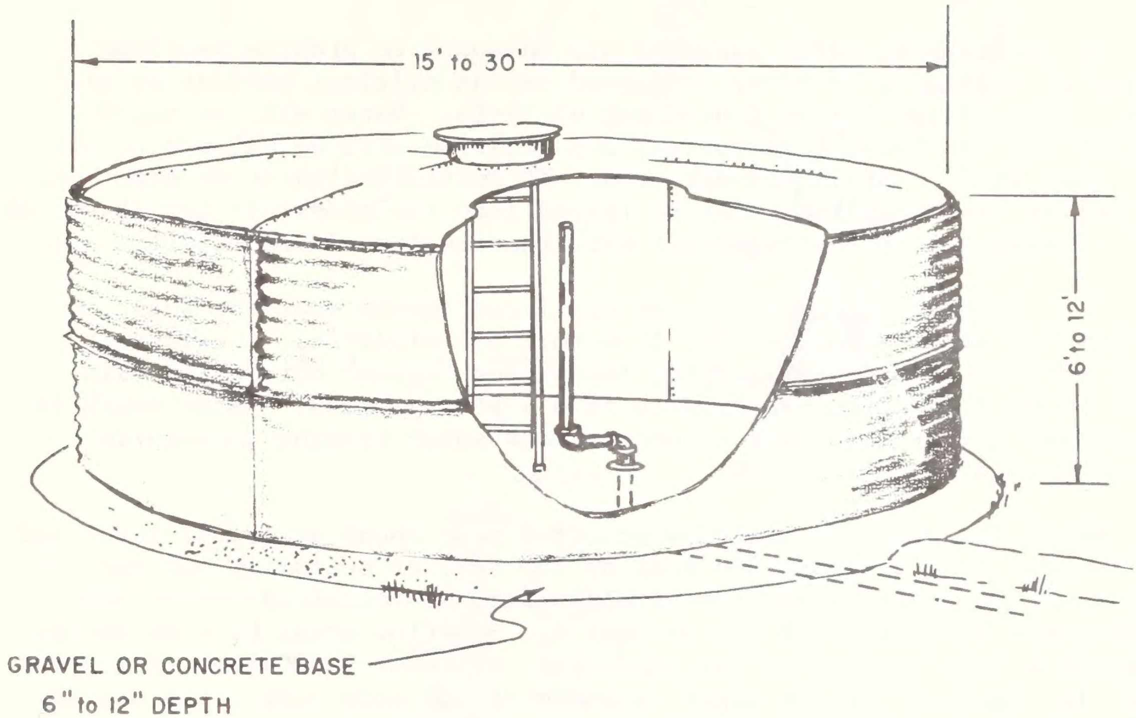


Figure 1-4 Typical Water Storage Tank

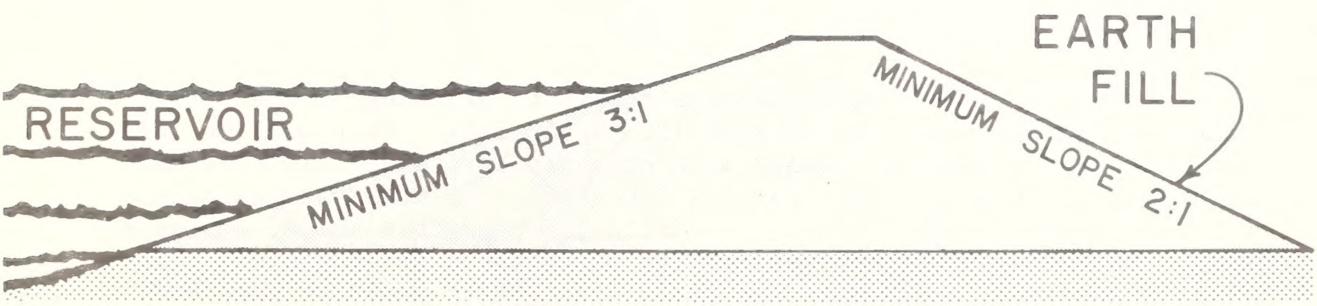


Figure 1-5 Earthen Reservoir

If anticipated water supplies are adequate to provide yearlong livestock water, or if water is needed during critical periods by wildlife, reservoirs will be fenced for wildlife. Water will be piped through the dam for the livestock, and wildlife will be allowed to use the water within the fenced-off area. If sufficient water to pipe out, is lacking then a walkway will be fenced into the reservoir for livestock use. A majority of the reservoir will then be fenced for wildlife use.

Rainfall Catchments. Rainfall catchments would be built to collect and store rainwater for livestock and wildlife. A catchment would consist of a gently sloping impervious "apron" onto which rainwater would collect before flowing into a storage tank. Water would be piped from the storage tank to one or more water troughs to provide drinking water for livestock.

Water for wildlife would be provided year round at ground level and in a fenced area at least 200 feet by 200 feet or optimally 500 feet by 500 feet. The water needs for wildlife will be satisfied before the water needs for livestock are allocated. Overflow areas will be fenced to provide lush vegetation for wildlife. At least 6,400 feet of fencing would be required for the eight catchments. In some cases, the storage tank would be constructed of butyl rubber placed in a pit, forming a bag-like tank. The storage tanks would generally have a capacity of about 50,000 gallons. Pipe would be installed to convey water from the apron to the storage tank and to convey water from the storage tank to drinking facilities. Construction would consist of clearing an area for the apron, treating the soil of the apron area with a sterilant, building the apron, building the storage tank, installing necessary pipe, and installing a water trough. Construction of a protective fence to exclude wildlife and livestock from the apron and storage tank may also be required. Figure 1-6 shows a completed rainfall catchment.

This type of water facility would be used where other water sources are inadequate or lacking. The construction of each rainfall catchment is anticipated to disturb ½ acre. A total of 4 acres would be disturbed for the eight proposed catchments.

Wells. Wells would be constructed by drilling a hole 4 to 8 inches in diameter with depths from 100 to 800 feet. Each well would be cased with steel pipe and sealed with concrete to prevent cave-ins and contamination (figure 1-7). Various types of pumps would be installed to convey water to the surface: windmills, submergible pumps, and pump jacks. Potential power sources for the pumps would include wind, electricity, gasoline, and compressed gas. Electricity would be used only when the well site is located at a powerline. BLM will work with ranchers to keep electric pumps or windmills operating to provide water for wildlife while cattle are not in the pasture.

An anticipated ¼ acre of surface disturbance would occur for each of the five wells, for a total of 1¼ acres.

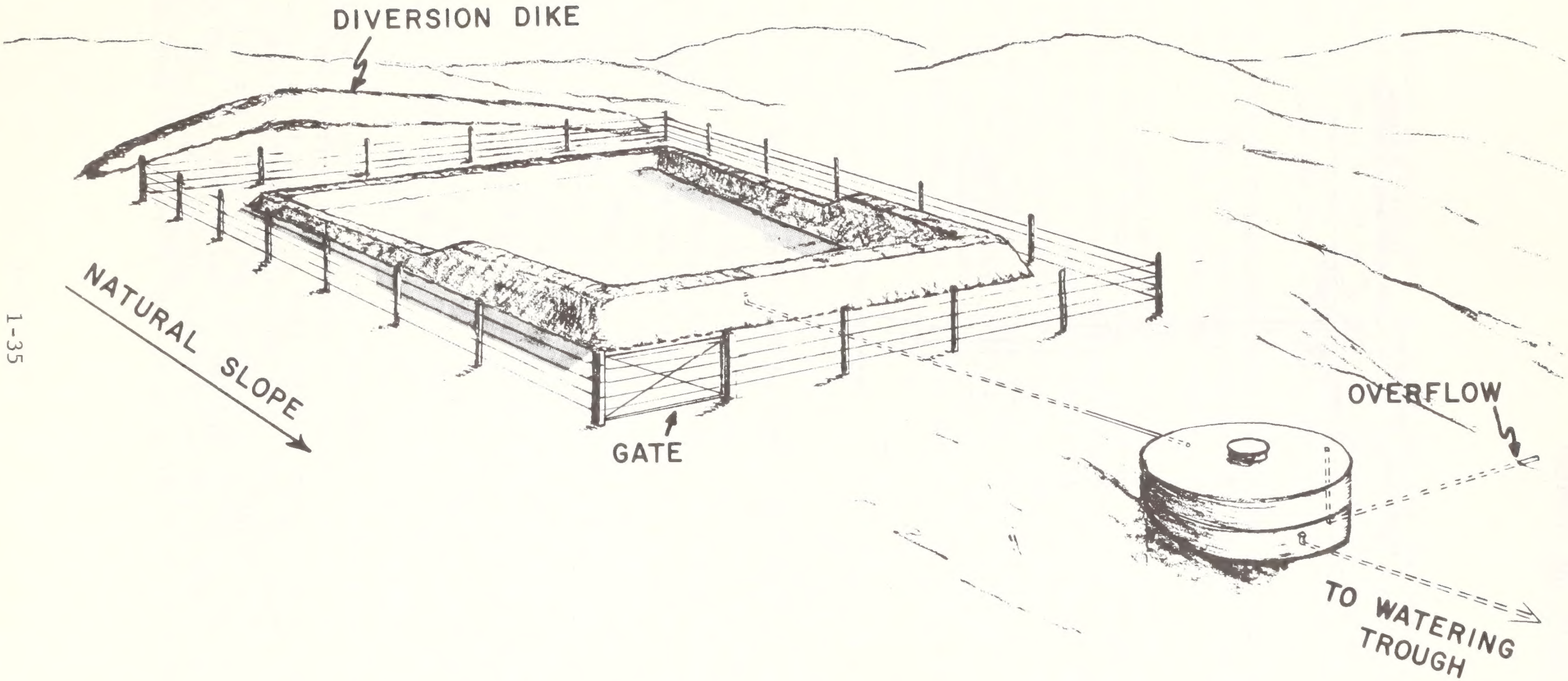


Figure 1-6 Rainfall Catchment

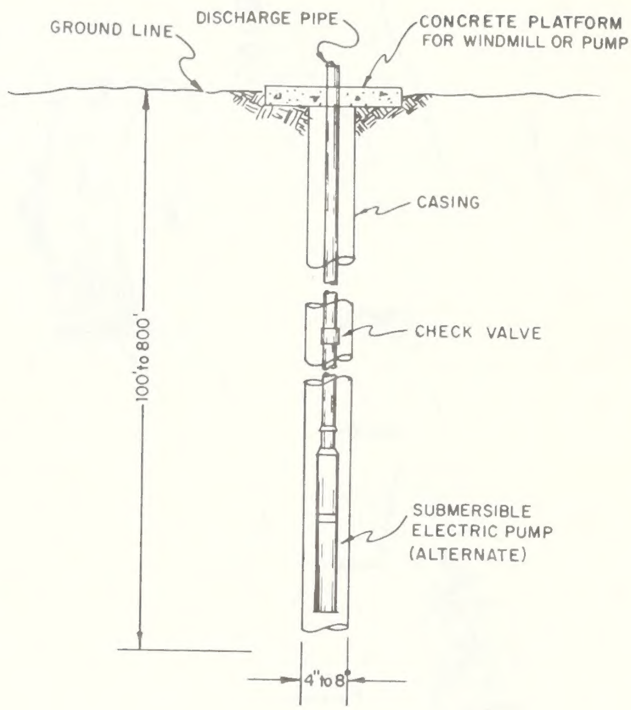


Figure 1- 7 Typical Well Construction

Spring Developments. Spring development would involve digging or drilling to intercept naturally occurring water flow, installing water collection devices such as perforated pipe or concrete chutes or boxes, and installing pipelines and water storage and drinking facilities. Most of the springs proposed for development would provide a dependable, yearlong source of water; some of the proposed spring developments would provide water at all times except for the driest months. Storage facilities, however, would help overcome such a deficiency.

The water to be collected would be piped to a storage tank, drinking trough, or other areas. Each spring is unique, and the proposed developments would be designed for each specific situation.

Most springs within the ES area support an area of comparatively lush vegetation. Areas immediately surrounding springs usually have large trees and other plant species that grow only in wet areas and provide a potential for small but important wildlife habitat areas. Consequently, during spring development sufficient water will be left at the source to insure the survival of and enhance the lush riparian vegetation presently supported by these springs. Moreover, the wet areas immediately surrounding the springs proposed for development will be fenced. Drinking water will be piped outside the fenced wet areas, thus preventing heavy grazing and trampling of the vegetation by livestock. These fences would be a part of the proposed spring developments and are not included under proposed fences. An estimated ¼ mile of fence would be required for each spring development.

Surface disturbance for each spring development is anticipated to comprise ¼ acre. The four proposed spring developments would disturb 1 acre. Figure 1-8 shows a completed spring development.

Detention Dams. The Tanque and Barrier detention dams would be constructed on the San Simon River, a severely eroded drainageway approximately 100 miles long with a watershed area of about 2,200 square miles. (See plate 2.) A third dam, the Slick Rock, would be constructed on Slick Rock Wash, a tributary to the San Simon. These structures would retain sediment while allowing runoff to continue to flow into the Gila River from the San Simon. Significant improvement of the lower portion of the watershed cannot be realized by livestock management alone. These dams would provide stable points from which sedimentation, regrading, and restoration could occur.

The three structures would consist of earth-fill dams approximately 2,500 to 4,000 feet in length with a maximum height of about 40 feet, a concrete or steel overpour drop structure, and a drawdown pipe structure if necessary, as shown in figure 1-9. These structures would interrupt sediment-laden floodwaters produced by rainfall on the San Simon watershed. They would temporarily detain water on their upstream sides, allowing sediment to settle and water to continue flowing from the structures at a slower, controlled rate.

During the first year after construction the San Simon Channel behind the Barrier dam is expected to fill with sediment up to the level of the overpour chute, after which no dead storage of water would occur behind the structure. The chute would function as the principal and emergency spillway to provide adequate drainage for small amd large storms. The channel behind the upper (Tanque) structure is expected to fill with sediment up to the level of the overpour chute in 1 to 5 years. A drawdown pipe would be installed, if necessary, to drain any impounded water below the level of the overpour chute until the channel fills with sediment. The Tanque structure would also have an additional emergency spillway to provide adequate drainage for high-intensity storms expected once in 100 years.

The smallest of the three dams, the Slick Rock would require 100,000 cubic yards of earth-fill material and would have a corrugated metal pipe outlet. This dam would be designed to store water from a 50-year flood, and the channel behind it would fill with sediment to the level of the outlet pipe in 25 years.

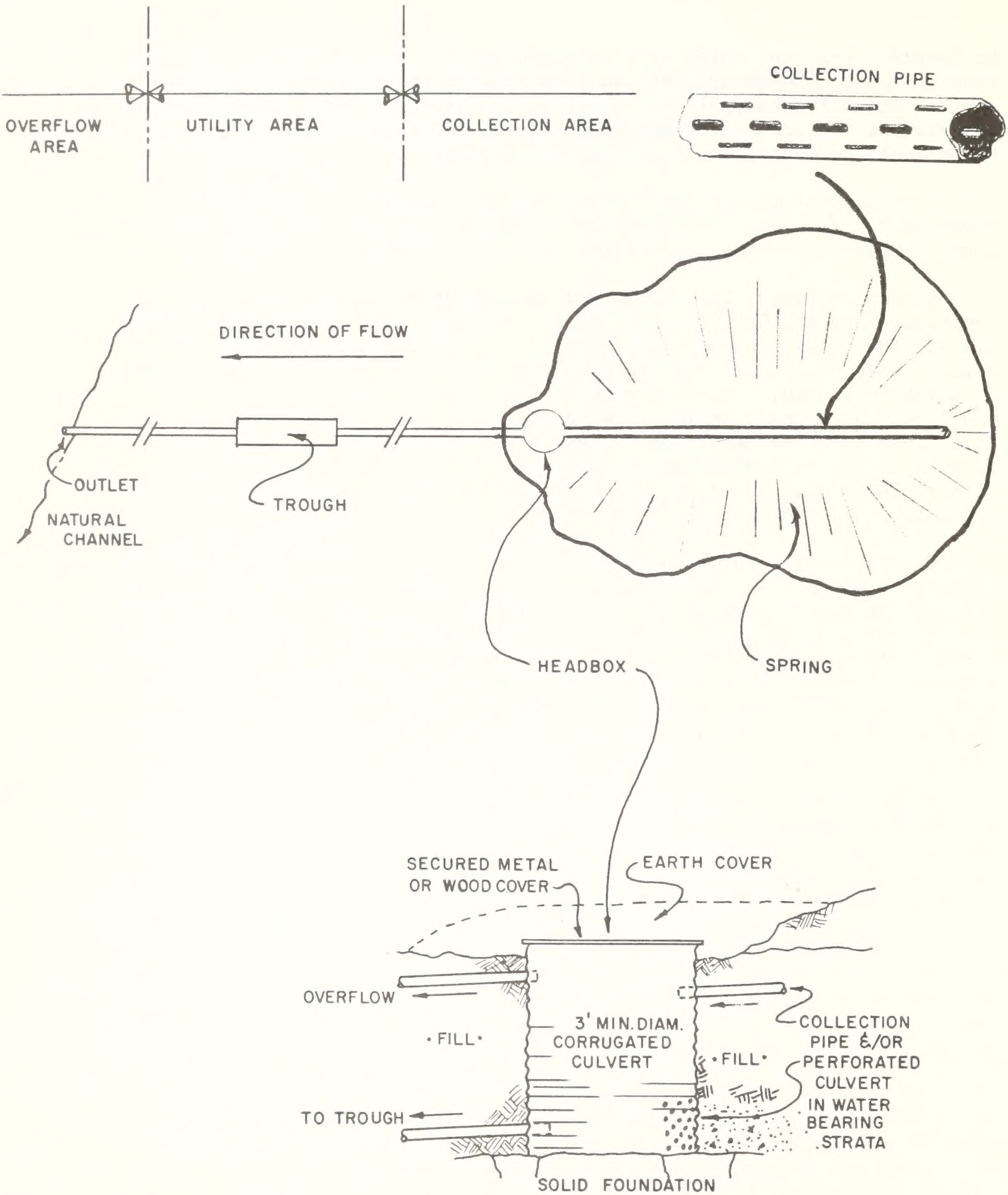


Figure 1-8 Typical Spring Development

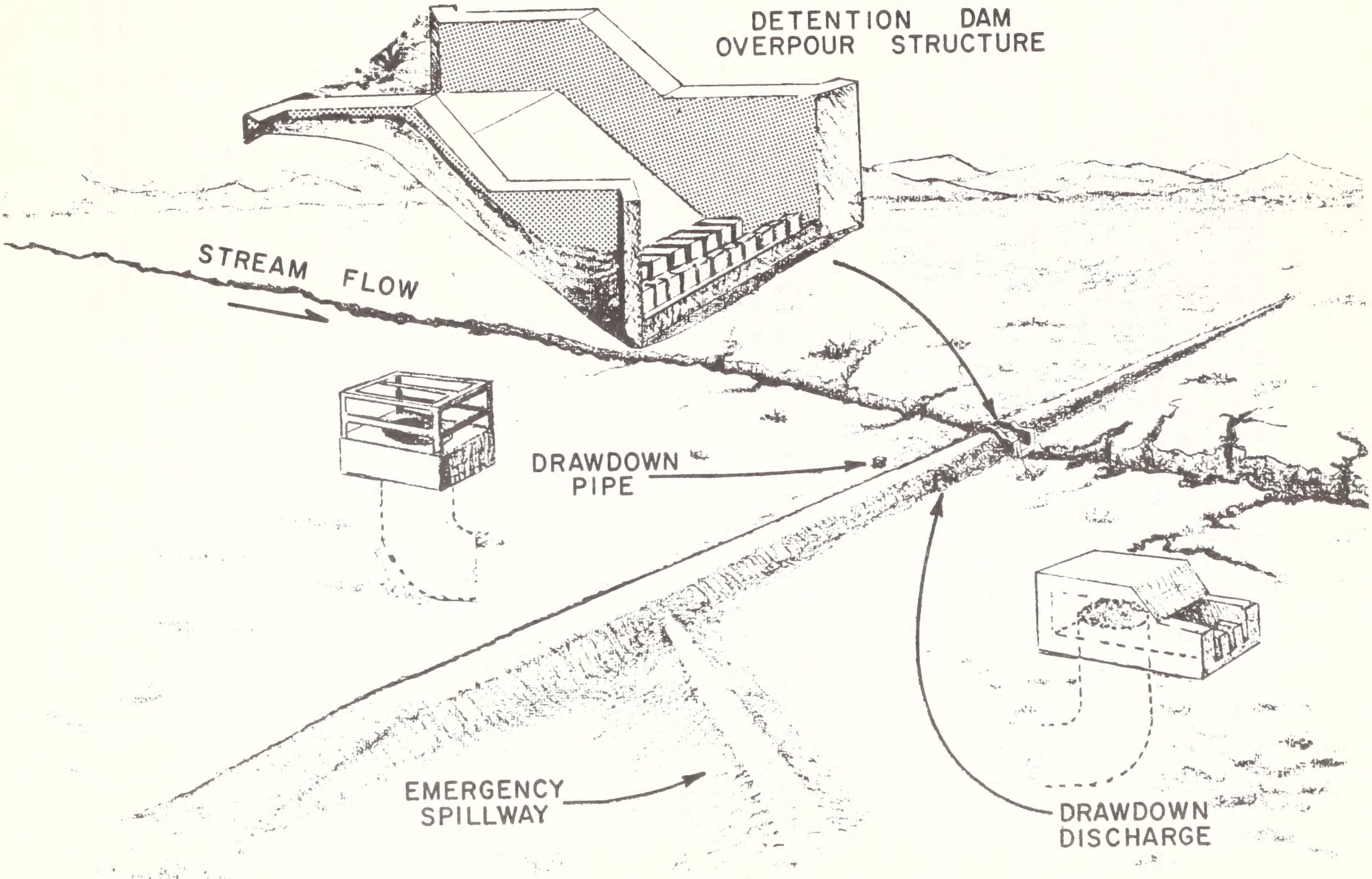


Figure 1-9 Typical Detention Dam

These three detention dams would fill and regrade the lower San Simon channel upstream to the existing San Simon Fan detention dam, resulting in the restoration of the lower 30 miles of the San Simon River. This restoration would establish 4,000 acres of dense, heavy growths of grassland and riparian vegetation. These dams would function in conjunction with a number of existing erosion control and sediment retention structures located upstream on major tributaries, as well as the Fan detention dam on the San Simon Channel.

Construction would temporarily disturb approximately 100 acres of surface from fill material borrow pits, site clearing, and a small amount of road construction. Fifty surface acres would be permanently disturbed. Access to the construction sites would be provided by existing roads. The three structures would require approximately 600,000 cubic yards of earth-fill material, 600 cubic yards of concrete, and 1,000 tons of steel.

Primitive Roads and Trails

In the construction and maintenance of the proposed range improvements approximately 300 miles of primitive roads and trails would be needed for access. An estimated 200 miles of these roads would not require blading; rubber-tired vehicles would create two-track trails, which would be reused from time to time for range improvement maintenance. These two-track roads would disturb approximately 75 acres of soil and vegetation in 3-foot sections of varying lengths. An estimated 100 miles of bladed road would be required where slopes or vegetation make the terrain impassable by rubber-tired vehicles. Bladed roads would disturb 12-foot wide swaths of land totaling 150 acres. Because their exact locations have not been determined, proposed roads and trails do not appear on the map of existing and proposed range improvements (plate 2).

Steps in Implementing the Proposed Action

If, after the final ES has been filed, BLM decides to implement the proposed action, the first step in its implementation would be adjusting livestock use to the carrying capacity of the range. All adjustments would be initiated over a 3-year period. The priorities for the adjustment phase will be as follows:

a) Ephemeral range areas;
b) Grazing units having existing range study data--trend, utilization and actual use--or applicable information such as exclosures or other agency range studies that can be used to support the proposed use adjustment;
c) Grazing units having recent range surveys that can be rechecked;
d) Grazing units having critical forage use conflicts or where resource damage is occurring;
e) All other allotments.

The intensive grazing management systems described in each AMP would be implemented at the rate of four or five per year over a 15-year period. Livestock use would be deferred concurrently with the implementation of the AMPs for the grazing units involved.

Critical watershed and wildlife habitat areas would receive highest priority for implementation, followed by other areas on the basis of resource problems and opportunities. Range improvements would be constructed as provided in the proposed AMPs. The three proposed detention dams would be constructed as soon as funds become available. In general, the following measures would be required to implement the components of the proposed action:

(1) Adjustment of licensed livestock use to balance with the grazing capacity.
(2) Implementation of the proposed management system, including the construction of range improvements.
(3) Follow-up: range use supervision, range studies, multi-resource monitoring, inventory, and evaluation as discussed in the intensive grazing management section of this chapter.

In the follow-up actions, each grazing unit will be studied and the validity of existing information determined. These studies will take the form of AMP supervision and allotment evaluation prescribed by BLM Manual 4422 and 4413. These studies include climatic effect, actual use, utilization, and key area studies--range trend, and soil surface factor transects. Other resource studies as appropriate will also be conducted. Results of these studies will be summarized and evaluated at the end of each grazing cycle. The data will then be used to assess progress toward achieving AMP objectives and to recommend adjustments in the grazing system or stocking rate as required.

Benefit/Cost Analyses

Benefit/cost (B/C) analyses were conducted on 69 new and revised AMPs but not on implemented AMPs or those having no improvements proposed. The analyses considered all improvement, replacement, and operation and maintenance costs for a 50-year period, benefits to wildlife, recreation, and watershed, and benefits resulting from increases expected in livestock forage, calf crops, calf weaning weights, and decreases in death losses. The analyses did not include unquantifiable benefits, such as those to nongame wildlife species. The complete B/C analyses are available for review at the Safford District office.

TABLE 1-4
BENEFIT/COST ANALYSES

Benefit to Cost Ratio	Grazing Units			Net Capital Investment				Average
	Number	% of Total	Average B/C Ratio	Dollars	% BLM	% Ranchers	% Total Costs*	Cost per AUM**
Less than 0.5:1	10	14.5	.35:1	282,972	91.2	8.8	26.1	$72.00
Between 0.5:1 and 1:1	27	39.1	.73:1	488,646	72.0	28.0	49.9	28.00
Between 1:1 and 2:1	13	18.8	1.64.1	79,620	79.0	21.0	10.2	13.00
Greater than 2:1	19	27.6	6.85:1	118,025	94.1	5.9	14.8	5.00
Total	69	100.0	1.63:1	969,263	80.9	19.1	100.0	$16.00

*Total cost includes capital investment, maintenance, and replacement costs.
**Average cost is computed on the basis of total AUMs rather than increase.
NOTE: Minor revisions were made in the analyses and are reflected in the above table.

INTERRELATIONSHIPS

BLM Planning System

Since 1968 BLM has developed a bureauwide planning system designed to inventory and analyze the existing situation by delineated planning units in each District. The first phase of the planning system is the development of a Unit Resource Analysis (URA). These URAs include a total resource assessment broken down by separate resource disciplines. (See BLM Manual 1600 for a complete description of the planning system.) The second phase of the planning system is the development of Management Framework Plans (MFPs). MFPs are developed after the URAs are completed and consist of decisions for uses of various resources found in each planning unit.

Four planning units lie within the ES area. The dates of completion of their URAs and MFPs are as follows:

	URA	MFP
San Simon	12-31-72	8-3-73
Black Hills	4-12-74	8-12-75
Winkelman	2-26-74	5-27-75
Geronimo	12-31-72	8-3-73

The planning unit boundaries are shown on map 1-2. This ES is written specifically on the proposed action of grazing livestock under the provisions of prepared Allotment Management Plans (AMPs) that have been developed in compliance with MFP decisions.

The Safford District has completed MFPs covering the entire ES area, in accordance with the BLM multiple-use planning system. These MFPs establish the following districtwide management objectives and constraints that may affect livestock grazing;

(1) Develop AMPs or grazing systems that help stabilize and improve the quality and increase the quantity of the vegetation community, thereby meeting the various resource needs; provide management facilities and livestock waters as necessary to implement grazing systems;

(2) For any projects in which seedings, erosion control structures, or land treatment are deemed necessary as a result of activity planning, construct such projects to consider fully scenic values, recreation, wildlife, and watershed needs;

(3) Conduct intensive cultural, historical, and paleontological site inventories and analyses on public lands to protect significant sites from destruction until goals can be identified and proper management implemented;

(4) Improve water availability to wildlife yearlong; provide water for all large and small mammals and birds at existing developments and at all future developments;

(5) Protect desert wash and riparian type habitat from excessive and incompatible pressures and surface disturbances and otherwise enhance their environmental integrity.

In addition, each individual MFP establishes constraints and management objectives for a particular planning unit. MFP recommendations and decisions are thus followed during AMP formulation. Table 1-4 shows MFP recommendations, conflicts, and decisions affecting the proposed action.

Relationships with Existing or Proposed Projects, Plans, or Policies

BLM policies dictate that strict management controls based on the multiple use of resources be enforced on public lands. Administering over 57 percent of the total land within the ES area, BLM essentially controls the extent of grazing on much of the private and State-owned land.

The Soil Conservation Service (SCS)-BLM cooperative agreement is designed to create continued cooperation and close working relations between BLM and SCS. SCS and BLM use different methods of inventory and capacity classification of a range. SCS writes AMPs, when requested by the land user, in areas where private or State leased land predominates. These areas often include small acreages or scattered parcels of public lands. BLM formulates AMPs for allotments having a majority of public lands. These are called coordinated plans.

The U.S. Forest Service administers grazing allotments next to the ES area boundary. Several BLM allottees also have Forest Service grazing allotments and rotate the same cattle on national forests and public lands. The two agencies have developed some coordinated AMPs. A need exists, however, for close cooperation and coordination in developing additional coordinated AMPs. Forest service roadless areas currently under study that are adjacent to public lands are identified on map 2-21.

The Arizona State Land Department, with control of almost 30 percent of the land in the ES area, could also have some impact on the proposal. BLM and the Land Department use entirely different methods of determining grazing capacity. Revenue production is the State's primary obligation in the use of State land. The Arizona State Legislature recently passed the Cooperative Allotment Management Studies Bill. This bill prohibits the Land Department from adopting final management plans involving the reduction of use until the plans are reviewed by a joint committee of the State Legislature.

TABLE 1-5

MFP RECOMMENDATIONS AND DECISIONS AFFECTING THE PROPOSED ACTION

Livestock MFP-1	Other Resources MFP-1 (Resource Recommendations)	MFP-2 (Conflicts)	MFP-3 (Decisions)	Resource Trade-offs
	Wildlife			
view and revise exist- AMP s. Develop AMP s grazing systems for t of grazing units. ovide management facil- ies as needed for imple- ntation.	Fence spring areas (3 acres minimum) to exclude livestock.	Unrestricted livestock use damages or destroys springs, restricting availability of water for wildlife.	Protect and improve cover at watering sites--one technique may involve fencing.	Unquantified number of acres eliminated from grazing.
	Terminate grazing along Gila River bottom land, portions of Eagle and Bonita Creeks, and San Francisco River.	Continued livestock use is detrimental to riparian vegetation.	Allow livestock use only when needed for vegetation control.	Unquantified number of acres eliminated from grazing.
	Recreation			
	Remove or restore existing scenic intrusions, including livestock grazing and improvements along Gila and lower San Francisco River.	River sections to be nominated for wild and scenic river status. Grazing use would detract from scenic quality.	Allow livestock use only when needed for vegetation control.	Unquantified number of acres eliminated from grazing.
	Retain primitive characteristics through restriction of further development in Gila River buffer zone.	Visual impacts detract from primitive values.	Livestock improvement restrictions applicable only to canyon bottoms.	Visual impacts to continue.
	Prohibit future and existing livestock developments (extent feasible) in Coronado Mountains area.	Developments conflict with primitive values.	Manage under primitive scenic character guidelines. Hands off, low investment approach.	Limited management capability.
	Watershed			
	Eliminate impact of domestic livestock grazing on watershed vegetation covers in Geronimo Planning Unit.	Overgrazing has created accelerated erosion.	Revise grazing system.	Continued erosion but at reduced rate.
	Wildlife			
	Terminate livestock grazing in Aravaipa Canyon.	Grazing conflicts with natural reproduction of desirable species for wildlife.	Wildlife recommendations modified to allow grazing if needed for vegetation control.	Loss of approximately 24 AUMs annually.
	Terminate livestock grazing along Mescal Creek.	Grazing conflicts with riparian habitat.	Livestock recommendation accepted.	Continued but reduced competition between livestock and wildlife for riparian vegetation.

Livestock MFP-1	Other Resources MFP-1 (Resource Recommendations)	MFP-2 (Conflicts)	MFP-3 (Decisions)	Resource Trade-offs
	Recreation			
	End livestock grazing in Aravaipa Canyon.	Grazing detracts from primitive values.	Recreation recommendation changed to allow grazing if needed for vegetation control.	Loss of approximately 24 AUMs annually.
	Remove or restore existing scenic intrusions, including livestock grazing and improvements along Gila River below Coolidge Dam.	Grazing and improvements conflict with natural and scenic values.	Livestock recommendation accepted.	Loss of aesthetic quality.
	Exclude grazing from Little Doubtful, Dos Cabezas, Howell Canyon, and Government Peak.	These areas to be designated as natural areas.	Designations deferred until pending studies completed.	Continued grazing use for an undetermined length of time.
	Potential designation of Peloncillo, Doubtful Canyon, Dos Cabezas-Chiricahua Mountains, and Whitlock Mountains as primitive areas.	Access, and livestock developments would be restricted.	Peloncillo, Dos Cabezas, and Chiricahua Mountains to have limited developments. Access routes to be closed and rehabilitated.	Restrict type of grazing systems.
Manipulate vegetation in specified areas to increase forage production generally confined to lower elevations.	Disallow any proposals that disturb objects of antiquities in Bear Springs Flat Paleontological Area.	Vegetation manipulation practices could destroy sites.	Recreation recommendation accepted.	Approximately 4 square miles of land would not be treated, slightly reducing forage value. (Proposed AMP's do not include vegetation manipulation practices.)
	Restrict practices affecting scenic areas, buffer zones, or natural areas, including mechanical land treatments.	Visual impacts would detract from scenic values.	Recreation recommendation accepted.	Unquantified - specifics not identified. Possible loss of potential forage values.

The Arizona Game and Fish Commission (AG&FC) controls the level of hunting game animals by determining the number of permits issued for major game species. Statewide projections for hunting permits forecast a 47 percent increase from 165,448 permits issued in 1974 to 242,504 in 1990 (Arizona Game and Fish Department, 1975b). Some improvements have been accomplished in the establishing of catchments throughout the ES area. In 1976 AG&FD completed a planning pilot study in Wildlife Management Unit 37B, which includes a portion of the ES area. Moreover, AG&FD is presently formulating similar management plans, which will ultimately affect all of the ES area. Many of the plan's components require close cooperation with BLM.

The New Mexico State Land Office leases livestock forage (not land) on State lands on a competitive bid basis for a 5-year period. Lessees have preference rights but can be outbid by other applicants. They can thus lose their leases if they do not meet the high bid. The New Mexico State Land Office sets carrying capacities for the State lease lands. Contacts between BLM and the State Land Office are minimal. Currently no program exists for cooperatively managing an allotment with intermingled State lands and public lands. BLM usually works directly with the rancher, since he is the lessee on the State lands and he controls livestock grazing on those lands.

The individual allottee has been consulted in the past and is now consulted on the formulation of new AMPs. In the past a close working relationship has often developed between BLM personnel and the allottee. In general, if the allottee approves of improved livestock management and protection of natural resources and is favorable to the AMP, the AMP works. A lack of cooperation between the allottee and BLM, however, hinders carrying out the provisions of the AMP.

CHAPTER 2

DESCRIPTION OF THE ENVIRONMENT

CHAPTER 2

DESCRIPTION OF THE ENVIRONMENT

Chapter 2 discusses only the environmental components that affect or would be affected by the proposed action. This chapter thus omits most discussion of studies or methodologies used to obtain environmental data.

EXISTING ENVIRONMENT

Climate

Temperature

The ES area records high temperatures during the summer months, but only Clifton has an average daily maximum temperature above 100° F. The warmest readings usually occur at the northern end of the San Simon Valley. Record high temperatures are generally between 110° and 115° F. Above 8,000 feet in the Pinaleno and Chiricahua Mountains afternoon temperatures rarely rise above 85° F., and night temperatures in the low 50's are common.

The warmest weather usually occurs during the last week of June and the first two weeks of July. During this period before the onset of summer rains, the air is exceptionally dry and the skies clear, permitting intense heating of the earth's surface during the day.

The spring and fall months have little precipitation, clear skies, and large daily temperature ranges. In the late winter and spring, temperatures may vary 40 degrees or more during the day from an early minimum in the low 40's to an afternoon maximum in the 80's.

Average winter temperatures for the valley floor and slope areas range from 45° to 55° F, with freezing nighttime temperatures occurring between October and April.

Precipitation

During two periods of the year precipitation is especially common in the ES area. The summer rainy season (July and August) brings moisture almost entirely from the Gulf of Mexico, with showers that start abruptly, continue intermittently, and finally taper off. The second wet period extends from December through the middle of March and is believed to be controlled by air from the Pacific Ocean. During this season, rainfall is gentle, and lasts for several days. The area's average annual precipitation is estimated at 14.44 inches, 65 percent of which occurs from May to October. The ES area's average annual precipitation ranges from about 7 inches in the lower valleys to more than 25 inches in small areas, including the highest peaks in the Pinaleno and Chiricahua Mountains. Figure 2-1 displays the annual variation in average relative humidity, monthly precipitation, and precipitation intensity in southeast Arizona.

Topography

The ES area lies within the basin and range physiographic province about 1 to 60 miles south of the Colorado Plateau. The area's northwesterly trending mountain ranges reach elevations of over 10,000 feet and are separated by broad, flat or gently sloping basins. The Gila Mountains and the area near Clifton and Morenci represent the transition zone between the Colorado Plateau and the basin and range province. These areas were shaped by drainage influences from the plateau.

Physiographically the area is divisible into eight distinct units shown in map 2-1: (1) Animas Valley, (2) Peloncillo Mountains, (3) San Simon Valley, (4) Pinaleno, Dos Cabezas, and Chiricahua Mountains, (5) Galiuro Mountains, (6) Aravaipa Valley, (7) San Pedro Valley, and (8) Gila Valley.

Geology

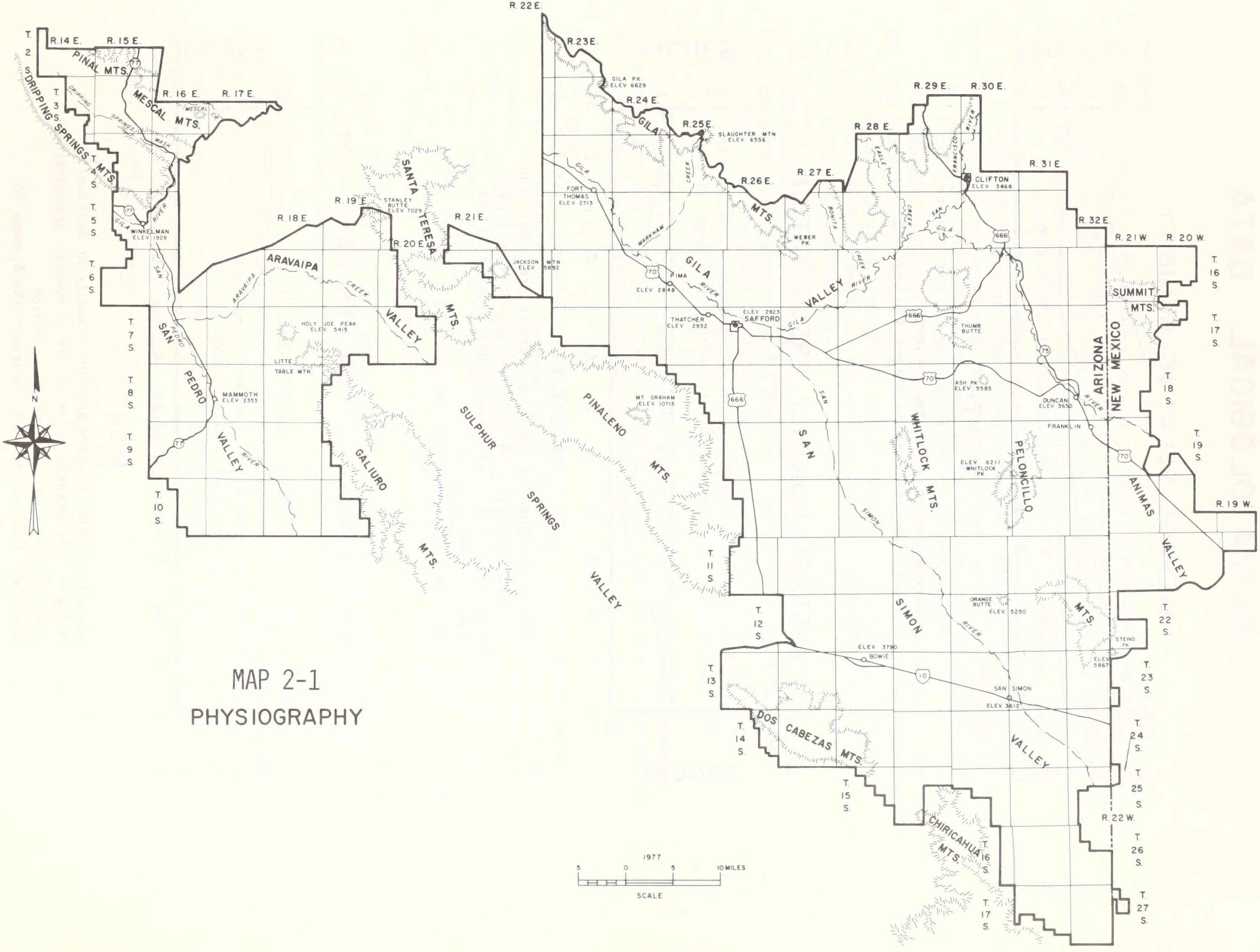
The ES area is underlain by an extensive sequence of rocks, ranging in age from early Precambrian (approximately 1.8 billion years) to Holocene (recent). Many of these rocks are bedded and are of sedimentary, volcanic, or metamorphic origin. Some were intruded by masses of granitic type rocks and smaller masses of prophyry that form the basis for the present day copper deposits.

These rocks were deformed during two periods of mountain building and were mildly deformed during intervening and later times. A period of deformation called the basin and range disturbance began about 30 million years ago and has continued periodically to fairly recent times. During this period most of the present ranges were uplifted by faulting.

This uplifting was followed by heavy erosion of the mountains, the material from which accumulated in the valleys. Renewed downcutting of the streams occurred during relatively recent times to form the abrupt small canyons of the present.

Soils

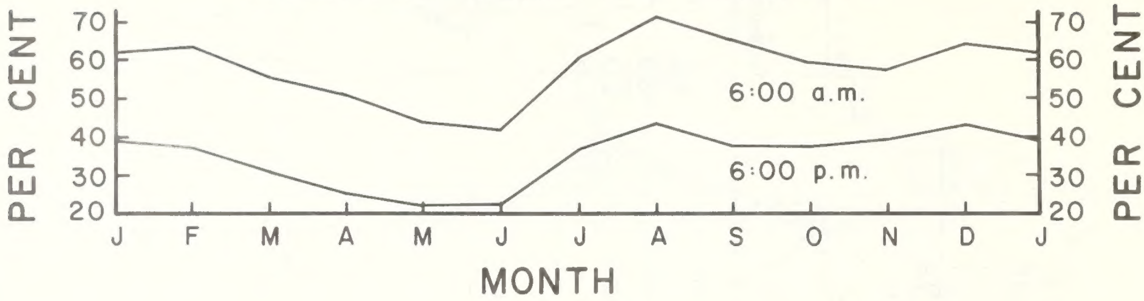
The soil of the ES area will be discussed as soil associations, groups of defined and named taxonomic soil units occurring together in an individual and characteristic pattern over a geographic region. Soil associations in many ways are comparable to plant associations. Soil associations are used on reconnaissance or generalized soil maps in which two or more defined taxonomic units occurring together in a characteristic pattern are combined because the map's scale or purpose does not require delineation of individual soils.



MAP 2-1
PHYSIOGRAPHY

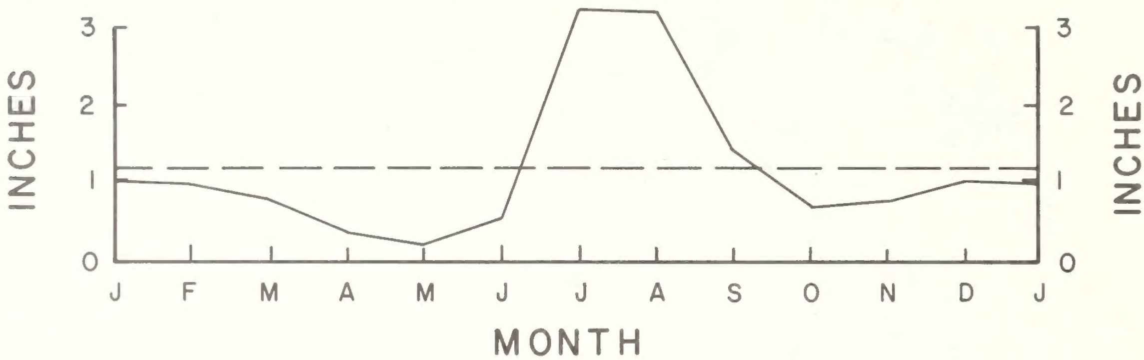
CLIMATOLOGICAL DATA

AVERAGE RELATIVE HUMIDITY



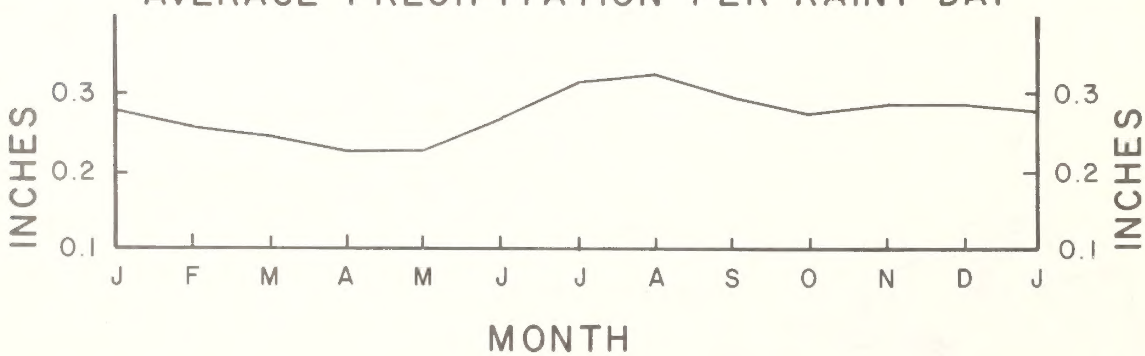
Annual variation of the mean 6:00 a.m. and 6:00 p.m. relative humidities in Southeast Arizona.
Modified from Green and Sellers — 1964, page 33.

AVERAGE MONTHLY PRECIPITATION



Annual variation of the mean monthly precipitation in Southeast Arizona. The horizontal dashed line superimposed on the curve indicates the average of the twelve monthly values.
Modified from Green and Sellers — 1964, page 10.

AVERAGE PRECIPITATION PER RAINY DAY



Annual variation of percipitation intensity in Southeast Arizona. The intensity is expressed in average precipitation per day with 0.01 inch of precipitation
Modified from Green and Sellers — 1964, page 10.

Figure 2-1

Soils found in the ES area may be grouped in two ways: (1) by mean annual soil temperature at a depth of 20 inches, and (2) by mean annual precipitation received. The soil temperature classes found in the ES area are Thermic and Mesic. Thermic soils have a mean annual soil temperature at a depth of 20 inches of 59° F to 72° F, whereas the mean annual soil temperature at 20 inches for Mesic soils ranges from 47° F to 59° F. The two moisture classes of soils occurring in the ES area are (1) Semiarid--receiving 10 to 15 inches mean annual precipitation--and (2) Subhumid--receiving more than 16 inches mean annual precipitation.

The Thermic Semiarid soils make up approximately 93 percent of the ES area and Mesic Subhumid soils 7 percent. Thermic soils occur below 5,500 feet in elevation, and Mesic soils occur above 5,500. In the ES area, 13 soil associations are classed as Thermic Semiarid, and 1 is classed as Mesic Subhumid.

The soil associations presented in table 2-1 and map 2-2 were taken from an unpublished supplement to Arizona General Soil Map (U.S. Department of Agriculture, Soil Conservation Service (SCS), 1975). Some of the soil association descriptions were updated and adapted to the ES area from recent soil inventories conducted by the SCS for BLM.

The general soil map presented in table 2-1 is adequate for general planning purposes only and is not suitable for a grazing unit by grazing unit analysis of important soil properties.

Problem Areas

The Glendale-Gila-Bluepoint Association (TS1) and the Grabe-Pima-Anthony Association (TS2), comprising 204,744 acres, generally have high soil surface factors and sparse vegetation. These two associations are the major contributors of airborne dust during periods of high wind movement. These soils are sodium affected in some small areas and are therefore susceptible to wind erosion since the presence of sodium disperses the soil particles. This dispersion allows lower velocity winds to move soil particles into the air.

These associations are generally in a critical or severe erosion condition class and are producing much below their climax vegetation. They lie along the San Simon and Gila Rivers and other major drainages.

The Pinaleno, Nickel, and Cave soil series (TS9, TS12, TS14), comprising 305,714 acres, are protected from wind and water erosion by either a desert pavement or by hardpan fragments on the surface. If these surface coverings are undisturbed, little erosion results. The removal of the surface protection, however, leaves these soils highly susceptible to wind and water erosion. Vehicle use and livestock movement can destroy the surface enough to allow sheet and rill erosion as well as gully formation.

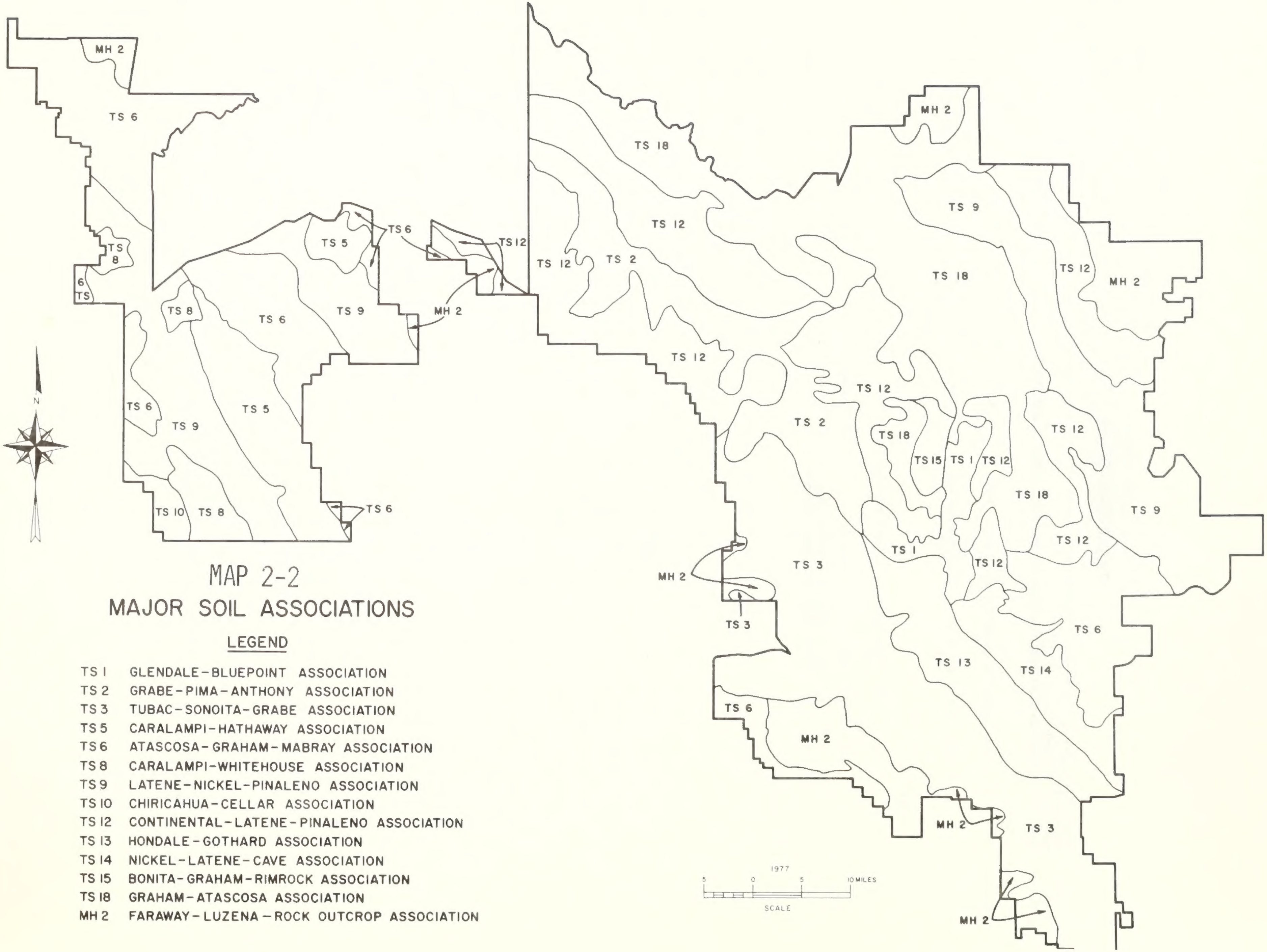
TABLE 2-1
SOIL INTERPRETATIONS

Soil Assoc. and Percent in ES Area	Acreage in Each Soil Assoc.	Percent Slope	Depth	Profile Texture*	Importance Feature	Permeability	Hydrologic Group	Erosion Hazard	Available Water Capacity	Potential for Range	Percent Soil Assoc.
TS1 - 1.5%	42,071										
Glendale		0-2	60"	Lo over Cl Lo	Stratified, subject to occasional flood	Moderately slow	C	H_2O-High	High	High	25%
Gila		0-2	60"	Lo over Lo	Subject to occasional flooding	Moderate	B	High Water	High	High	20%
Bluepoint		0-5	60"	Ly Fs over	Sandy	Rapid	A	High Wind	Low	Low	40%
TS2 - 5.8%	162,673										
Grabe		0-2	60"	Loam	Stratified	Moderate	B	High Water	High	High	25%
Pima		0-1	60"	Clay loam	Stratified	Moderately slow	C	High Water	High	High	25%
Anthony		0-3	60"	Sandy loam	Stratified	Moderately rapid	B	High H_2O Med. Wind	Moder-ate	Medium to Low	25%
TS3 - 14.3%	401,074										
Tubac		2-8	60"	Sy Lo over Cl	Clayey	Slow	C	Medium	High	Medium	35%
Sonoita		0-3	60"	Gr Sy Lo over Sy Cl Lo	Gravelly	Moderate	B	Medium	Moder-ate	Low	20%
Grabe		0-2	60"	Loam	Stratified	Moderate	B	High Water	Moder-ate	High	20%
TS5 - 4.2%	47,798										
Caralampi		5-25	60"	VGr Sy Lo over VGr Cl Lo	Gravelly-Slope	Moderate	B	Low	Moder-ate	Medium	45%
Hathaway		5-30	60"	Gr Lo over VGr Sy Lo	High Lime-Gravelly Slope	Moderate	B	Medium	Moder-ate	Low to Medium	35%
TS6 - 11.8%	330,956										
Atascosa		15-70	4-20"	VGr Lo over Br	Gravelly-Depth-Slope	Moderate	D	Medium	High	Medium	30%
Graham		15-70	8-20"	VGr Cl over Br	Clayey-Depth to Bed-rock Shrink-Well Slope	Slow	D	Medium	Moder-ate	Low to Medium	25%
Mabray		15-70	4-20"	VCo Lo over Br	Depth-High Lime Slope	Moderate	D	Medium	Low	High	25%
TS8 - 2.0%	56,094										
Caralampi		5-25	60"	VGr Sy Lo over VGr Cl Lo	Gravelly-Slope	Moderate	B	Low	Moder-ate	Medium	65%
White House		5-15	60"	Gr Lo over Cl	Clayey	Slow	C	Low	High	Medium	20%
TS9 - 13.4%	375,831										
Latene		5-15	60"	Loam	High Lime	Moderate	B	Medium	High	Low	30%
Nickel		5-15	60"	VGr Sy Lo	High Lime-Stratified	Moderately slow	B	Medium	Moder-ate	Low	20%
Pinaleno		5-15	60"	VGr Sy Lo over VGr Sy Cl Lo	Gravelly-Desert Pavement	Moderately slow	C	Low	Moder-ate	Low	20%

TABLE 2-1 (cont.)

Soil Assoc. and Percent in ES Area	Acreage in Each Soil Assoc.	Percent Slope	Depth	Profile Texture*	Importance Feature	Permeability	Hydrologic Group	Erosion Hazard	Available Water Capacity	Potential for Range	Percent Soil Assoc.
TS10 - 0.9%	25,242										
Chiricahua		15-60	20-30"	Gr Lo over Gr Cl over Br	Depth to Rock	Slow	D	Medium	Moderate	Low to Medium	50%
Cellar		25-70	4-20"	VGr Sy Lo over Br	Slope-Depth to Rock	Moderate	D	Medium	Low	Low to Medium	30%
TS12 - 17.1%	479,607										
Continental		2-10	60"	Gr Sy Lo over GrCl	Clayey and Gravelly	Slow	C	Medium	High	Low to Medium	30%
Latene		5-15	60"	Loam	High Loam	Moderate	B	Medium	High	Low	25%
Pinaleno		5-15	60"	VGr Sy Lo over VGr Sy Cl Lo	Gravelly-Slope Desert Pavement	Moderately slow	C	Low	Low	Low	25%
TS13 - 4.1%	114,993										
Hondale		0-2	60"	Lo over Cl	High Lime-Alkali	Very slow	D	High	Moderate	Medium	40%
Gothard		0-5	60"	Fs Lo over Cl Lo	Saline-Alkali Drainage	Very slow	D	High	High	Medium	35%
TS14 - 2.3%	64,508										
Nickel		5-15	60"	VGr Sy Lo	High Lime-Gravelly Slope	Moderately slow	B	Medium	Moderate	Low	35%
Latene		5-15	60"	Loam	High Lime	Moderate	B	Medium	Moderate	Low	30%
Cave		3-8	4-20"	Gr Sy Lo over Gr Lo over Hardpan	Depth-High Lime	Moderate	C	Medium	Low	Low	20%
TS15 - 0.6%	16,828										
Bonita		3-10	60"	Co Si Cl Lo over Si Cl	Clayey-Shrink-Swell	Very Slow	D	Medium	High	Medium	30%
Graham		15-70	8-20"	VGr Cl over Br	Clayey-Depth-Slope	Slow	D	Medium	Moderate	Low to Medium	20%
Rimrock		15-70	20-60"	Co Cl over Cl over Br	Clayey-Depth	Very Slow	D	Medium	High	Medium	20%
TS18 - 15.4%	431,926										
Graham		15-70	4-20"	Gr Clay over Br	Clayey-Depth-Slope	Slow	D	Medium	Medium	Low to Medium	40%
Atascosa		15-70	4-20"	VGr Lo over Br	Gravelly-Depth-Slope	Moderate	D	Medium	High	Medium	40%
MH2 - 6.6%	185,111										
Faraway		15-70	5-20"	VGr Lo over Br	Depth-Slope	Moderate	D	Medium	Moderate	Medium	50%
Luzena		15-70	7-20"	Co Lo over Co Cl over Br	Depth-Slope	Slow	D	Medium	Moderate	Medium	20%

*Br- bedrock, Cl- clay, Cly- clayey, Co- cobbly, Fs- fine sand, Gr- gravelly, Hl- high lime, Li- lime, Lo- loam, Ly- loamy, Sa- sand, Si- silty, So- stoney, St- stratified, Sy- sandy, V- very.



MAP 2-2

MAJOR SOIL ASSOCIATIONS

LEGEND

TS 1	GLENDALE-BLUEPOINT ASSOCIATION
TS 2	GRABE-PIMA-ANTHONY ASSOCIATION
TS 3	TUBAC-SONOITA-GRABE ASSOCIATION
TS 5	CARALAMPI-HATHAWAY ASSOCIATION
TS 6	ATASCOSA-GRAHAM-MABRAY ASSOCIATION
TS 8	CARALAMPI-WHITEHOUSE ASSOCIATION
TS 9	LATENE-NICKEL-PINALENO ASSOCIATION
TS 10	CHIRICAHUA-CELLAR ASSOCIATION
TS 12	CONTINENTAL-LATENE-PINALENO ASSOCIATION
TS 13	HONDALE-GOTHARD ASSOCIATION
TS 14	NICKEL-LATENE-CAVE ASSOCIATION
TS 15	BONITA-GRAHAM-RIMROCK ASSOCIATION
TS 18	GRAHAM-ATASCOSA ASSOCIATION
MH 2	FARAWAY-LUZENA-ROCK OUTCROP ASSOCIATION

The erosion condition class is a measure of an area's present state of erosion. The erosion hazard, as shown for each soil series in table 2-1, is an estimate of the susceptibility or potential of a soil to erode.

Phase I of BLM's Watershed Conservation and Development Inventory identified several areas in a critical or severe erosion condition class. These areas lie (1) along the San Simon River and major tributaries in grazing units 46, 47, 48, 51, 52, 53, 54, 55, 56, 57, 58, 59, 61, 62, 64, 66, 67, 73, 74, 75, 76, 84, 92, 101, 104, 105 and 110, comprising 212,072 acres or 7.6 percent of the ES area; (2) in the Hunter Flat area and along major tributaries of the Gila River near Duncan in grazing units 14, 28, 35, 36, 38, 39, 40, and 43, comprising 18,770 acres or 0.6 percent of the ES area; and (3) in the Bear Springs Flat and Black Rock Wash areas on tributaries of the Gila River between Safford and Fort Thomas in grazing units 162, 169, 170, 171, 172, 174, 175, 176, 183, 184, 185, 186, 187, 188, 190, 192, 193, comprising 34,145 acres or 1.22 percent of the ES area.

Present in areas of critical or severe erosion are the Glendale, Gila, Bluepoint, Grabe, Pima, and Anthony soil series. All of these series occupy bottoms or first terrace positions on the landscape and generally receive runoff from other areas. Table 2-2 shows the acreage of erosion condition classes within the ES area. See map 1-3 and appendixes B and D.

TABLE 2-2
ACREAGE OF EROSION CONDITION CLASSES

Erosion Condition	Acreage	% of ES Area
High*	264,787	9.4
Moderate	886,625	31.6
Low**	1,194,650	42.6
Not in allotment boundaries (unclassified)	458,650	16.4
Total	2,804,712	100.0

*Critical and severe were included in the high class.
**Stable and low were included in the low class.

Source: Phase I Watershed Conservation and Development Inventories in each Safford District Unit Resource Analysis.

The most critical erosion present in the ES area lies along the San Simon River in Soil Association TS1. This area has been identified since the 1930s as one of the worst examples of erosion in the United States. The soil surface factor approaches 100 in many areas.

Sediment Yield

The sediment yield for the ES area was calculated using a BLM Denver Service Center adaptation of the Pacific Southwest Inter-Agency Committee (1968) method. This sediment yield was estimated by grazing unit and is summarized in appendix A. A total of 2,330 acre-feet of sediment is moved each year on the 2,346,062 acres of the ES area administered in BLM grazing allotments. (The total ES area includes 2,804,712 acres.)

Water Resources

The ES area contains the following perennial streams: Gila River, San Francisco River, Eagle Creek, Bonita Creek, Mescal Creek, and Aravaipa Creek (see plate 1). The entire ES area is drained by the Gila River with the exception of a small area on the south side of the Dos Cabezas Mountains from which water flows into Willcox Playa. The average annual streamflow of major perennial waters in the ES area is shown in table 2-3.

TABLE 2-3
STREAMFLOW OF MAJOR PERENNIAL WATERS

Stream	Measurement Location	Average Annual Streamflow (in acre-feet)
Gila River	Calva	119,800
Gila River	Kelvin	167,100
San Francisco River	Clifton	96,100
Eagle Creek	Pumping Station near Morenci	24,800
Bonita Creek	No Data Available	
Mescal Creek	No Data Available	
Aravaipa Creek	No Data Available	

Source: Arizona Interstate Stream Commission, 1967

In addition to perennial streams, the ES area contains innumerable ephemeral or intermittent streams that flow primarily after high-intensity thunderstorms. These streams usually flow continuously for only a matter of days. Average annual streamflow for the San Simon River near Solomon and the San Pedro River near Winkelman amounts to 11,300 and 40,000 acre-feet respectively (Arizona Interstate Stream Commission, 1967).

Vegetation

General

In the hot, semiarid environment of the ES area, plants initiate growth whenever moisture is available and temperatures are favorable. Moisture is the most limiting factor for plant growth in the area. Temperatures, except at the highest elevations, are suitable for some plant growth almost yearlong. Phenology data for key grass and shrub species in the ES area are shown in tables 2-4 and 2-5.

Most plants are dormant or almost dormant during May and June, which is the usual summer dry period. During the late summer rainy period--July, August and early September--a substantial portion of plant growth occurs. About 90 percent of the year's total warm-season grass growth occurs during this rainy season (Martin, 1975). About 10 percent of the warm-season grass growth occurs during March and April.

A warm-season plant is one whose growth period or major portion thereof occurs during the spring, summer, or fall and one that is usually dormant in the winter. A cool-season plant is one whose major growth period occurs during the winter and early spring. Most of the perennial grass species that produce major amounts of forage for livestock and wildlife are warm-season grasses. The perennial cool-season grasses make up a small portion by weight of the total composition of the plant community in any of the range sites in the ES area. Some of these cool-season grasses, such as Junegrass and slim tridens, however, have been observed flowering in the field in the summer, suggesting that some of the perennial grasses previously thought of as cool-season species take advantage of soil moisture conditions regardless of the time of year.

Warm-season grasses typically initiate growth and produce some green leaves in March and April, are dormant in May and June, initiate growth with the advent of summer rains in July, produce seed between August and October, and return to dormancy from November through February. This phenology of a warm-season grass is general since the specific months of growth initiation, flowering, or seed ripe are highly variable. In the ES area the amount and timing of precipitation is the single most important variable in a plant's growth process.

TABLE 2-4
PHENOLOGY OF KEY GRASS SPECIES OF UPPER GILA-SAN SIMON ES AREA

Grass Species	Growth Initiation	Begin Flowering	Seed Ripe	Seed Dissemenation	Reproduction Seeds	Reproduction Rhizomes	Reproduction Stolons
Cane beardgrass *Andropogon barbinodis*	7/01-- 9/15	7/20--10/05	8/15--10/30	9/01--11/15	X		
Sideoats grama *Bouteloua curtipendula*	7/01-- 9/15	7/15-- 9/30	8/15--10/30	9/01--11/15	X	X	
Black grama *Bouteloua eriopoda*	7/01-- 9/15	7/15-- 9/30	8/05--10/20	8/20--11/05			X
Blue grama *Bouteloua gracilis*	7/01-- 8/30	7/20-- 9/20	8/20--10/20	9/05--11/05	X	X	
Hairy grama *Bouteloua hirsuta*	7/01-- 8/20	8/01-- 9/20	9/01--10/20	9/15--11/05	X	X	
Rothrock grama *Bouteloua rothrockii*	7/01-- 9/15	7/15-- 9/30	8/05--10/20	8/20--11/05	X		
Bermuda grass *Cynodon dactylon*	3/01	3/20	4/20	5/05	X	X	X
Plains lovegrass *Eragrostis intermedia*	11/15	2/15-- 3/10	3/15-- 4/10	4/05-- 4/30	X		
Lehman lovegrass *Eragrostis lehmanniana*	7/01-- 9/15	7/20--10/05	8/15--10/30	9/01--11/15	X		
Curly mesquite *Hilaria belangeri*	7/01-- 8/30	8/01-- 9/20	9/01--10/20	9/15--11/15	X		X
Tobosa *Hilaria mutica*	7/01-- 9/15	7/15-- 9/30	8/05--10/20	8/20--11/05	X	X	
Wolf-tail *Lycurus phleoides*	7/01-- 8/30	8/01-- 9/20	9/01--10/20	9/15--11/05	X		
Bush muhly *Muhlenbergia porteri*	7/01-- 9/15	8/01--10/15	9/01--11/15	9/20--11/30	X		
Blue panic *Panicum antidotale*	7/01-- 9/15	8/01--10/15	9/01--11/15	9/15--11/30	X	X	
Vine mesquite *Panicum obtusum*	7/01-- 9/15	7/15-- 9/30	8/10--10/25	8/25--11/10	X		X
Plains bristlegrass *Setaria macrostachya*	7/01-- 9/15	7/15-- 9/30	8/10--10/25	8/25--11/10	X		
Squirreltail *Sitanion hystrix*	11/15	2/15-- 3/10	3/15-- 4/10	4/05-- 4/30	X		
Johnson grass *Sorghum halepense*	7/01-- 9/15	8/01--10/15	9/01--11/15	9/15--11/30	X	X	
Alkali sacaton *Sporobolis airoides*	7/01-- 9/15	8/01--10/15	9/01--11/15	9/15--11/30	X		
Sand dropseed *Sporobolis cryptandrus*	7/01-- 9/15	8/01--10/15	9/01--11/15	9/15--11/30	X		
Arizona cottontop *Trichachne californica*	7/01-- 9/15	8/01--10/15	9/01--11/15	9/15--11/30	X		
Slim tridens *Tridens mutica*	7/01-- 8/30	8/01-- 9/20	9/01--10/20	9/15--11/05	X		

TABLE 2-5
PHENOLOGY OF KEY SHRUB SPECIES OF UPPER GILA-SAN SIMON ES AREA

Shrub Species	Growth Initiation	Begin Flowering	Seed Ripe	Seed Dissemenation	Reproduction		
					Seeds	Rhizomes	Stolons
Herbaceous sage*	9/01	10/01	12/01	12/20			
Artemisia ludoviciana	1/15	2/15	4/01	4/20	X		
Four-wing saltbush							
Atriplex canescens	4/01-- 6/01	5/15-- 7/15	6/30-- 8/30	9/20--12/15	X		
False mesquite*	9/30	10/30	12/18	1/15			
Calliandra eriophylla	2/15	4/15	5/20	6/15	X		
Hairy mountain mahogany							
Cercocarpus breviflorus	4/15-- 6/15	5/15-- 7/15	7/15-- 9/15	10/15--12/15	X		
Buck brush*	11/20	12/15	1/30	3/15			
Ceanothus fendleri	2/20	3/15	4/30	6/15	X		
Desert ceanothus*	11/20	12/15	1/30	3/15			
Ceanothus greggii	2/20	3/15	4/30	6/15	X		
Feather dalea*	9/20	10/20	12/01	12/20			
Dalea formosa	1/15	2/15	4/01	4/20	X		
California buckwheat*	9/01	10/01	12/01	12/20			
Eriogonum fasciculatum	1/15	2/15	4/01	4/20	X		
Shrubby buckwheat*	9/01	10/01	12/01	12/20			
Eriogonum wrightii	1/15	2/15	4/01	4/20	X		
Winter fat*	9/01	10/15	12/01	12/20			
Eurotia lanata	4/01	6/01	7/15	8/15	X		
Range ratany							
Krameria parvifolia	2/15-- 4/15	4/01-- 6/01	5/15-- 7/15	7/15-- 9/15	X		
Jojoba*	10/15	11/15	12/30	2/15			
Simmondsia chinensis	1/15	2/15	5/15	7/15	X		

*Species undergoes two growth cycles a year when moisture is available. Dates represent average.

Cool-season grasses generally initiate growth in November and may remain green all winter. They produce little herbage, however, until temperatures begin to rise in February and March. Cool-season grasses usually produce seed in March or early April, depending on soil moisture and temperature.

Shrubs generally initiate growth early in the spring and flower by the end of April. Some species, such as hairy mountain mahogany, have been observed flowering in both the spring and fall. Again, available moisture appears to be the most critical factor in plant phenology.

Research conducted on the Santa Rita Experimental Range indicates that the critical growth period for warm-season grasses and shrubs is in the early spring when these plants initiate growth (Martin, 1973). The critical growth periods for cool-season grasses is in the fall or early spring when they initiate growth. The initiation of growth period is critical for plants because during this period plants use stored carbohydrate reserves. Harvesting of the new growth can deplete carbohydrate reserves and weaken plants, making them susceptible to frost or drought damage.

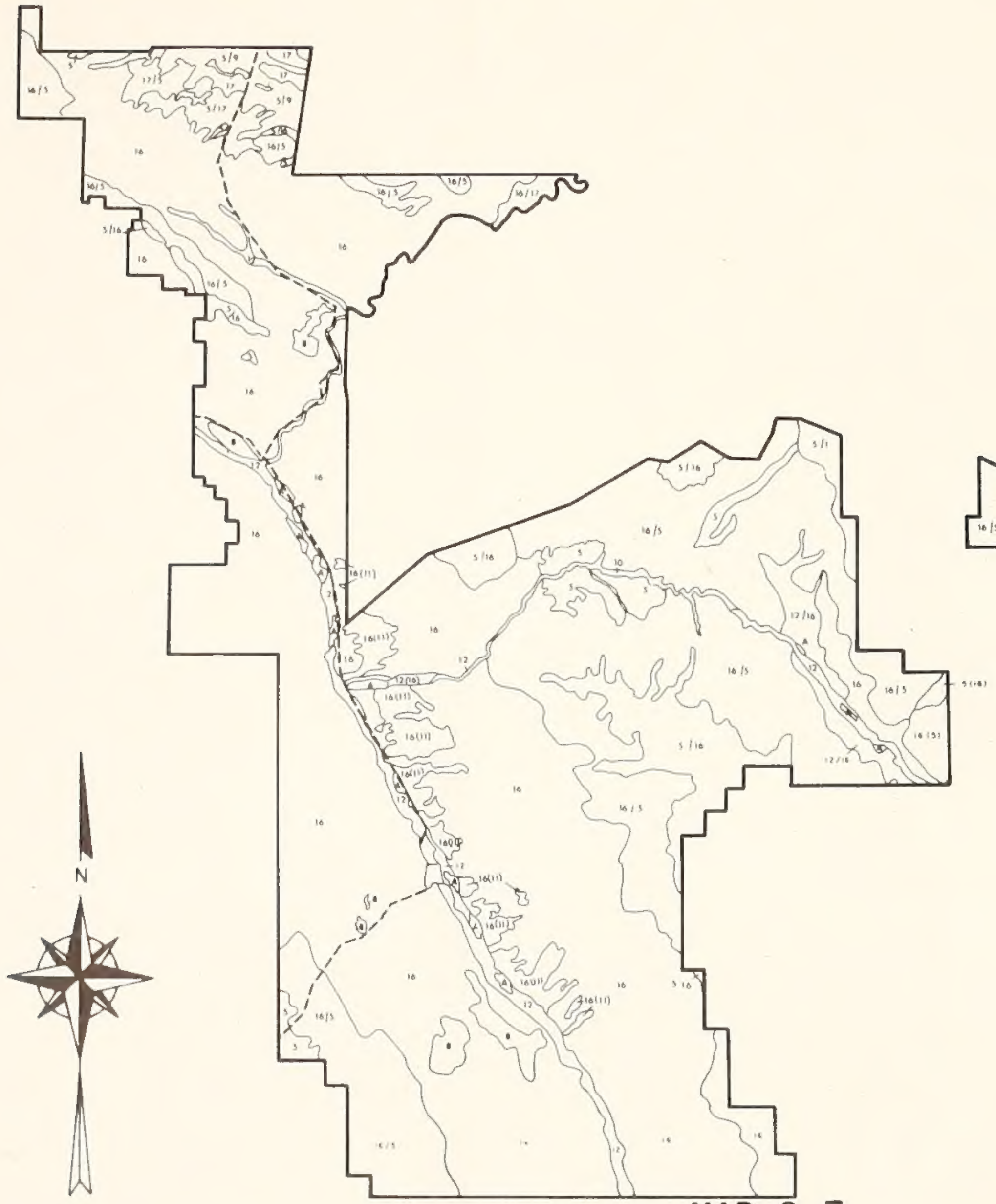
Vegetation Types

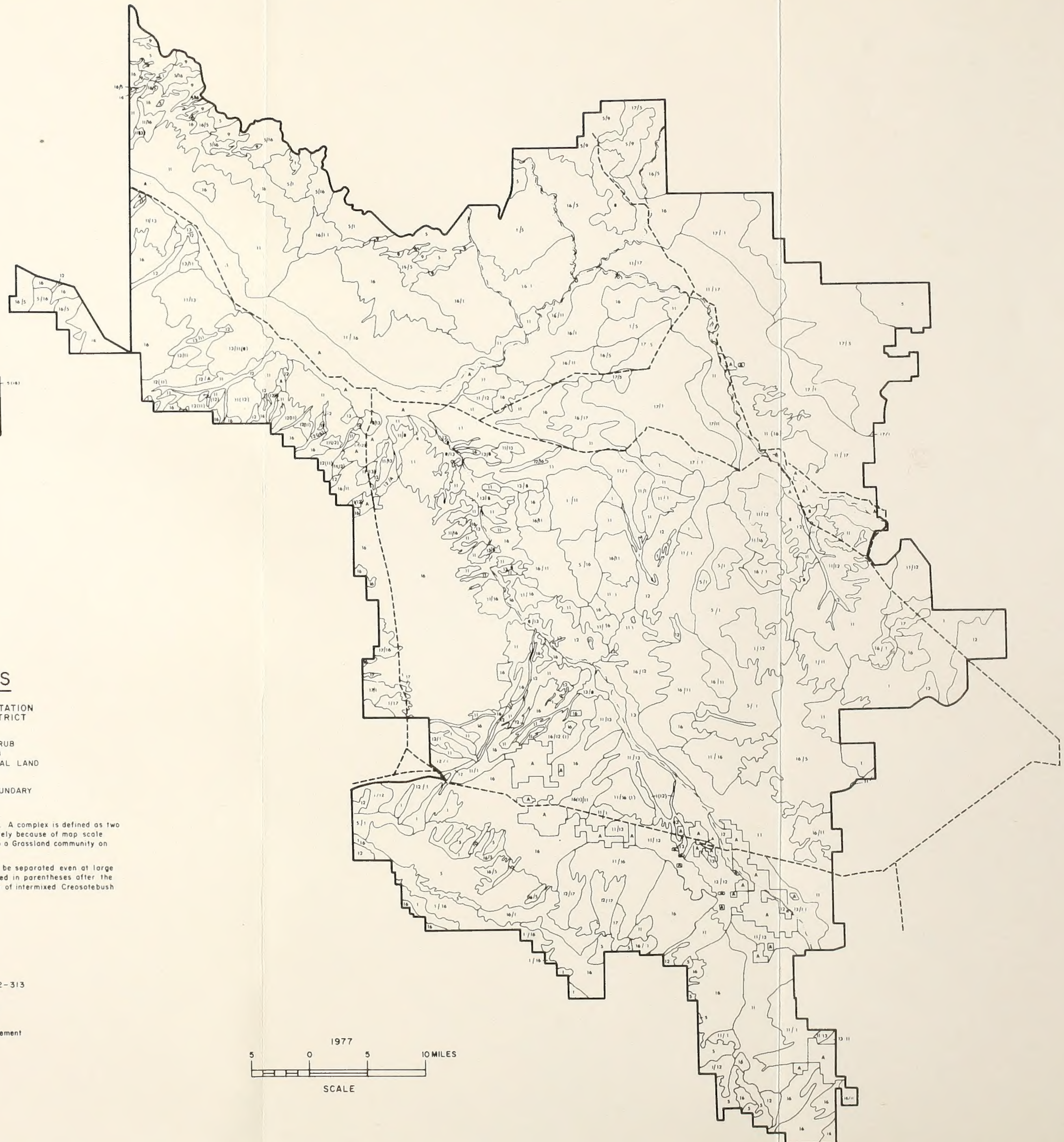
In 1976 the Office of Arid Land Studies, University of Arizona, Tucson, prepared a vegetation type map (scale 1:250,000) of the ES area, using high-altitude aircraft color infrared photography and Skylab color photography to aid in the mapping. Map 2-3 is a reduction of this vegetation type map.

Some of the vegetation types were mapped as complexes, which consist of mapping units containing two distinct vegetation types (a plant community with distinguishable characteristics) too small to be shown singly on the 1:250,000-scale map. Thus an area number coded as 1/17 consists of vegetation type 1 (grassland) as the dominant type and vegetation type 17 (half-shrub) as the secondary type. For tabulating acreage, a complex was listed as the dominant vegetation type, even though minor amounts of another vegetation type might have occurred within it.

The ES area contains 11 major vegetation types, which are shown in table 2-6 with the acreage of each type, each type's percentage of the total ES area, and the condition in acres of each type. A list of the major plant species of each type is on file in the Safford District office.

The vegetation of the ES area is complex. On the periphery of both the Chihuahuan and Sonoran Deserts, the ES area contains many species common to both. It also contains some species commonly found in the





MAP 2-3
VEGETATION TYPES

BLM NUMERICAL DESIGNATIONS OF VEGETATION TYPES OCCURRING IN THE SAFFORD DISTRICT

1. GRASSLAND	13. SALTBUSH
5. MOUNTAIN SHRUB	16. DESERT SCRUB
8. BARREN (no vegetation)	17. HALF-SHRUB
9. PINON-JUNIPER	A. AGRICULTURAL LAND
10. BROADLEAF RIPARIAN	R. RIPARIAN
11. CREOSOTEBUSH	-- HIGHWAYS
12. MESQUITE	▬ ES AREA BOUNDARY

COMPLEXES AND SUB-ASPECTS

Complexes of two vegetation types are represented by a slash, for example 5/1. A complex is defined as two distinct types occurring in a mosaic pattern which cannot be delineated separately because of map scale limitations. An example would be Mountain Shrub on mesic slopes adjacent to a Grassland community on the more xeric slopes in a rolling topography.

Sub-aspects are combinations of distinct BLM vegetation types which cannot be separated even at large scale. Sub-aspects are represented by the associated vegetative type enclosed in parentheses after the predominant type. Thus a Saltbush community with a considerable component of intermixed Creosotebush would be designated as 13(11).

This series of vegetation maps for the
Safford District of the U.S.D.I.
Bureau of Land Management
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With assistance from the
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TABLE 2-6
VEGETATION TYPES

Map Code	Vegetation Type	Acres	Percent of ES Area	Acres/Condition Excellent	Good	Fair	Poor
A	Irrigated cropland other land use areas	116,160	4.1	---	---	---	---
1	Grassland	170,560	6.1	10,400	27,200	78,880	54,080
5	Mountain shrub	224,160	8.0	24,840	105,280	52,520	41,520
8	Barren	33,440	1.2	0	0	0	33,440
9	Pinyon-juniper	11,360	0.4	7,040	2,320	1,100	900
10	Broadleaf riparian	3,360	0.1	0	0	2,400	960
11	Creosotebush	653,600	23.3	0	0	392,534	261,066
12	Mesquite	126,080	4.5	0	0	25,120	100,960
13	Saltbush	61,620	2.2	0	0	11,380	50,240
16	Desert shrub	1,219,412	43.5	19,360	74,960	652,987	472,105
17	Half-shrub	184,960	6.6	0	0	165,760	19,200
	Total	2,804,712	100.0	61,640	209,760	1,382,681	1,034,471

Great Basin Desert. Moreover, soil, precipitation, and elevation also contribute greatly to the diversity of the plant species found in the area.

Grassland Type. The grassland type (shown as 1 or 1/11 on map 2-7) comprises 170,560 acres or 6.1 percent of the total ES area. This type can be further subdivided into two distinct grassland types: (1) grasslands of the low alluvial fans and drainages (desert grasslands) and (2) grasslands of the mountains (mountain grasslands).

Desert grasslands generally occur between 3,000 and 4,500 feet above mean sea level, where precipitation ranges from 8 to 12 inches annually. Soils belong primarily to the Gila, Glendale, Grabe and Pima soil series. The grasslands at the lower elevations are generally found on sites that concentrate water from surrounding areas. Most of the lower elevation grasslands are in a swale or low alluvial fan.

The most abundant plant species found in this vegetation type are tobosa grass (*Hilaria mutica*), black grama (*Bouteloua eriopoda*), snakeweed (*Gutierrezia spp.*), burroweed (*Aplopappus tenuisectus*), mesquite (*Prosopis juliflora*), and creosotebush (*Larrea tridentada*).

Species important as food for livestock and wildlife are tobosa grass, alkali sacaton (*Sporobolus airoides*), black grama, and sideoats grama (*Bouteloua curtipendula*).

Johnson grass (*Sorghum halepense*) and giant blue panic (*Panicum antidotale*) are important food species in the Contest Well Seeding in grazing units 58 and 62.

The mountain or high-elevation grasslands occur from 4,500 to 5,500 feet in elevation, where annual precipitation ranges from 12 to 16 inches. Soils belong to the Atascosa, Graham, Whitehouse, Chiricahua, Cellar, Bonita, Rimrock, Faraway and Luzena soil series. This type occurs on high alluvial fans and mountains.

The mountain grassland plant community has no particular associated tree species indicative of the vegetation type. Tree species from the desert shrub type--mesquite, catclaw (*Acacia greggii*)--and the tree species from the mountain shrub type--juniper (*Juniperus spp.*), Emory oak (*Quercus emoryi*)--occur along washes and in wetter areas within the mountain grassland type.

The most abundant plant species associated with the mountain grasslands are sideoats grama (*Bouteloua curtipendula*), hairy grama (*Bouteloua hirsuta*), blue grama (*Bouteloua gracilis*), curly mesquite, Wright's buckwheat (*Eriogonum wrightii*), and burroweed.

Important plants for livestock and wildlife food are sideoats grama, hairy grama, blue grama, vine mesquite (Panicum obtusum), Wright's buckwheat, false mesquite (Calliandra eriophylla), winter fat (Eurotia lanata), and indigo bush (Dalea spp.). Palatable shrubby species are not abundant in this type, and livestock and deer complete for them.

The range condition of the grassland type is generally as follows: excellent--6 percent, good--16 percent, fair--46 percent, poor--32 percent. Because of historical overgrazing the vigor of the more desirable forage species is low.

Mountain Shrub Type. The mountain shrub vegetation type (shown as 5 or 5/1 on map 2-7) comprises 224,160 acres or 8.0 percent of the ES area. This type occurs at elevations between 5,000 and 8,300 feet, where annual precipitation ranges from 14 to 20 inches. This vegetation type generally occurs next to the mountain grassland plant community, which occurs on drier sites at lower elevations. The Mountain shrub type occurs on the Atascosa, Graham, Mabray, Chiricahua, Cellar, Rimrock, Faraway, and Luzena soil series. The topography is generally rough and mountainous. The most abundant plant species are blue grama, hairy grama, turpentine bush (Aplopappus laricifolius), snakeweed, juniper, Emory oak, and other oak species.

Plants important for livestock and wildlife food are sideoats grama, hairy grama, blue grama, slim tridens (Tridens muticus), Apache plume (Fallugia paradoxa), silk tassel (Garrya wrightii), desert ceanothus (Ceanothus greggii), hairy and birchleaf mountain mahogany (Cercocarpus breviflorus and Cerocarpus betuloides), and holly-leaf buckthorn (Rhamnus crocea). Livestock and wildlife compete for the shrub during the winter and early spring.

The range condition of the types is as follows: excellent--11 percent, good--47 percent, fair--23 percent, poor--19 percent.

Barren Type. The barren vegetation type (shown as 8 or 8/13 on map 2-3) comprises 33,440 acres or 1.2 percent of the ES area. This type occurs between 2,500 and 5,000 feet in elevation where precipitation averages from 8 to 12 inches annually. Soils belong to the Glendale, Gila, Latene, Grabe, Pima and Anthony soil series. This vegetation type occurs on broad flood plains along the San Simon River and along major washes that drain into the Gila River. Vegetation in this type is widely scattered. Some large areas are completely without perennial vegetation.

The barren type also includes mine waste dumps, slag piles, and mechanically disturbed landscapes around large mining operations, such as at Morenci. Almost no natural vegetation grows on these areas, although some of the mining companies are attempting revegetation with both native and introduced plant species. Major perennial plant species that may occur in the areas of the barren vegetation type are listed below.

Common Name	Scientific Name
creosotebush	*Larrea tridentata*
honey mesquite	*Prosopis juliflora* var. *velutina*
desert saltbush	*Atriplex polycarpa*
saltbush	*Atriplex obovata*
saltbush	*Atriplex acanthocarpa*
catclaw	*Acacia greggii*

These perennial plants, however, furnish little food for livestock or wildlife. All 100 percent of this type is in poor range condition.

Pinyon-Juniper Type. The pinyon-juniper vegetation type (shown as 9 on map 2-3) contains 11,360 acres or 0.4 percent of the ES area. This type lies between 5,500 and 7,000 feet in elevation, where precipitation ranges from 16 to 20 inches annually. Soils are of the Luzena and Faraway series. The topography is generally rough and mountainous. This type generally occurs on slightly wetter sites than the adjacent mountain shrub type.

The most common plant species are single-leaf pinyon (*Pinus monophylla*), Mexican pinyon (*Pinus cembroides*), juniper, blue grama, sideoats grama, mountain junegrass (*Koeleria cristata*), and spike pappusgrass (*Enneapogon desvauxii*).

Plants important as livestock and wildlife food are blue grama, sideoats grama, cliffrose, hairy and birchleaf mountain mahogany, and Mogollon and Fendler's ceanothus (*Ceanothus integerrimus* and *Ceanothus fendleri*).

The range condition of this type is as follows: excellent--62 percent, good--20 percent, fair--10 percent, poor--8 percent.

Broadleaf Riparian Type. The broadleaf riparian vegetation type (shown as 10 on map 2-3) contains 3,360 acres or 0.1 percent of the ES area. This type lies between 2,600 and 5,000 feet in elevation, where precipitation ranges from 11 to 16 inches annually. Soils are of recent alluvial material similar to the Arizo and Santo Tomas soil series. These soils are not delineated on the ES soils map because of the small area of the type and the small scale of the map.

This type occurs along perennial streams and wet areas. It was large enough to delineate (on a 1:250,000-scale map) only along Aravaipa Creek and in a few locations in the Dos Cabezas Mountains, but it occurs along Bonita, Eagle, and Apache Creek, along the San Francisco River, and in spots along the Gila River. Small areas near springs, seeps, or wetter places on desert washes also may contain some riparian species.

The most noticeable plant species are cottonwood (Populus fremontii), Arizona walnut (Juglans major), netleaf hackberry (Celtis reticulata), Arizona sycamore (Platanus wrightii), velvet ash (Fraxinus velutina), Apache plume, and batamote.

Plants important as food for livestock and wildlife are mountain mahogany, junegrass, bermuda grass, chuparosa (Anisacanthus thuberi), vine mesquite, Wright's buckwheat, Apache plume. In most areas the vegetation has poor vigor and is overgrazed by livestock and wildlife. Livestock and wildlife compete heavily for forage in this vegetation type since both naturally congregate in broadleaf riparian areas. Livestock have now been excluded from Aravaipa Canyon Primitive Area, and the vegetation is recovering.

The range condition of this type is as follows: fair--71 percent, poor--29 percent.

Creosotebush Type. The creosotebush type (shown as 11 or 11/16, etc. on map 2-3) contains 653,600 acres or 23.3 percent of the total ES area. This type lies between 1,800 and 4,000 feet in elevation, where annual precipitation averages from 8 to 10 inches. The creosotebush type occurs on the Nickel, Latene, Pinaleno or Cave soil series. It is found on nearly level to moderate sloping alluvial fans and valley plains.

The most abundant plants found in the creosotebush type are creosotebush, fluffgrass (Tridens pulchellus), bush muhly (Muhlenbergia porteri), and black grama.

Plants important as food for livestock and wildlife are tobosa grass, bush muhly, black grama, range ratany (Krameria parvifolia), Mexican crucillo (Condalia spathulata), tomatillo (Lycium exsertum), and squawberry (Lycium andersonii).

The range condition of the creosotebush type is as follows: fair--60 percent, poor--40 percent.

Mesquite Type. The mesquite vegetation type (shown as 12 or 12/1, etc. on map 2-3) consists of 126,080 acres or 4.5 percent of the ES area. Soils are of the Tubac, Sonoita, or Continental series. The mesquite type grows at elevations ranging from 1,900 to 4,000 feet, where precipitation averages from 8 to 12 inches.

The mesquite type occurs along perennial and ephemeral streams at lower elevations and on broad alluvial fans that have either been invaded by mesquite or have experienced mesquite increasing at the expense of other vegetation species. Along the banks of perennial streams mesquite may form a dense thicket or closed canopy and may reach tree sizes (20-35 feet). On broad alluvial fans the mesquite may be shrub sized and may occur on low sand dunes. Typically, the tree-sized mesquite is the honey mesquite, and the mesquite growing on sand dunes is the Torrey mesquite.

The mesquite vegetation type usually borders the desert shrub vegetation type and differs little from it. Generally, the desert shrub type has a greater variety of species than the mesquite type.

The major vegetation species found in the mesquite type along perennial streams have been listed with the broadleaf riparian vegetation. The major plants found in this type are mesquite, catclaw, Mexican tea (Ephedra trifurca), boundary ephedra (Ephedra fasciculata), soaptree yucca (Yucca elata), four-wing saltbush (Atriplex canescens), and burroweed.

Major food suppliers for livestock and wildlife are mesquite, catclaw, boundary ephedra, bush muhly, four-wing saltbush, tomatillo, and graythorn (Condalia lycioides).

The range condition of this type is as follows: fair--20 percent, poor--80 percent.

Saltbush Type. The saltbush vegetation type (shown as 13 or 13/8, etc. on map 2-3) comprises 61,620 acres or 2.2 percent of the ES area. This type occurs at elevations ranging from 2,900 to 3,700 feet, where precipitation averages 8 to 10 inches annually. Its plants grow on soils of the Gila, Glendale, Gothard, or Anthony series. The saltbush type occurs on flood plains of the San Simon River and on other major tributaries of the Gila River.

Major plants in the type are desert saltbush, four-winged saltbush, tobosa grass, alkali sacaton (Sporobolus airoides), honey mesquite, and catclaw.

Major food suppliers for livestock and wildlife are tobosa grass, alkali sacaton, four-wing saltbush, mesquite, catclaw, and desert saltbush.

The range condition of this type is fair--18 percent and poor--82 percent.

Desert Shrub Type. The desert shrub vegetation type (shown as 16 or 16/5, etc. on map 2-3) contains 1,219,412 acres or 43.5 percent of the total ES area and is the areas's largest vegetation type. It also has the greatest diversity of species of any of the area's types. On any given aspect, one or two plant species are usually dominant, but the same species are not dominant at all locations.

The desert shrub vegetation type occurs between 1,900 and 5,000 feet in elevation, where annual precipitation ranges from 8 to 14 inches. This type is found on alluvial fans, low hills, and on limestone soils at higher elevations in the Grabe, Pima, Tubac, Mabray, Graham, Caralampi, Whitehouse, Pinaleno, and Atascosa series.

Major plant species in the type as a whole are tobosa grass, black grama, false mesquite, jojoba (Simmondsia chinensis), indigo bush (Dalea spp.), whitethorn (Acacia constricta), mariola (Parthenium incanum), wolfberry (Lycium spp.), mescal (Agave palmeri), century plant (Agave parryi), cholla (Opuntia spp.), snakeweed, and prickly pear (Opuntia spp.).

Major plant species that furnish food for livestock and wildlife include sideoats grama, tobosa grass, black grama, Arizona cottontop (Trichachne californica), false mesquite, indigo bush, jojoba, prickly pear, and mesquite.

The range condition of this type is as follows: excellent--12 percent, good--6 percent, fair--53 percent, poor--39 percent.

Half-shrub Type. The half-shrub (a perennial plant with a woody base whose annually produced stems die each year) vegetation type (shown as 17 or 17/1, etc. on map 2-3) contains 184,960 acres or 6.6 percent of the ES area. This type occurs at elevations between 3,500 and 4,800 feet, where the average annual precipitation ranges from 10 to 12 inches. This type is generally found on moderately sloping alluvial fans and on low hills in the eastern portion of the ES area. It occurs on soils of the Bonita, Graham, Atascosa, and Rimrock series.

Major plant species include sideoats grama, hairy grama, black grama, curly mesquite, cane beardgrass, snakeweed, burroweed, turpentine bush, beargrass, and winterfat.

Plants important for livestock and wildlife food are sideoats grama, hairy grama, black grama, curly mesquite, Wright's buckwheat, winterfat, false mesquite, Baccharis brachyphylla, mesquite, and catclaw.

The range condition of this type is excellent--2 percent, good--6 percent, fair--53 percent, and poor--39 percent.

Irrigated Cropland and Other Land Use Areas. Irrigated cropland and other land use areas (shown as A on map 2-3) include 116,160 acres or 4.1 percent of the ES area. Most of this land, except for small isolated parcels, is privately owned and is best used for irrigated agriculture. The rest of this land is occupied by towns and other municipal uses. The range condition of this type has not been determined.

Annuals. An annual is a plant that completes its life cycle and dies in one year or less. Annual grass and forb production is a direct function of the timing and amounts of rainfall. Generally, moisture received at any time of the year will produce some annuals. The production of annual grasses and forbs in the ES area is sporadic and cannot be predicted for any forthcoming year. Annuals are dependent on the current year's precipitation, the timing and amount of which cannot be predicted.

The Santa Rita Experimental Range found that "on low elevation, low-rainfall ranges where annual grasses prevail, production of grass herbage can drop from 655 pounds per acre one year to 3 pounds the next, then shoot up to almost 900 pounds a year later" (Martin, 1975). Such experimentation documents the variability of production on ephemeral ranges, whose typical vegetation includes saltbush, creosotebush, mesquite, and desert shrub.

Annual plants occur in all of the ES area's vegetation types. Areas now managed as ephemeral range or proposed for ephemeral grazing management rely on annual forbs and grasses for the major portion of the forage available for livestock use.

Major soil series on these ephemeral ranges are Gila, Anthony, Glendale, Cave, Latene, Pinaleno, Nickel, and Sonoita. Range sites represented are Loam Bottom, Sand Bottom, Limy Upland, and Sandy Loam Upland.

Annual plants that furnish forage for livestock and wildlife include filaree (*Erodium circutarium*), purslane (*Portulaca oleracea*), red brome (*Bromus rubens*), six-weeks fescue (*Festuca octoflora*), six-weeks grama (*Bouteloua barbata*), pigweed (*Amorinthus spp.*), and annual muhly (*Muhlenbergia appressa*).

Poisonous Plants. Poisonous plants are not a significant problem in the ES area, since only on grazing units 63, 72, and 74 are livestock management considerations necessary to protect livestock from plant poisoning. The ES area contains many plants that are toxic to cattle, but most of these are not palatable to livestock. No estimate exists of annual livestock losses from poisonous plants. Losses from toxic plant-induced abortions are probably much higher than toxic plant-caused fatalities of mature stock. Livestock readily eat some plants, such as mountain mahogany or whitethorn, which may be poisonous only at certain times of the year (after frost). The following table lists the major poisonous plant species in the ES area.

POISONOUS PLANT SPECIES

Common Name	Scientific Name
Whitethorn	Acacia constricta
Catclaw	Acacia greggii
Careless Weed	Amaranthus palmeri
Horse-tail Milkweed	Asclepias subverticillata
Locoweed	Astragalus spp.
Mountain Mahogany	Cercocarpus spp.
Snakeweed	Gutierrezia spp.
Jimmyweed	Aplopappus heterophyllus
Burroweed	Aplopappus tenuisectus
Tumbleweed	Salsola kali
Cocklebur	Xanthium spp.
Thread-Leaf Groundsel	Senecio longilobus
Desert Marigold	Baileya multiradiata
Sacred Datura	Datura meteloides
Filaree	Erodium cicutarium
Spurge	Euphorbia spp.
Beargrass	Nolina microcarpa
White Horsenettle	Solanum elaeagnifolium
Goathead	Tribulus terrestris

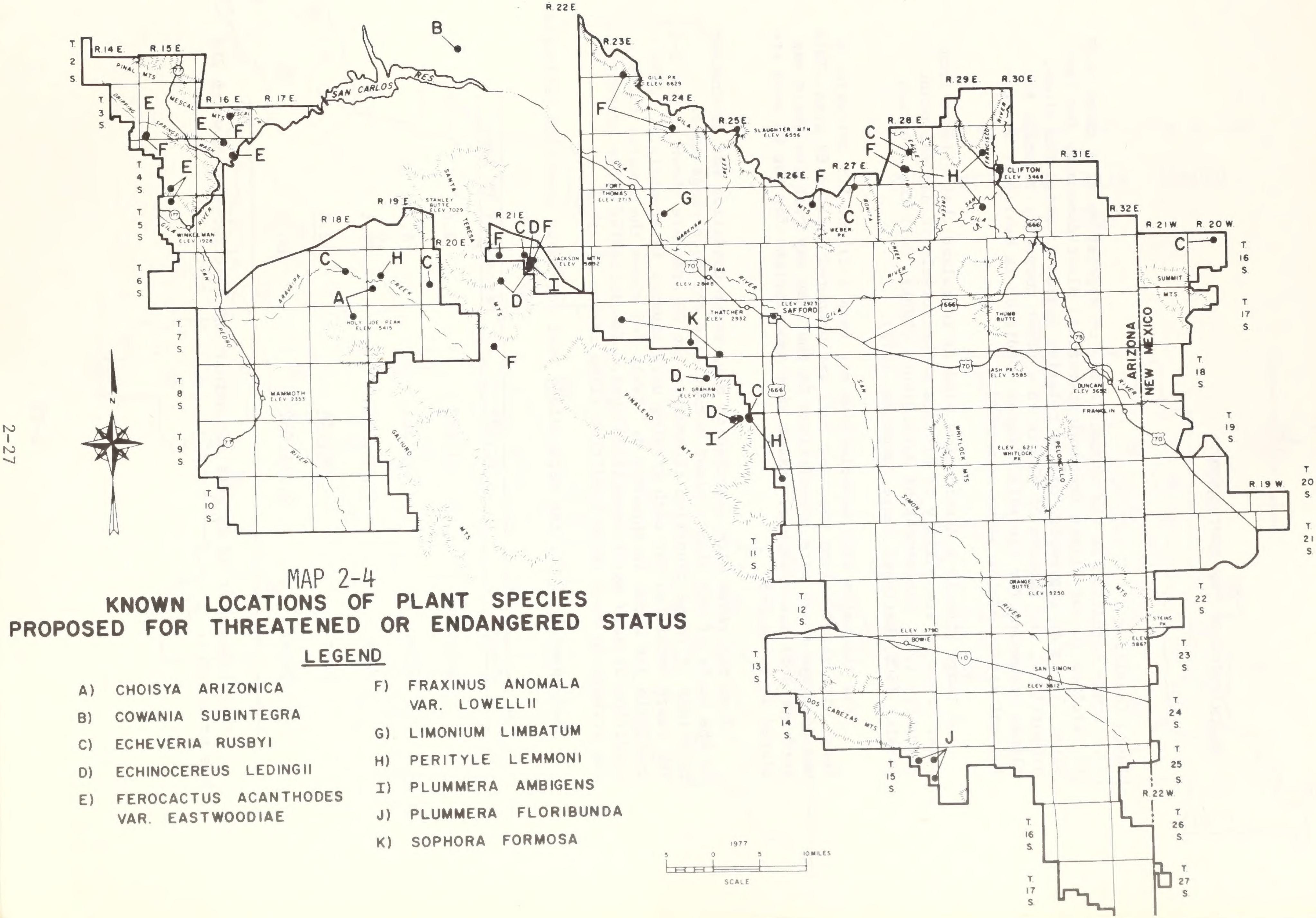
Threatened and Endangered Plant Species. The Federal Register, Volume 40, Number 127, July 1, 1975 listed possible candidates for the threatened or endangered plant species list. A survey to determine the status of candidate species listed 24 species whose range, habitat, and altitudinal distribution indicate their possible presence in the ES area. Table 2-7 depicts the present known status of these species. Of the species listed, 10 are confirmed to exist in the ES area, 4 probably exist, and 10 possibly exist. Known locations in the ES area of candidate threatened and endangered plant species are shown on map 2-4.

A copy of the botanist's report on the threatened and endangered plant species is available for inspection in the Safford District office.

TABLE 2-7
PROPOSED ENDANGERED AND THREATENED SPECIES
OCCURRING OR POSSIBLY OCCURRING IN THE ES AREA

Species	Status*	Occurrence in ES Area
Pectis rusbyi	E	Probable
Plummera ambigens	E	Confirmed
Echinocereus triglochidiatus var. arizonicus	E	Possible
Echeveria rusbyi	E	Confirmed
Sophora formosa	E	Confirmed
Cowania subintegra	E	Possible
Sphaeralcea fendleri var. albescens	E	Possible
Eriogonum capillare	E	Probable
Erigeron lobatus	T	Probable
Erigeron pringlei	T	Possible
Gutierrezia linoides	T	Possible
Perityle lemmoni	T	Confirmed
Plummera floribunda	T	Confirmed
Echinocereus ledingii	T	Confirmed
Ferocactus acanthodes var. eastwoodiae	T	Confirmed
Mammillaria orestera	T	Possible
Neolloydia erectrocentra var. erectrocentra	T	Possible
Fraxinus anomala var. lowellii	T	Confirmed
Limonium limbatum	T	Confirmed
Puccinellia parishii	T	Probable
Eriogonum apachense	T	Possible
Cheilanthes pringlei	T	Possible
Choisya arizonica	T	Confirmed
Atriplex griffithsii	T	Possible

*E - Endangered, T - Threatened



MAP 2-4

KNOWN LOCATIONS OF PLANT SPECIES PROPOSED FOR THREATENED OR ENDANGERED STATUS

LEGEND

A) CHOISYA ARIZONICA
B) COWANIA SUBINTEGRA
C) ECHEVERIA RUSBYI
D) ECHINOCEREUS LEDINGII
E) FEROCACTUS ACANTHODES VAR. EASTWOODIAE
F) FRAXINUS ANOMALA VAR. LOWELLII
G) LIMONIUM LIMBATUM
H) PERITYLE LEMMONI
I) PLUMMERA AMBIGENS
J) PLUMMERA FLORIBUNDA
K) SOPHORA FORMOSA

Range Condition

Range condition is the present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble the climax community for the site. Range condition is basically an ecological rating of the plant community.

A range site is a distinctive kind of rangeland that differs from other kinds in its ability to produce a characteristic natural plant community (U.S. Department of Agriculture (USDA), Soil Conservation Service (SCS) National Range Handbook, 1976).

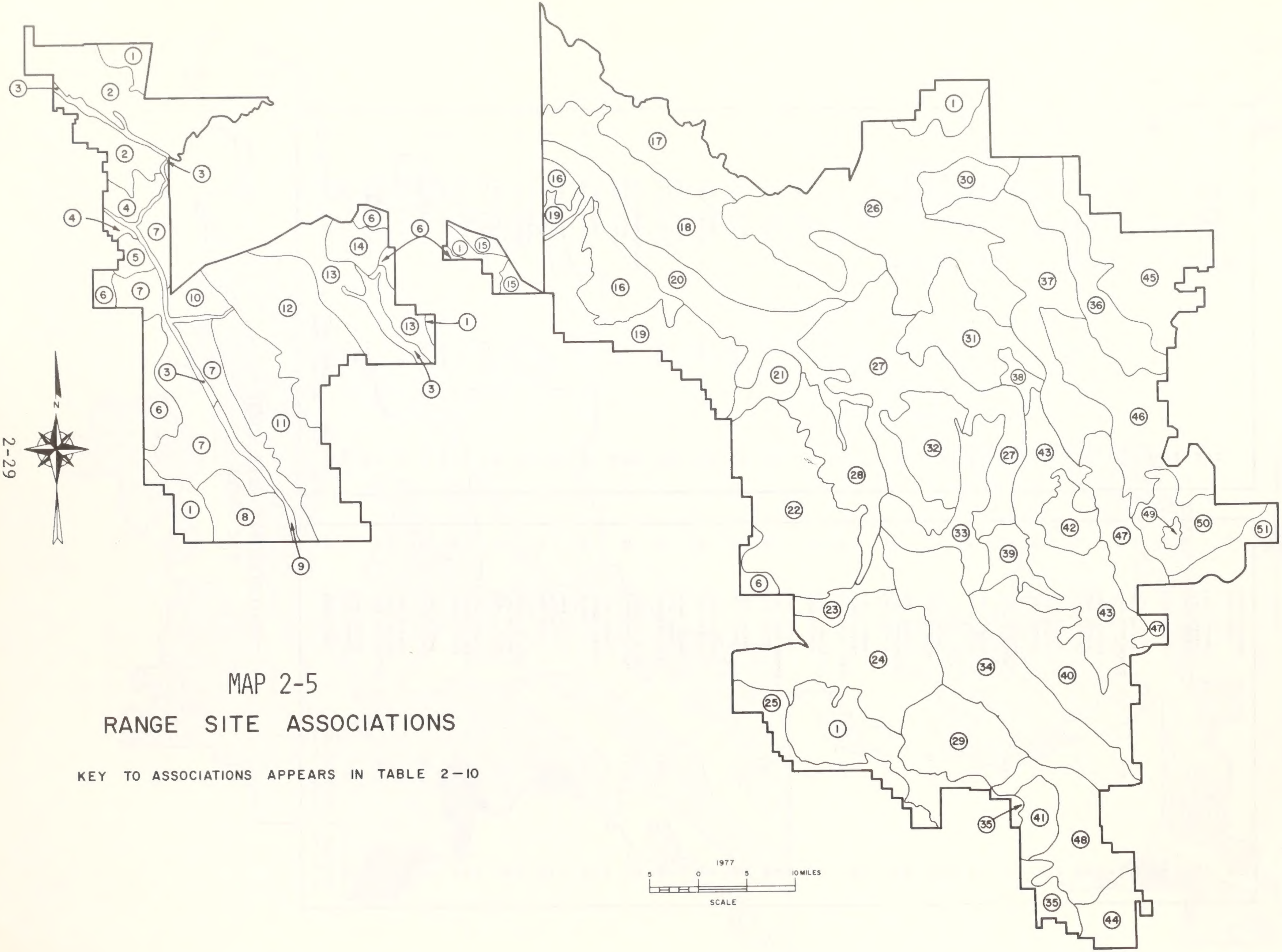
From the major soil associations map (map 2-2) and SCS criteria, a range site associations map (map 2-5) was prepared for the ES area. This map portrays range site associations in the same way that the soils map portrays soil associations. Range site associations for the ES area are listed in table 2-8.

From the range site association map, range condition was determined on the basis of SCS climax plant communities for each range site. Locations of range condition classes in the ES area are shown on map 2-6. The range condition for each grazing unit appears in appendix C. AUMs available are shown in appendix B. Table 2-6 shows the general range condition of each major vegetation type. The following table presents the acreage in each range condition class in the ES area.

See appendix A for the methodology used for range condition estimates.

Class	Acres*	Percent of ES Area
Excellent	61,640	2.6
Good	145,564	6.2
Fair	1,230,334	52.4
Poor	908,524	38.8
Total	2,346,062	100.0

* Excludes part of ES area not within BLM allotments over which BLM has no control.



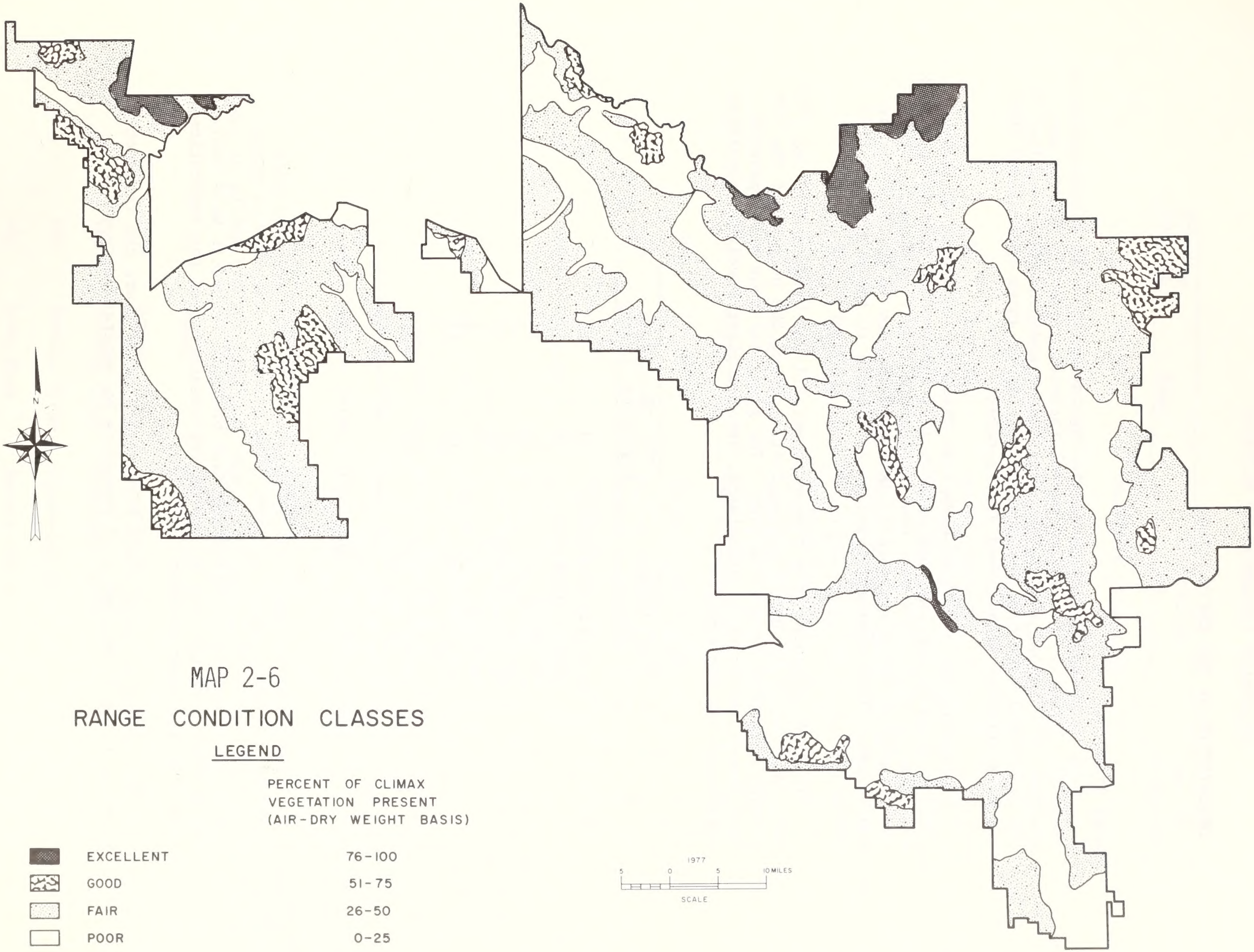
MAP 2-5

RANGE SITE ASSOCIATIONS

KEY TO ASSOCIATIONS APPEARS IN TABLE 2—10

TABLE 2-8
RANGE SITE ASSOCIATIONS

No.	Range Sites	Annual Inches of Precipitation	Percent of Association
1	Granitic Hills	16-20	100
2	Limestone Hills Granitic Hills	12-16	80 20
3	Sand Bottom	12-16	100
4	Limy Upland	12-16	100
5	Loamy Upland	12-16	100
6	Granitic Hills	12-16	100
7	Sandy Loam Upland Limy Upland	12-16	80 20
8	Loamy Upland Limy Upland	12-16	70 30
9	Loam Bottom Sand Bottom	7-12	70 30
10	Loamy Upland Limy Upland	12-16	60 40
11	Loamy Upland Limy Upland Sandy Loam Upland	12-16	60 20 20
12	Volcanic Hills Granitic Hills Loamy Upland	16-20	40 40 20
13	Loamy Upland Limy Slopes	12-16	60 40
14	Loamy Upland Limy Slopes	12-16	80 20
15	Loamy Upland Limy Upland	7-12	80 20
16	Limy Upland Loam Bottom	7-12	50 50
17	Volcanic Hills Basalt Hills	12-16	80 20
18	Limy Upland Loamy Upland	7-12	65 35
19	Loamy Upland Limy Upland Loam Bottom	7-12	50 30 20
20	Loam Bottom Sand Bottom	7-12	80 20
21	Limy Upland Loam Bottom	7-12	70 30
22	Sandy Loam Upland Loamy Upland	7-12	60 40
23	Limy Upland Loamy Upland	7-12	60 40
24	Sandy Loam Upland Loamy Upland Clay Bottom	7-12	60 30 10
25	Granitic Hills Limestone Hills Loamy Upland	12-16	70 15 15
26	Basalt Hills Volcanic Hills Limy Upland	12-16	50 30 20
27	Clay Loam Upland Limy Upland Loamy Upland	7-12	50 35 15
28	Limy Upland Loam Bottom	7-12	50 50
29	Clay Loam Upland Loamy Upland Loam Bottom	7-12	50 25 25
30	Loamy Upland Limy Upland	12-16	50 50
31	Basalt Hills Volcanic Hills Limy Upland	12-16	40 30 30
32	Basalt Hills Clay Upland Volcanic Hills	7-12	70 20 10
33	Deep Sand Saline Loam Bottom	7-12	60 25 15
34	Saline Saline Bottom Limy Upland	7-12	60 20 20
35	Limestone Hills Granitic Hills	12-16	70 30
36	Granitic Hills Clay Upland Loamy Upland	12-16	60 35 15
37	Limy Upland Loamy Upland	7-12	80 20
38	Limy Upland Clay Upland	7-12	60 40
39	Clay Upland Clay Loam Upland Limy Upland	7-12	50 30 20
40	Limy Upland Clay Loam Upland	7-12	75 25
41	Clay Loam Upland Loamy Upland Limy Upland	7-12	70 20 10
42	Clay Upland Clay Loam Upland Limy Upland	10-16	40 30 30
43	Basalt Hills Clay Upland Volcanic Hills	10-16	60 20 20
44	Loamy Upland Sand Bottom	12-16	90 10
45	Volcanic Hills Loamy Upland	16-20	75 25
46	Limy Upland Loam Bottom Clay Bottom	7-12	75 15 10
47	Clay Upland Limy Upland Loamy Upland	7-12	60 20 20
48	Clay Loam Upland Limy Upland Clay Bottom	7-12	40 30 30
49	Basalt Hills	7-12	100
50	Loamy Upland Clay Upland Limy Upland	7-12	40 20 40
51	Deep Sand Loamy Upland	7-12	80 20



MAP 2-6

RANGE CONDITION CLASSES

Range Trend

Range trend refers to change in vegetation and soil characteristics resulting directly from environmental factors, primarily climate and grazing, (BLM Manual 4412-22C). The range trend procedures outlined in the BLM manual have been followed on allotments under implemented AMPs but have not been established districtwide.

Range studies and trend have been evaluated regularly on those grazing units having implemented AMPs (for implemented AMPs see appendix B). Most of these AMPs have been implemented for 7 to 9 years. The trend index on these implemented AMPs is down from 10 to 20 points in most cases. This downward trend is attributed to the overstocking of livestock.

In 1976 permanent line transects established between 1953 and 1955 were reinventoried. The following listing shows the percent of the 109 transects in each vegetation type. The grassland type was separated into desert and mountain grasslands, because plant species composition differs in the two types.

Vegetation Type	No. of Transects	% of Total
Mountain Grassland	31	28
Desert Grassland	16	15
Mesquite	16	15
Desert Shrub	16	15
Mountain Shrub	12	11
Saltbush	2	2
Creosotebush	16	15
Total	109	101*

*Total does not equal 100 because of rounding.

Figures 2-2 through 2-8 were drafted from line transect data gathered for each vegetation type. The average percentage of grass cover and canopy cover (shrubs, trees, and half-shrubs) making up vegetation cover has been charted for each year the transects were read. Annual precipitation from locations representative of the vegetation type have also been plotted.

The following table lists the grazing units where the transects were located and the number of transects by vegetation type.

LOCATION OF PERMANENT TRANSECTS

Grazing Unit No.	Name	Vegetation Type	No. of Transects
7	Gila	Mountain Grassland	2
9	Airport	Mountain Grassland	3
12	Hoverrocker	Mountain Grassland	5
		Creosotebush	1
26	Tollgate	Desert Shrub	4
		Creosotebush	2
		Mountain Shrub	2
27	Guthrie Peak	Mountain Grassland	9
36	Carlisle	Mountain Shrub	4
		Creosotebush	2
37	Woods Canyon	Mountain Grassland	6
43	Lazy B	Desert Grassland	8
46	Creosote	Creosotebush	1
48	Hackberry	Desert Shrub	2
		Desert Grassland	3
		Mesquite	2
49	Chimney	Mountain Grassland	6
		Desert Grassland	2
		Creosotebush	1
50	Ash Peak	Desert Grassland	5
52	Stockton Pass	Desert Shrub	2
54	Van Gausig	Desert Shrub	2
58	Fan	Saltbush	2
62	Murchison	Creosotebush	3
		Mesquite	14
75	Silverstrike	Mountain Shrub	2
79	Vanar	Desert Shrub	2
158	Bryce	Creosotebush	2
165	Johnny Creek	Mountain Shrub	2
166	Bonita Creek	Creosotebush	4
163	Lone Star	Desert Shrub	2
182	Holdup Canyon	Mountain Shrub	2

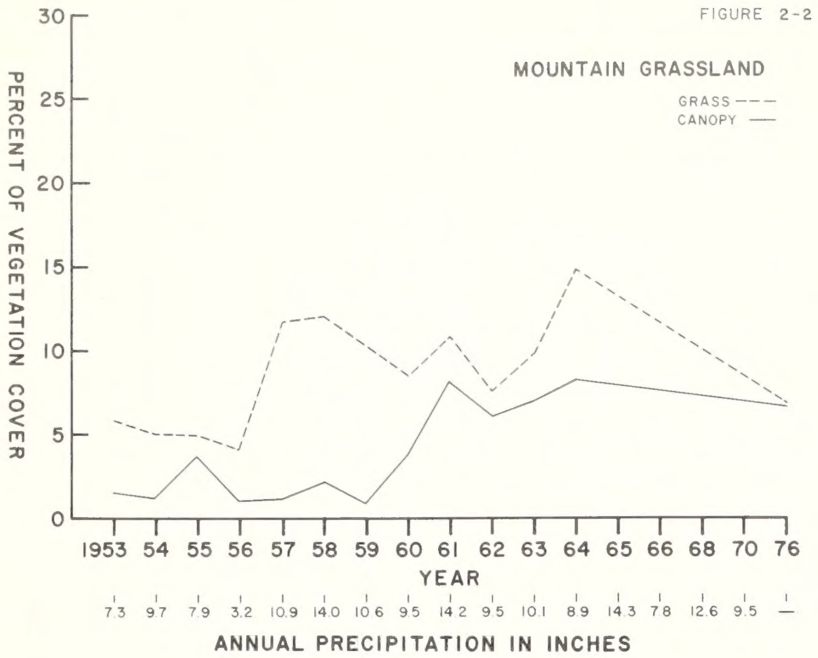


FIGURE 2-2

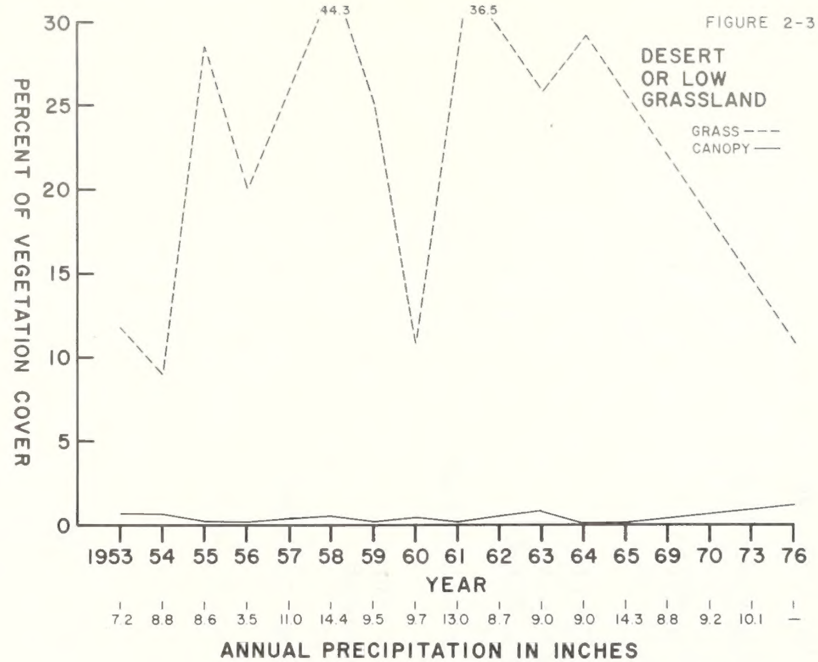


FIGURE 2-3

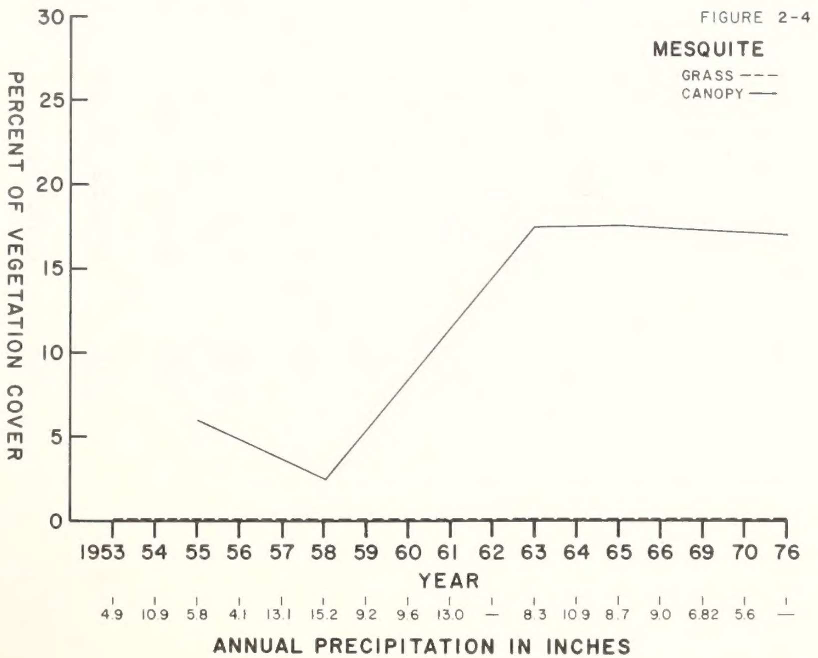


FIGURE 2-4

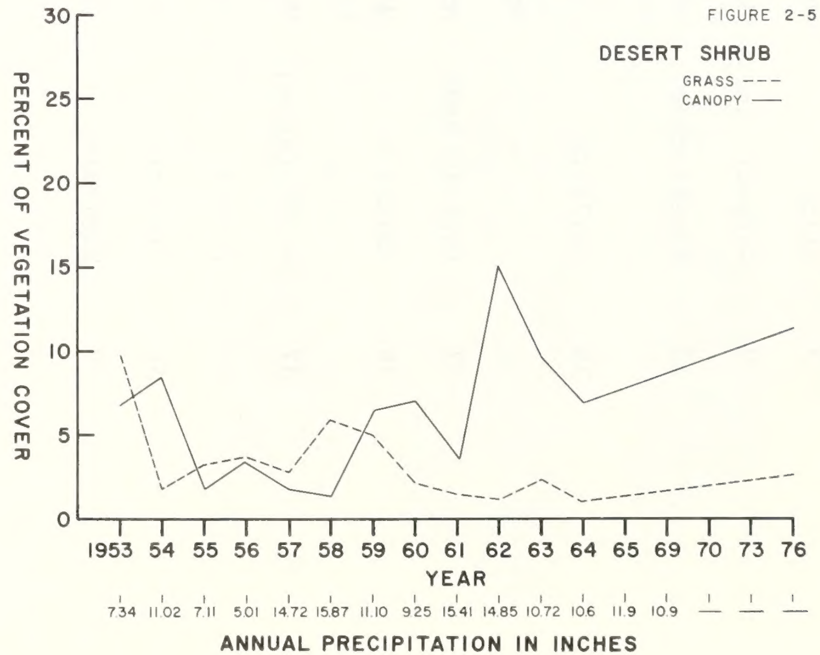


FIGURE 2-5

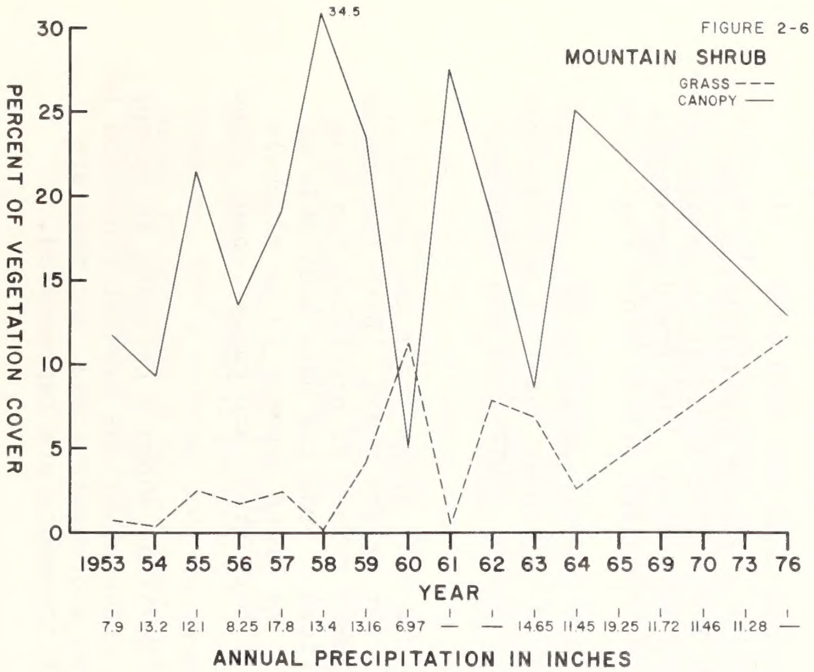


FIGURE 2-6
MOUNTAIN SHRUB
GRASS
CANOPY
34.5
PERCENT OF VEGETATION COVER
0 5 10 15 20 25 30
1953 54 55 56 57 58 59 60 61 62 63 64 65 69 70 73 76
YEAR
7.9 13.2 12.1 8.25 17.8 13.4 13.16 6.97 — — 14.65 11.45 19.25 11.72 11.46 11.28 —
ANNUAL PRECIPITATION IN INCHES

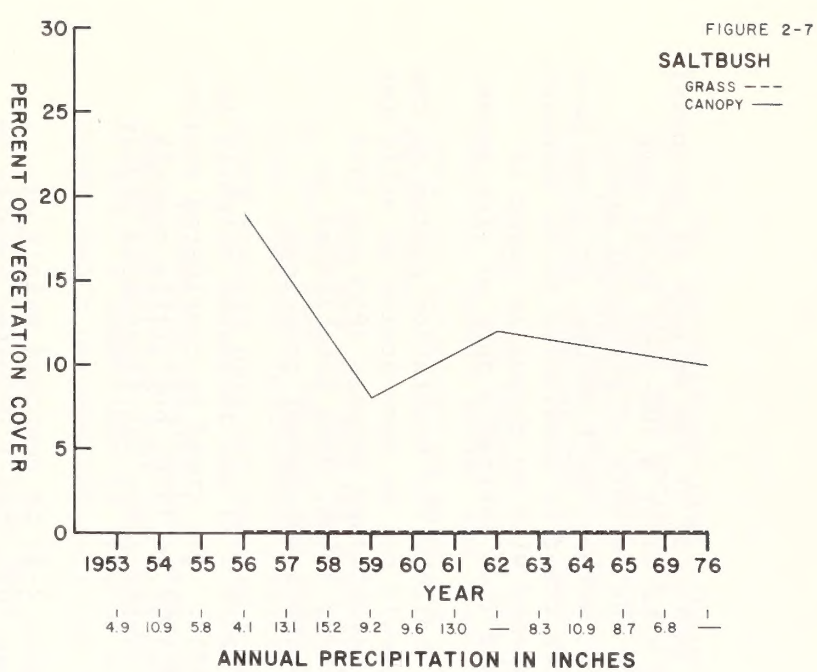


FIGURE 2-7
SALTBUSH
GRASS
CANOPY
PERCENT OF VEGETATION COVER
0 5 10 15 20 25 30
1953 54 55 56 57 58 59 60 61 62 63 64 65 69 76
YEAR
4.9 10.9 5.8 4.1 13.1 15.2 9.2 9.6 13.0 — 8.3 10.9 8.7 6.8 —
ANNUAL PRECIPITATION IN INCHES

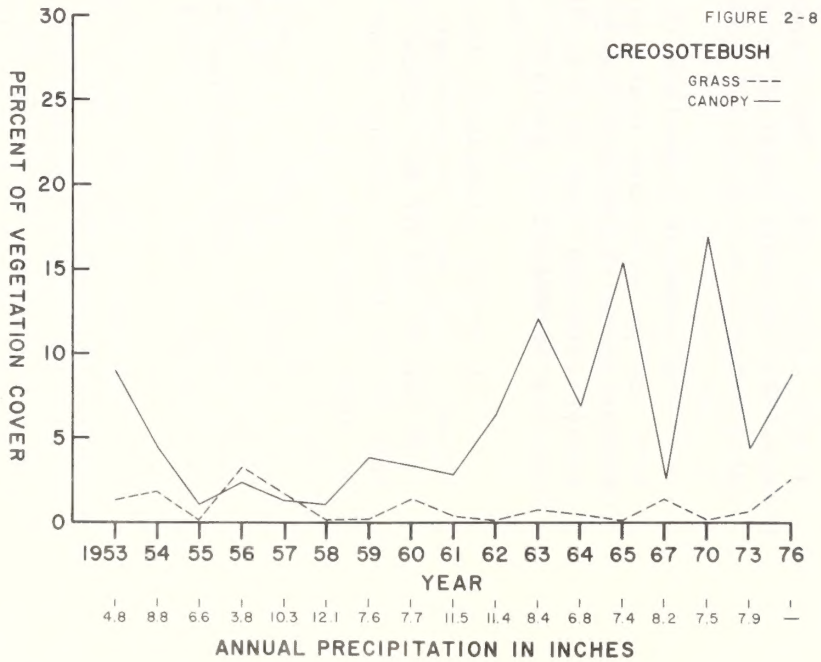


FIGURE 2-8
CREOSOTEBUSH
GRASS
CANOPY
PERCENT OF VEGETATION COVER
0 5 10 15 20 25 30
1953 54 55 56 57 58 59 60 61 62 63 64 65 67 70 73 76
YEAR
4.8 8.8 6.6 3.8 10.3 12.1 7.6 7.7 11.5 11.4 8.4 6.8 7.4 8.2 7.5 7.9 —
ANNUAL PRECIPITATION IN INCHES

The trend is considered to be improving if the amounts of perennial grass species (as measured by basal area along a 100-foot line) have increased over time, and downward if the amounts of perennial grass species have decreased over time. If shrubs, half-shrubs, or trees have increased with a loss of grasses, the trend is considered to be downward. The trend may also be upward or downward with no change in cover if desirable plant species have replaced less desirable ones or vice versa.

The line transects accurately indicate the vegetation status at the transect location, but these data should not be interpreted as valid for a much larger area. The transects established between 1953 and 1955 were not randomly located, and, in many cases, were established on allotments with relatively good livestock management practices.

The mountain grassland type (figure 2-2) has increased slightly in both canopy and grass cover since 1953. The trend is considered static. Canopy cover fluctuated widely from 1962 to 1976, but little overall change occurred from 1953 to 1976. Grass cover has fluctuated widely and has increased slightly.

The desert grassland type (figure 2-3) is composed mainly of tobosa grass and creosotebush. Grass cover has fluctuated greatly in response to wet or dry years, but total grass cover remains much the same as in 1953. Canopy cover has remained static. The trend is static on these transects.

Little influenced by fluctuations in yearly precipitation, the mesquite type (figure 2-4) has shown a dramatic increase in canopy cover since 1955. Grass cover has remained near zero. The trend apparently was downward from 1958 to 1963 and has remained static since that time.

The desert shrub type (figure 2-5) has increased canopy cover and decreased grass cover. The fluctuation in canopy cover is attributable to changes in the populations of half-shrubs (burroweed and snakeweed primarily). The trend is downward.

In the mountain shrub type (figure 2-6) grass cover and canopy cover have fluctuated greatly due to wet or dry years. Both the amount and timing (cool season rains vs. summer rains) of precipitation have had a great impact on these fluctuations. From the data available no estimates of the trend can be made. The trend appears to be slightly upward, but past high fluctuations of both grass and canopy cover allow no definite judgement.

The saltbush type (figure 2-7) has shown a decrease in canopy cover during the past 10 years. No grass cover was present from 1956 to the present. The data appear to show a downward trend, but they are inconclusive since only two 100-foot transects are represented.

The creosotebush type (figure 2-8) has remained relatively static in canopy cover and increased slightly in grass cover. The trend is considered static. Canopy cover fluctuated widely from 1962 to 1976, but little overall change occurred from 1953 to 1976. Grass cover fluctuated some but not as much as canopy cover.

Since 1953 canopy cover has increased on the mountain grassland, mesquite, desert shrub, and mountain shrub vegetation types. Grass cover has increased on mountain grassland, creosotebush, and mountain shrub types.

Data are not available to show the range trend on each grazing unit in the ES area, but one can infer in general that since 1953 (1) woody plant species (half-shrubs, shrubs, and trees) have increased and (2) grass species have not changed greatly on most of the vegetation types.

Livestock grazing has been responsible for some of the vegetation changes occurring over the past 20 years, but climate has had a large effect. A comparison of figures 2-2 through 2-8 shows immediately the relationship between rainfall and vegetation cover.

Deficiencies in Vegetation Data

The following deficiencies in vegetation data exist for the ES area.

1. Data have not been gathered to determine the current or potential production by soil type, grazing unit, or vegetation type. Range production in acres/AUM have been estimated for 72 percent of the area without an inventory of species composition and density by vegetation type. See appendix A for the methodology applied.

2. The current soil survey available for the ES area is not of sufficient detail to make an estimate of current or potential vegetation production by soil type. The ocular reconnaissance range survey method (appendix A) is not based on soil types but rather on vegetation types. To accurately estimate vegetation production by soil types requires a soil survey of at least the third order of intensity combined with vegetation clipping studies. The ES area is currently about 40 percent mapped by a third order soil survey, and two soil surveys are currently in progress to cover the rest of the area.

3. The range condition data presented in this ES are adequate for providing a general picture of the range condition. They are inadequate, however, for a grazing unit-by-grazing unit analysis of range condition. Refer to appendix A for an explanation of the methodology used in estimating range condition.

4. Range trend data in this chapter provide an overall view of the range trend in the ES area but do not provide a grazing unit-by-grazing unit analysis of range trend. Trend analyses are not available for all grazing units proposed for intensive management. The permanent transects that were reinventoried are not reliable indicators of range trend for the ES area as a whole because they were not randomly located. For each proposed AMP, range studies have been initiated, but data are not yet available for analysis.

Animals

Terrestrial Habitat

The ES area's great complexity of physical features and vegetation provide habitat for a wide variety of wildlife species. Although approximately 80 percent of the ES area constitutes desert scrub vegetation types, several smaller but highly desirable mountainous and riparian areas contribute to the overall numbers and wildlife species diversity far out of proportion to their size. Uniquely situated close to the Mexican border, the area provides habitat for a number of species more common to Latin America. Relatively mild temperatures allow certain birds to remain over winter. The overall species diversity of the resident wildlife is great, and the avifauna is especially complex. Along with resident bird species are a constant ebb and flow of summer, winter, and transient birds.

A list of all wildlife species known or expected to occur in the ES area or that have occurred there some time in the past is on file in the Safford District office. This list includes 23 species of fish, 13 amphibians, 65 reptiles, 275 birds, and 84 mammals.

In 1976 BLM contracted with the Arizona Game and Fish Department (AG&FD) to develop wildlife population estimates. AG&FD based their estimates on the five-digit level of Brown and Lowe's (1974a) vegetation communities. At that time the BLM vegetation type classification detailed in chapter 2 was not available. The BLM classification equivalents to the Brown and Lowe classification are as follows:

BROWN AND LOWE	BLM
Encinal and Mexican Pine-Oak Woodland Interior Chaparral	Mountain Shrub
Juniper-Pinyon Woodland	Pinyon-Juniper
Desert Grassland	Desert Grassland
Sonoran Desertscrub Chihuahuan Desertscrub	Creosotebush Mesquite Saltbush Desert Shrub Half-Shrub
Riparian Deciduous Forest	Broadleaf Riparian

The ES area involves two AG&FD regions and includes all or portions of wildlife management units 24A, 27, 28, 29, 30A, 31, 32, and 33 (map 2-7). Unit 28 contains the most and best blocked public lands administered by BLM. The remaining units contain scattered and relatively small public land parcels, although some important blocks occur in units 24A and 30A. Included also in the ES area are scattered public lands in the New Mexico Game and Fish Department wildlife management unit 54 and several hundred acres in unit 57, next to the Arizona State line.

Relatively little scientific wildlife research has been conducted in the area, requiring many inferences to be drawn about the ES area from studies conducted elsewhere.

Mule Deer. Mule deer are the most numerous and harvested big-game species in the ES area, lending economic importance to their numbers. Big-game population estimates (table 2-9) were derived from AG&FD information. Appendix E contains estimates of present and potential densities for big-game species occurring in the ES area. Mule deer habitat is shown on map 2-8.

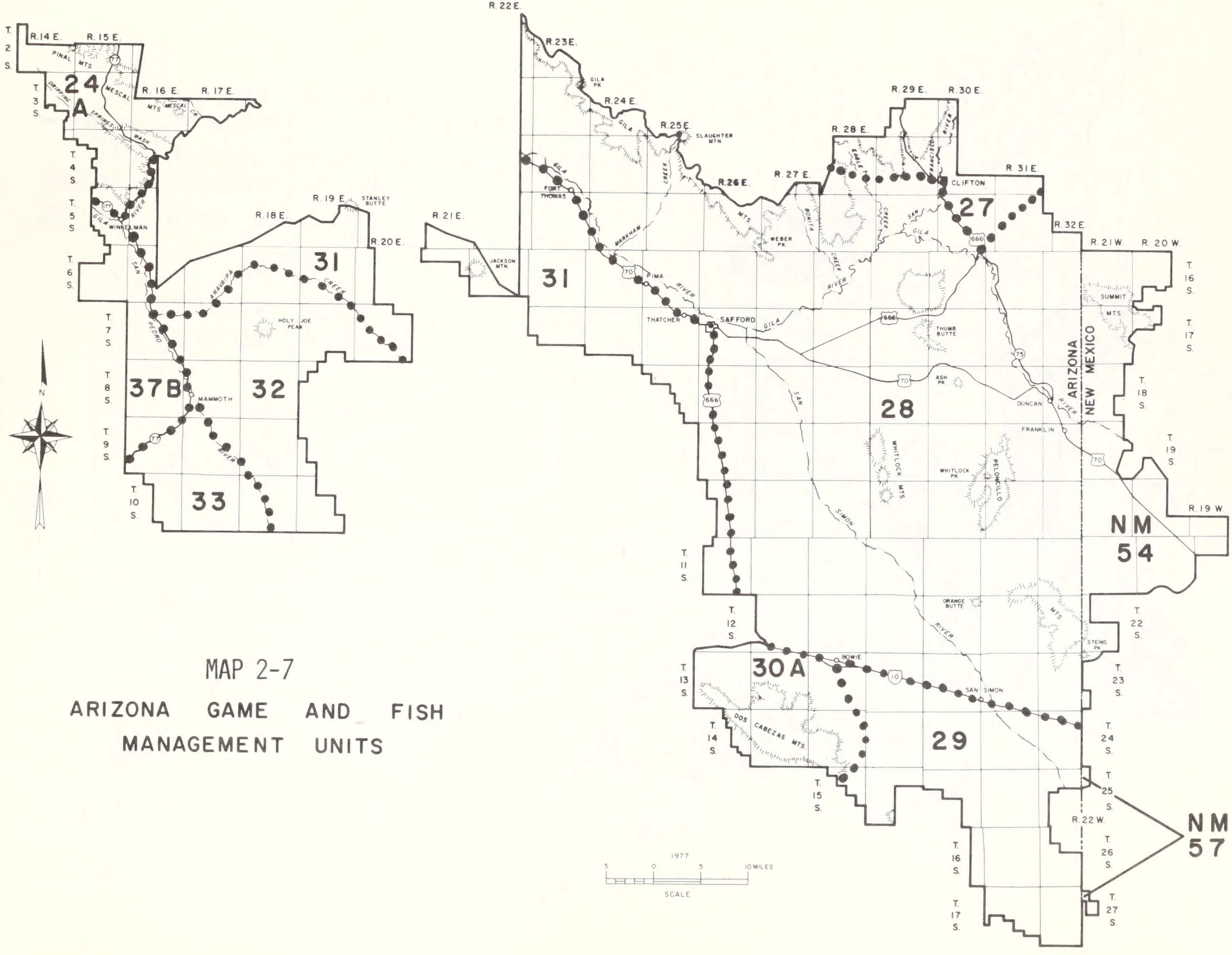
TABLE 2-9
PRESENT BIG-GAME POPULATION ESTIMATES*

ANIMAL	POPULATION	(YEAR)
Mule deer	4,200	(1976)
White-tailed deer	550	(1976)
Javelina	4,135	(1976)
Elk (periodic use)	35-40	(1972)
Bighorn sheep	30-35	(1976)
Antelope	20	(1976)
Lion	8-12	(1976, BLM estimate)
Bear	6-10	(1976, BLM estimate)

*For the entire ES area, regardless of ownership.

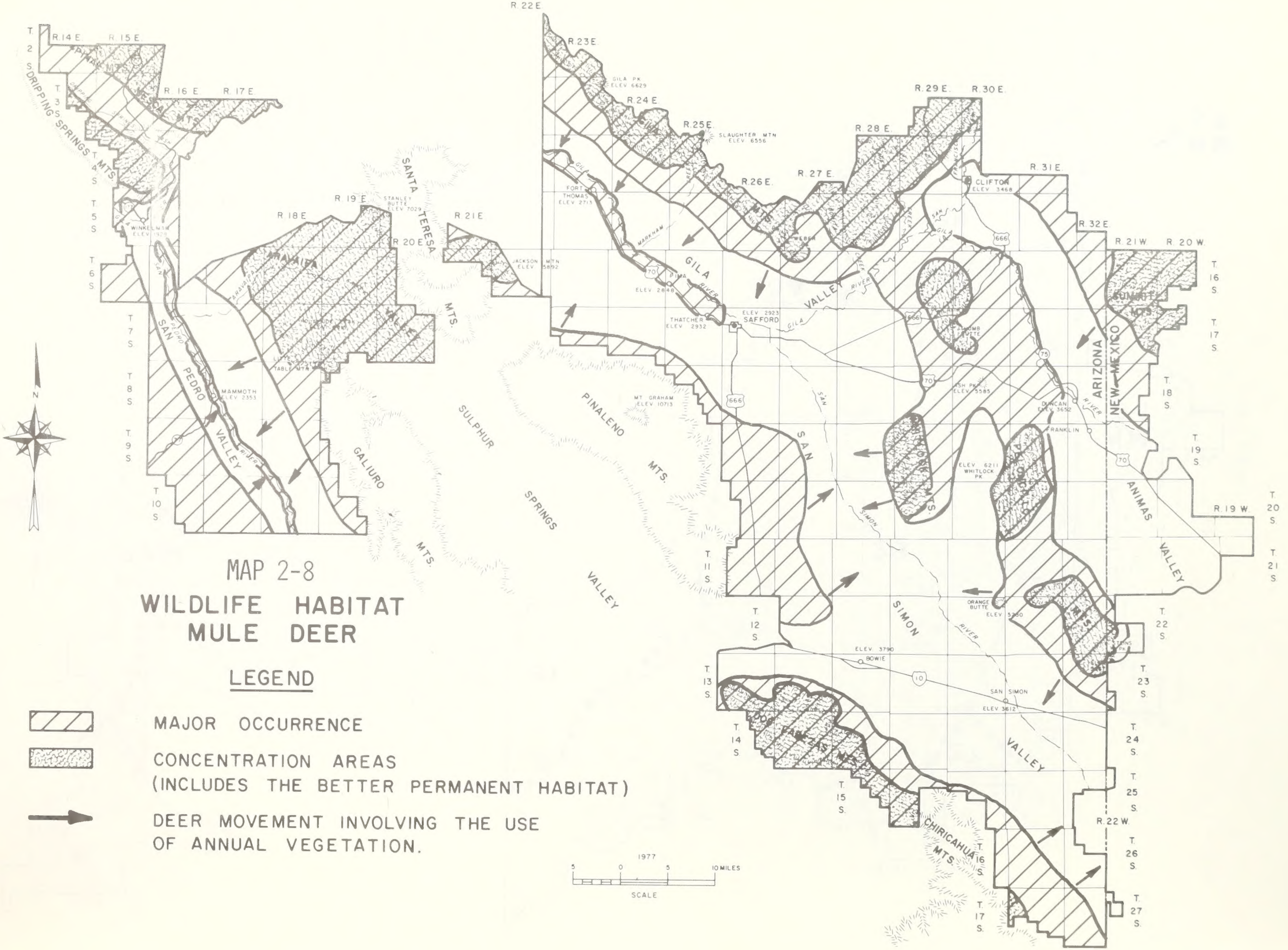
Source: Based on Arizona Game and Fish Department (AG&FD) wildlife population data except where otherwise indicated.

Note: No estimates for small game and other wildlife populations are available from AG&FD or any other source.



MAP 2-7

ARIZONA GAME AND FISH MANAGEMENT UNITS



MAP 2-8

WILDLIFE HABITAT MULE DEER

LEGEND

MAJOR OCCURRENCE

CONCENTRATION AREAS (INCLUDES THE BETTER PERMANENT HABITAT)

DEER MOVEMENT INVOLVING THE USE OF ANNUAL VEGETATION.

ANIMALS

Major permanent mule deer habitat includes the desert mountain ranges. Mule deer use lower desert areas when sufficient moisture allows the growth of annual vegetation. In addition, deer use desirable shrub species, such as jojoba and calliandra, in desert shrub communities. (See map 2-3 and the description of vegetation types in chapter 2.) Mule deer also use desert vegetation where various species of cacti and leguminous shrubs provide fruits and seeds as forage. The highest mule deer concentrations have been observed in the Dos Cabezas Mountains and on several small tracts of public lands near Klondyke.

Deer habitat condition is generally poor throughout the ES area and particularly in AG&FD unit 28. AG&FD unit managers most often cite low rainfall, predators, and a variety of man's activities as the reasons for the poor condition. Forage conditions vary from poor to fair at the lower and midelevations and are especially poor near water. In the higher more rugged mountain areas, forage condition is generally better, because of the higher precipitation levels. Sizable areas within the Gila and Dos Cabezas Mountains, however, are in unsatisfactory condition (map 2-6). Although overall forage condition is better at the higher elevations, portions of the deer habitat remain in poor condition. Portions of these areas, such as the Black Hills and the Peloncillo and Mescal Mountains, are in better forage condition but are devoid of water or lack water during dry periods when forage and water are most needed.

The annual use of range vegetation by livestock on many of the grazing units in the ES area has been excessive and has resulted in competition between deer and livestock. Moreover, competition is intensified by the present poor range condition, high annual use of vegetation, frequent dry periods, and yearlong use of the range by both livestock and deer.

Periods of severe competition between livestock and deer vary with elevation and available moisture. Generally competition at the higher elevations (above 5,500-6,000 feet) is greatest in winter and particularly during February and March, since most plants are dormant and deer and livestock browse on evergreen shrubs (Anthony, 1972). At the lower elevations where browse is less abundant the hot dry period (April through July) is more critical. In these areas forage has been subjected to grazing throughout the year, and most of it is dry just before the summer rainy season when most of the year's forage is produced. Regardless of elevation, livestock and deer compete where amounts of palatable browse are limited.

Deer and livestock compete in the ephemeral areas (lower desert types), but competition varies with rainfall and the production of annual forage. When few annuals are produced, cattle and deer compete for available annuals and the relatively few palatable perennial plants that usually occur along desert washes and on northerly exposures. At this time livestock eat many plants that range managers generally consider to be low in palatability.

Deer and cattle also compete heavily in the relatively small areas of the desert scrub-grassland ecotones, where certain shrubs, such as jojoba and calliandra, remain.

White-tailed Deer. The present occurrence of the Coues' whitetail in the area is limited (map 2-9). Whitetail densities range from two to three animals per square mile in mountain shrub to less than one animal per square mile in desert grassland. The largest remaining population of these animals in the ES area occurs in the Dos Cabezas Mountains, primarily above 6,500 feet. Remnant populations occur in grass-brush areas, primarily next to the rim of Aravaipa Canyon. A few occur along the ES area boundary line in the Gila Mountains and in scattered tracts in New Mexico.

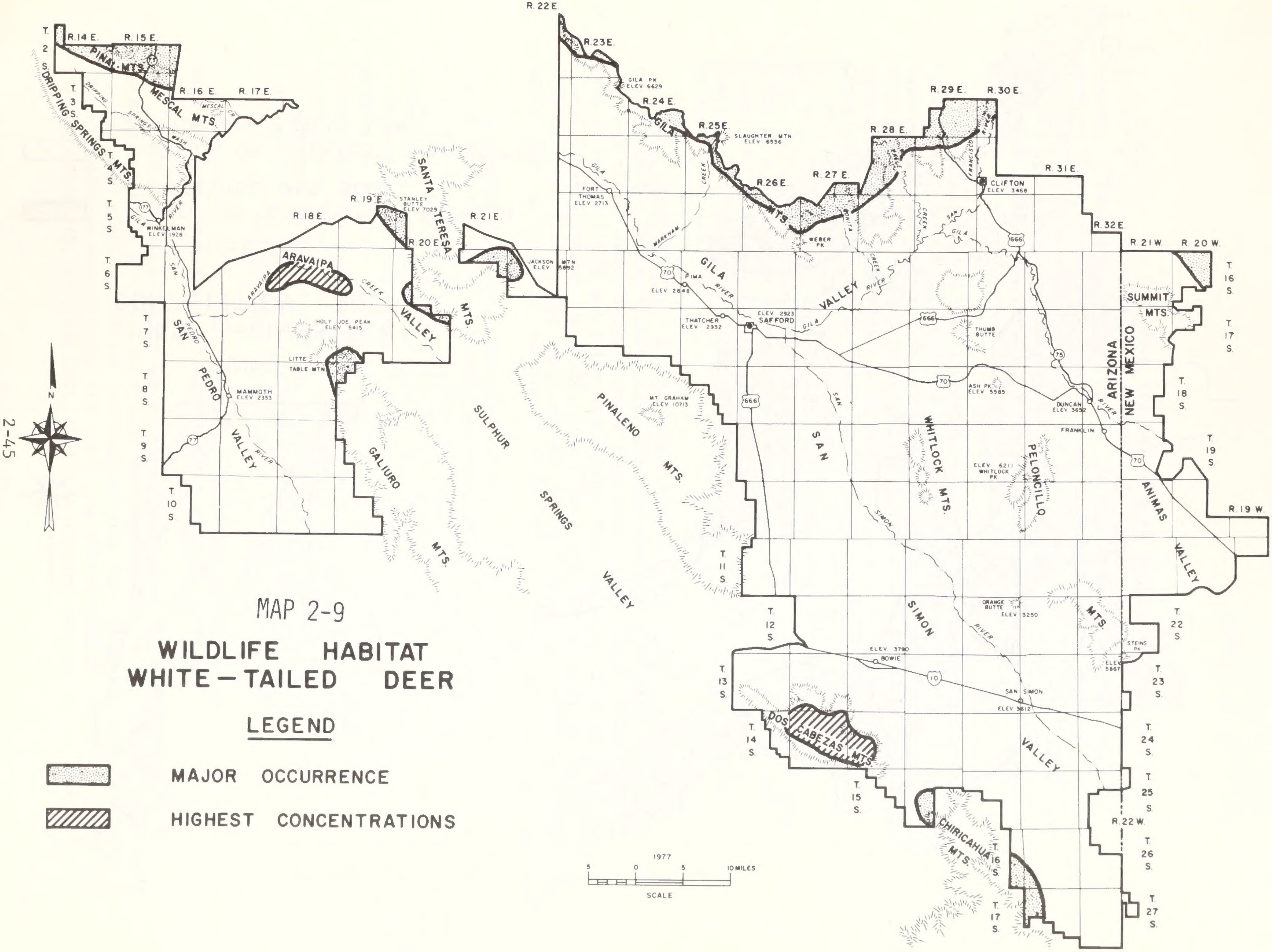
Whitetails have smaller home ranges than do mule deer. They usually occur in localized areas and are not spread over the entire range (Lang, 1957). Heavy range use, therefore, can eliminate whitetails from small preferred areas.

Although white-tailed deer do prefer areas free of livestock use, in some areas, such as the Dos Cabezas Mountains, they can and do tolerate livestock grazing. Deer and livestock compete for food, cover, and space. Livestock and mule deer directly compete for most or all of the white-tailed deer's major food items: Cercocarpus breviflorus, Eriogonum wrightii, Quercus gambelii, Q. hypoloucoides, Artemesia ludeviciana, Celtis reticulate, Bouteloua spp. and others. See Wildlife Inventory and Wildlife Habitat Management Plan for the Dos Cabezas Mountains (on file in the BLM Safford District Office) for more detail. Studies will be initiated to further identify the biological needs of the Coues' white-tailed deer. (See Chapter 4, Mitigation.)

In summary, livestock and deer compete for food throughout most of the deer habitat. Exceptions include small mountainous areas where terrain and limited water preclude intense livestock grazing (map 210).

During a year's grazing period (except for very wet years) livestock and deer competing for desirable plants use nearly 100 percent of available forage in many areas. Such competition removes all or most of the current year's production from palatable species, and range animals revert to less palatable plants. Often they remove more than the current year's vegetation production from palatable and even less desirable species next to water.

Assessment of the future potential for improved condition and production is difficult because of a lack of comparison areas for judgement and because widespread erosion has changed the basic soil resource. This change in turn affects anticipated plant recovery.



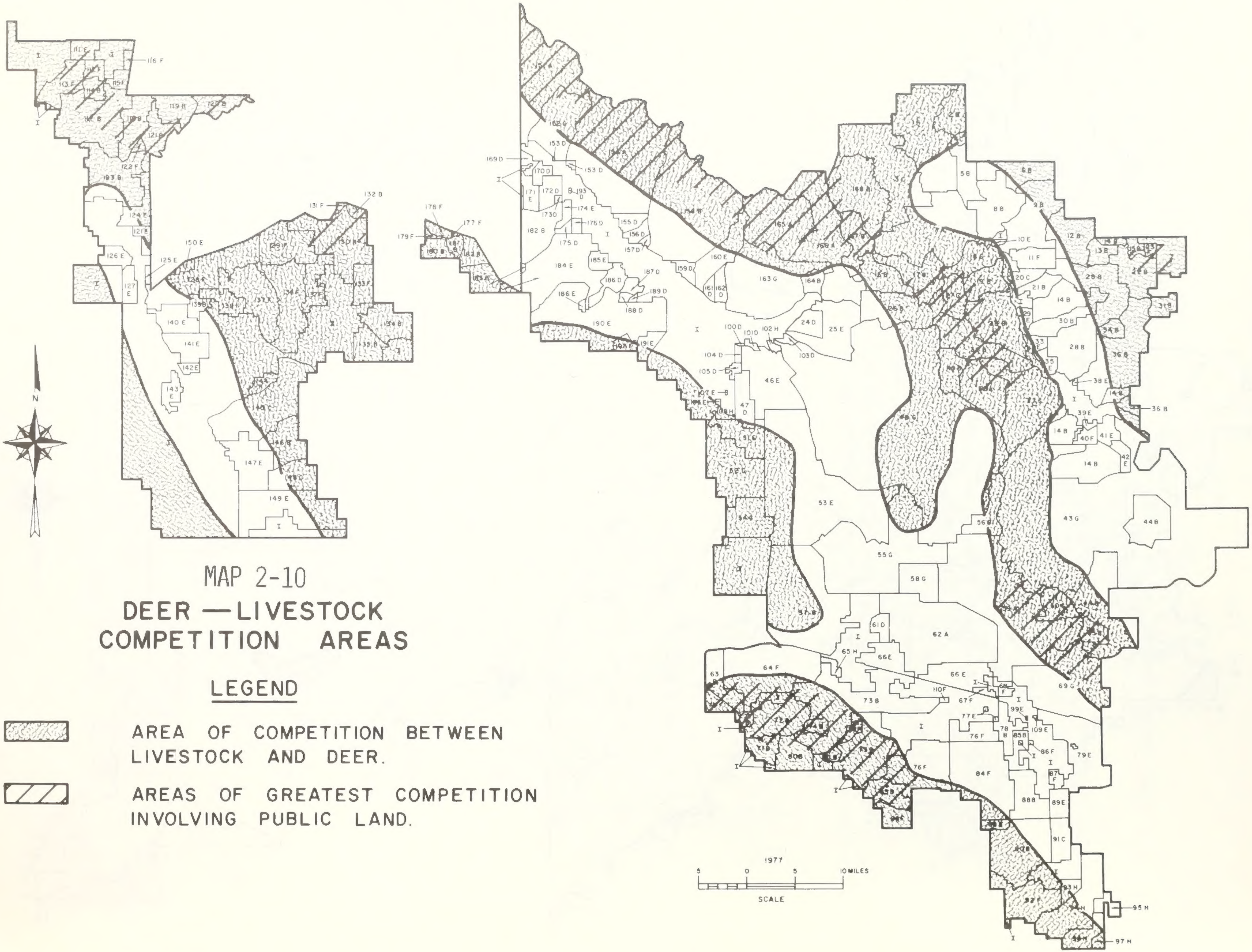
MAP 2-9

WILDLIFE HABITAT WHITE-TAILED DEER

LEGEND

MAJOR OCCURRENCE

HIGHEST CONCENTRATIONS



MAP 2-10

DEER — LIVESTOCK COMPETITION AREAS

LEGEND

AREA OF COMPETITION BETWEEN LIVESTOCK AND DEER.

AREAS OF GREATEST COMPETITION INVOLVING PUBLIC LAND.

Javelina. The javelina, the second most important big-game species in the ES area, is widespread in the area, ranging from the river bottoms to the mountains (map 2-11). In some areas of desert scrub as many as three to six javelina may occur in a square mile, whereas javelinas may use some pinyon-juniper habitat only seasonally. Favored habitat types include stands of succulent vegetation, particularly Engelmann prickly pear, with the appropriate shelter of nearby caves and overhangs.

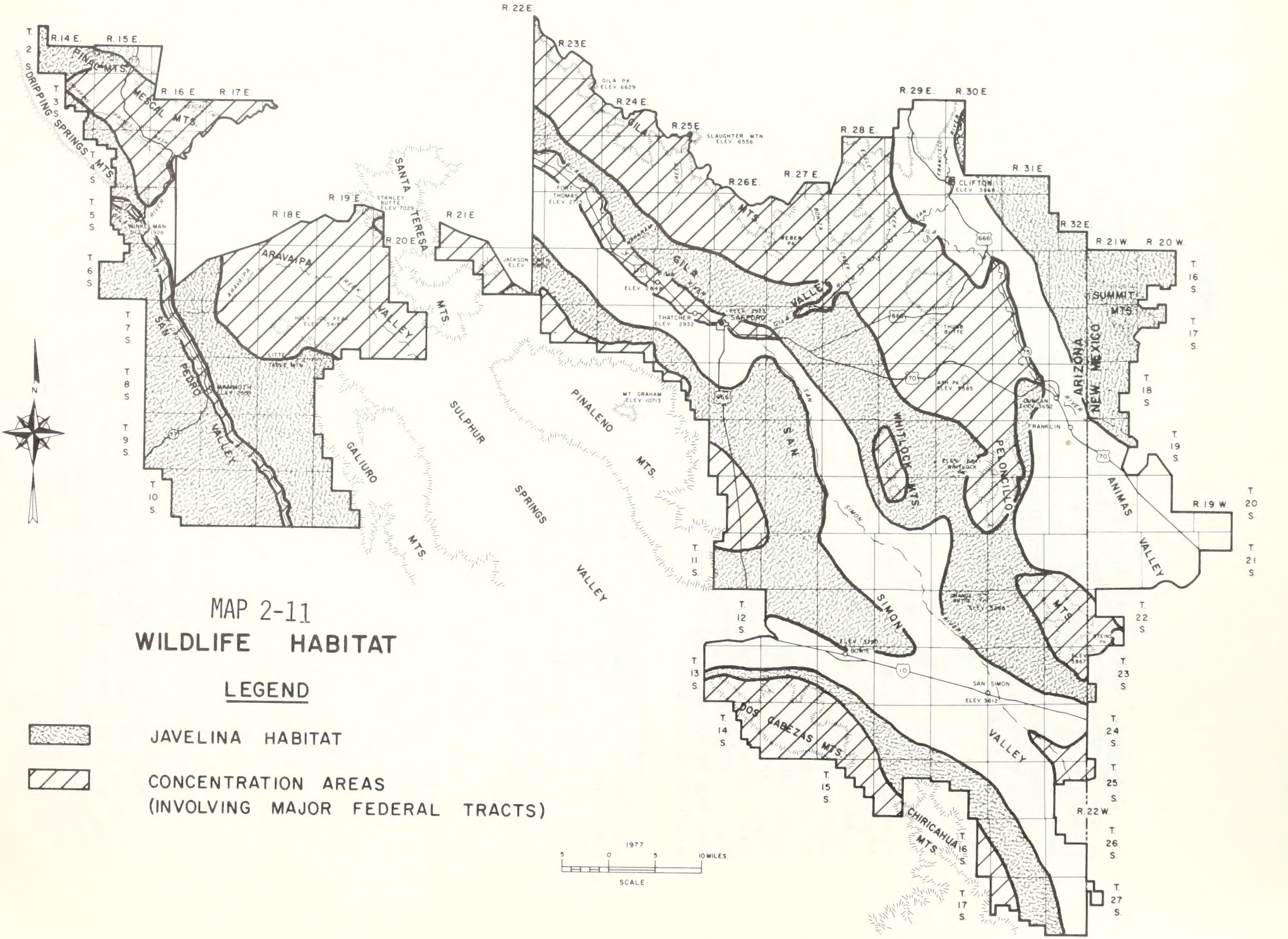
Javelina compete with livestock for forage but not to as great an extent as do deer. Apparent food preferences and ability to use a variety of cacti make the javelina better able to exist under intensive livestock grazing. Where heavy grazing has contributed to the spread of padded cacti, the distribution of javelina has probably increased. Conversely, when forage is scarce and livestock are forced to feed on prickly pear cactus, competition occurs. Intensive competition for these cacti, however, is not evident as a widespread problem in the area. Javelina forage on the herbage, roots, tubers, bulbs, and fruiting parts of a variety of perennial and annual plants (Donaldson, 1967 and Knipe, 1956). Livestock and javelina also compete where livestock grazing is intense and during periods of low rainfall when vegetation production is low.

Rocky Mountain Elk. A small herd of elk, which ranges primarily on the San Carlos Indian Reservation, has been observed periodically on adjacent public lands during winter (map 2-12). Elk areas include the head of Mescal Creek and a limestone ridge that forms the east side of Mescal Creek (grazing units 118, 119, 121). Competition between elk and livestock on these public lands appears to be relatively low and infrequent. AG&FD does not authorize hunting of these elk.

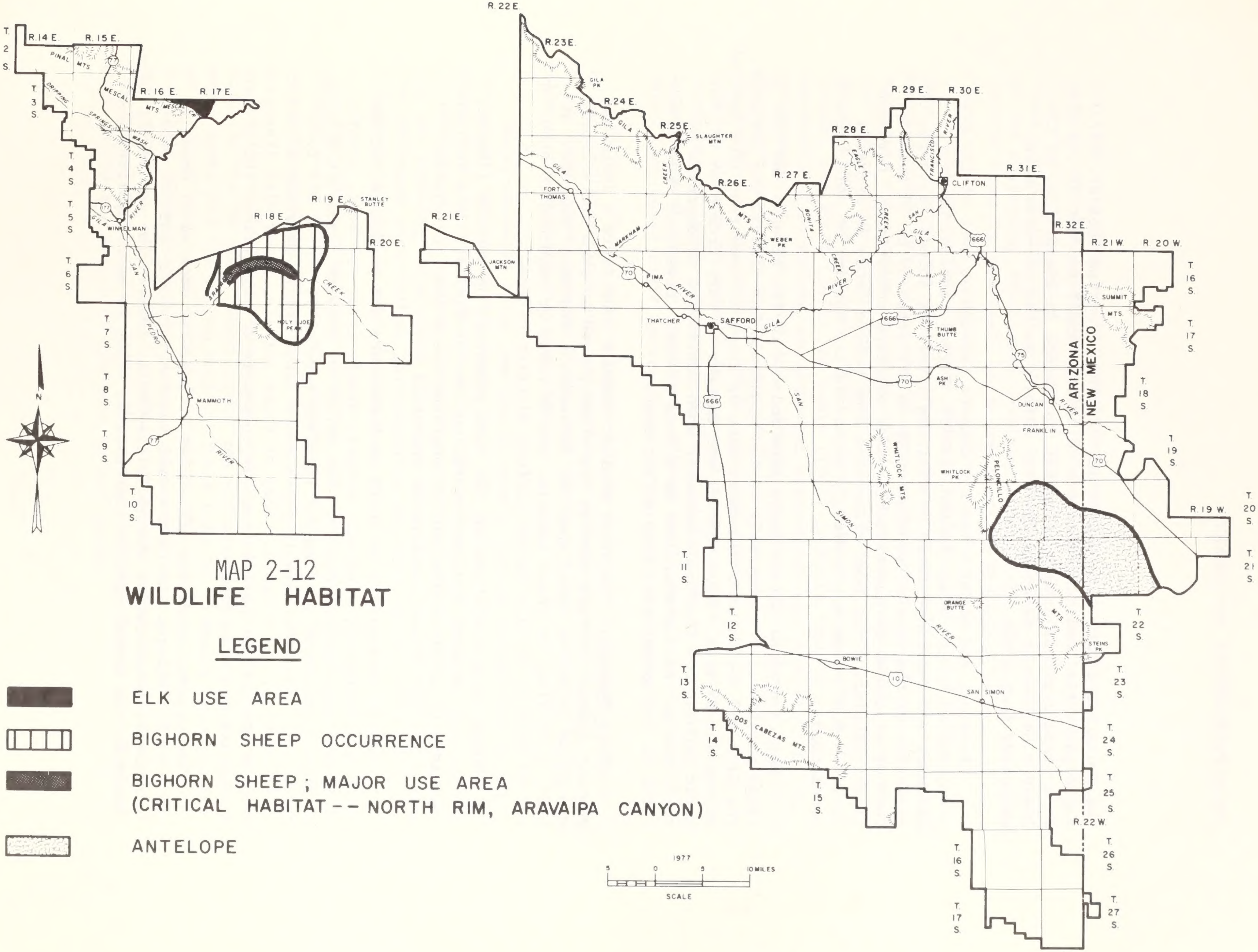
Pronghorn Antelope. Antelope presently occur at one location in the ES area (map 2-12). A small herd and often only individuals use a grassland area next to the eastern slope of the Peloncillo Mountains along the Arizona-New Mexico State line (grazing units 43 and 44). AG&FD (1976c) estimated the herd to include not more than 20 animals and to be stable. On the basis of BLM observations, however, this estimate appears to be high. Livestock and antelope are most likely to compete during periods of low rainfall, especially in late spring until summer rains begin, usually in July. Competition usually occurs on both forbs and grasses. Antelope will use about one-third grasses, one-third forbs, and one-third shrubs (BLM Manual 6610). The AG&FD does not authorize hunting for these antelope.

Bighorn Sheep. With the BLM and AG&FD goal of establishing a wild bighorn sheep population throughout their historical habitat.

AG&FD in 1958 began transplanting bighorn sheep into a 112-acre holding enclosure on State land near Aravaipa Canyon. AG&FD subsequently has released bighorn into the surrounding area (map 2-15). The heaviest bighorn use area occurs along the north rim of Aravaipa Canyon within grazing units 129, 136, and 137. The best bighorn habitat occurs along



MAP 2-11
WILDLIFE HABITAT



MAP 2-12
WILDLIFE HABITAT

LEGEND

ELK USE AREA

BIGHORN SHEEP OCCURRENCE

BIGHORN SHEEP; MAJOR USE AREA (CRITICAL HABITAT -- NORTH RIM, ARAVAIPA CANYON)

ANTELOPE

the rim areas of Aravaipa Canyon and its feeder system (Weaver, 1970). Although public lands constitute a relatively small percent of the area (see plate 1), this area's potential importance is exemplified by the AG&FD's ability to maintain 13 to 15 animals in the 112-acre sheep enclosure (map 2-12).

Livestock and bighorn heavily compete throughout most of the area now occupied by the sheep (AG&FD, 1976c). Rugged terrain, however, somewhat reduces competition by limiting livestock access, allowing the expansion of the present population to an estimated 30 to 35 animals. Further expansion is questionable under existing conditions. Permanent livestock grazing has been eliminated from public lands in Aravaipa Canyon. AG&FD does not presently authorize the hunting of this bighorn population.

Mountain Lion. Lions range into and out of the ES area and over a large portion of it, primarily in the mountains but also in the lowlands. The Gila and Dos Cabezas Mountains make up the most important lion habitat within the ES area. Lion numbers are thought to vary from 8 to 12, but their populations fluctuate somewhat when adults are accompanied by their young. Lion prefer deer as a food source. Livestock thus affect lions to the extent that they affect deer.

Small Mammals. The other smaller mammals constitute a large and diverse fauna. Certain members are often placed in such nontaxonomic groups as predators, prey species, furbearers, and small mammals. A list, including all these mammals, either known or expected to occur in the ES area is on file in the Safford District office.

Numerous bats are present and feed primarily on insects (Ingles, 1954). Most insects feed on vegetation, and preliminary data indicate that insects are more abundant in ungrazed areas than in adjacent grazed areas. (See discussion of insects.)

Mammals catagorized by AG&FD as furbearers and predators include raccoon, coatimundi, ringtail, badger, skunks (four species), coyote, gray fox, kit fox, and bobcat. The effect of present livestock grazing on these mammals is complex and involves several levels of the food chain. For food the mammals depend to a large degree on rodents, other small animals, and insects. Many of these animals, along with livestock and the other large herbivores, are consumers of vegetation, the primary productivity of the range.

The present condition of habitat is good for some small mammals and poor for others. Certain mammal species increase, whereas others decrease with vegetation change (Dick-Peddie, 1976). The net result is a change in the mammal species composition. This is most important when one considers that our southwestern grasslands and associated wildlife species have been diminishing for the past century due to overgrazing, fire suppression, and a variety of other factors. The importance of the remaining populations of grassland associated animal species increases as the supporting grasslands continue to diminish. This same biological fact is true for the small birds and reptiles discussed below.

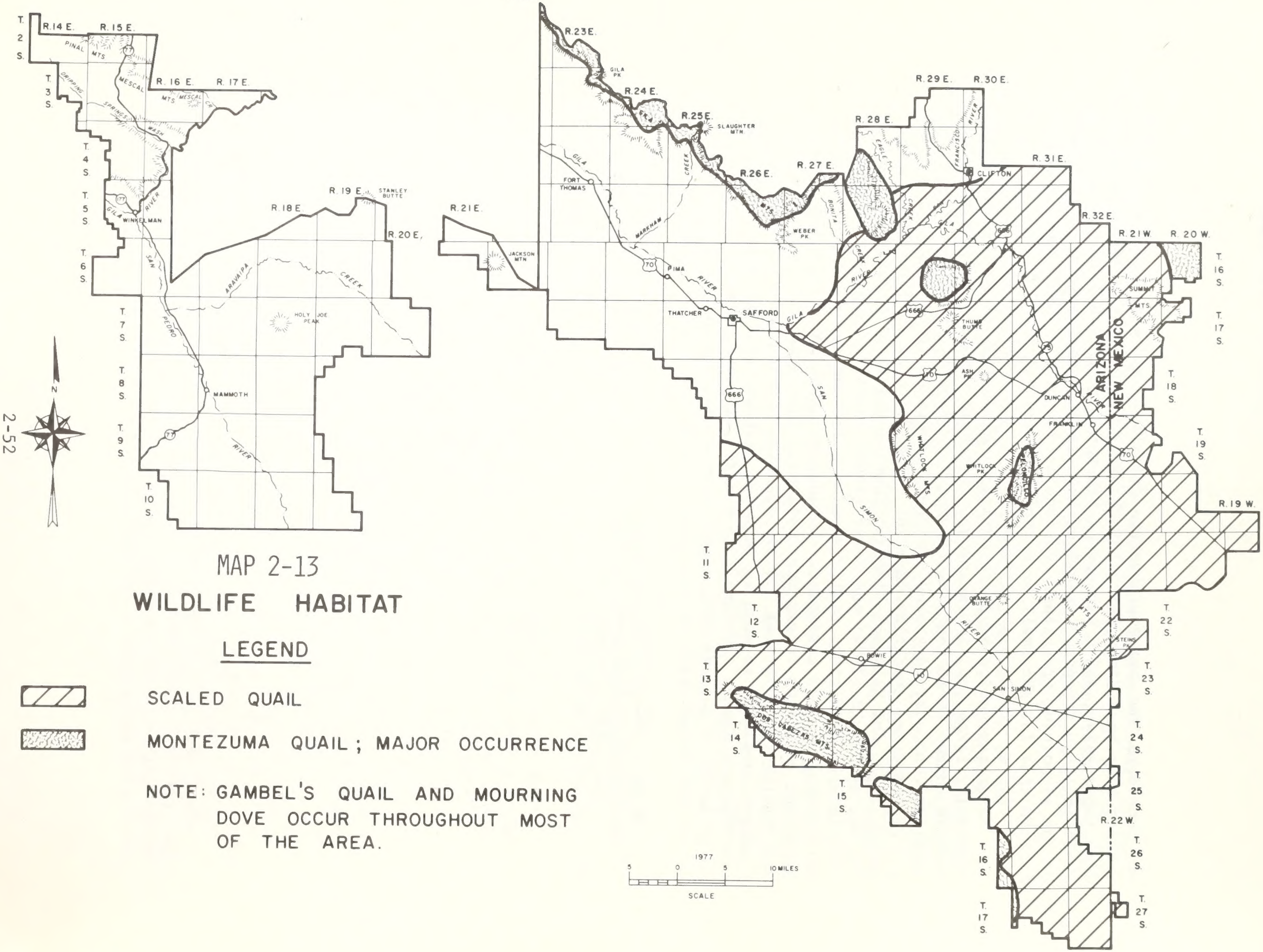
Major categories of small mammals include rabbits and rodents, an especially large and diverse group. Research reveals that certain small mammals common throughout the ES area (jackrabbits, kangeroo rats, woodrats, and certain ground squirrels) increase under heavy range use and deteriorated condition (Martin, 1975; Ellison, 1960; Stoddard and Smith, 1955; and Kalmbach, 1948). These authors, along with Herbel, Steger, and Gould (1974) and Lewis (1969) indicate that on ranges in deteriorated condition, small-mammal populations can contribute to the maintenance of poor condition. Semidesert grass-shrub ranges in good to excellent condition rarely have serious rodent problems (Martin, 1975; and Buffington and Herbel, 1963), although Anderson (1972) found a greater biomass of rodents in ungrazed pastures than in grazed acres in southwestern Idaho. Adversely or beneficially, the present situation of large areas of heavily used range affects small mammal populations, since they spend their entire lives within small home ranges.

Birds. The ES area supports a large and diverse avifauna, which is often subdivided into such categories as waterfowl, shorebirds, birds of prey, game birds, nongame birds, and others. A comprehensive list is on file at the Safford District office.

Water-oriented birds use the ES area's limited waters mostly for "stopover" resting during migration. The killdeer does nest next to water throughout much of the area. The majority of habitat is provided by numerous small earthen livestock watering "tanks", which frequently dry up, exposing large areas of barren shoreline. Major exceptions are the permanent waterbodies, particularily the Gila River, where concentrated livestock grazing is most detrimental.

Many birds other than waterfowl and shorebirds drink at stock tanks holding water. Moreover, the major waterbodies are important sources of permanent drinking water for numerous wildlife species.

Both resident and nonresident species of hawks, eagles, and falcons occur in the ES area. Most common and widespread are the red-tailed and marsh hawks and the golden eagle. These raptors, commonly referred to as birds of prey, feed on a wide variety of birds, reptiles, insects, and small mammals and are primarily affected by the populations of their prey species. Concentrated grazing in riparian areas is especially detrimental to the black hawk. Mortality to birds of prey from lack of prey during any season of the year is not known.



MAP 2-13

WILDLIFE HABITAT

LEGEND

SCALED QUAIL

MONTEZUMA QUAIL; MAJOR OCCURRENCE

NOTE: GAMBEL'S QUAIL AND MOURNING DOVE OCCUR THROUGHOUT MOST OF THE AREA.

Livestock grazing affects these birds to varying degrees involving two habitat components--food and cover. Because quail and doves spend all or a major portion of their lives feeding and rearing their young on the ground, ground level vegetation is especially important to them. Quail spend their entire lives in relatively small areas. Size varies with the quality of the habitat. During daily movements, scaled quail may wander over an area half a mile across or may restrict themselves to 40 acres or less. Ordinarily they spend their entire lives within an area of only 2 or 3 square miles (Campbell, 1967). Gambel's quail are more restrictive, concentrating in and near desert washes and waterways. Therefore large areas of heavy grazing are detrimental to these game birds. Montezuma quail occur in low numbers in several mountain locations and are highly dependent upon stands of climax grass (Brown, R. L., 1971).

Although the majority of nongame birds now present are associated with the upper levels of vegetation (i.e., shrubs and trees as opposed to grassland ground cover), many forage for seeds and insects on the ground. Heavy livestock grazing that removes all or most of the seedheads from grass and forbs over broad areas appears to create food shortages for many rangeland birds. Insect populations are also lower in grazed than in ungrazed areas.

Nongame bird diversity is great when one considers permanent, summer, and winter residents; transitory species; and the variety of habitats. Diversity as well as densities vary with habitat type (vegetation). Breeding bird avifaunas are relatively simple. Although an average of 20 to 35 species was recovered from roadside counts in desert vegetation areas of the West and Southwest (Peterson, 1975), these figures appear to be high for much of the open desert shrub vegetation within the ES area. Breeding bird densities also vary with vegetation type. Densitites are usually lowest in the open desert shrub and greatest in the riparian vegetation types. Heavy grazing in riparian areas (with the exception of Aravaipa Creek) has not only removed ground cover vegetation but has virtually stopped the development of highly desirable overstory trees, such as cottonwood and willow. The importance of these trees is exemplified by the report of 15 species of birds foraging at one time in a single cottonwood tree (New Mexico Interagency Study, 1974). Cotton-wood stands and individual trees also provide nesting sites far in excess of the area they occupy (table 2-10).

The present condition of the habitat is good for some birds and poor for others. Certain mammal species increase shereas others decrease with vegetation changes (Dick-Peddie, 1976). The net result is a change in the bird species composition. (See statement under mammals for further comments).

Reptiles and Amphibians. Of the 65 to 70 reptile species (varies with taxonomic breakdown) and 13 amphibian species occurring in the ES area, those most affected by present grazing are associated with water

TABLE 2-10
A COMPARISON OF BREEDING BIRD DENSITIES IN SELECTED SOUTHWESTERN HABITATS

Habitat Type (community)		Breeding Bird Density Males/40 ha
Riparian Deciduous Forest		
Mixed Broadleaf	Balda (1967)	304
Mixed Broadleaf	Carothers et al. (1974)	332
Cottonwood	Carothers et al. (1974)	847
Temperate Woodland		
Pinyon-Juniper	Hering (1957)	33
Pinyon-Juniper	Beidleman (1960)	30
Encinal	Balda (1967)	224
Subtropical Woodland		
Mesquite Bosque (Riparian)	Gavin and Sowls (1975)	476*
Temperate Grassland		
Mixed Grass	Balda (1967)	64
Desert Grassland		
Yucca/Grassland	Balda (1967)	31
Chihuahuan Desert Scrub		
Creosotebush	Raitt and Maze (1968)	8.5-17.7
Sonoran Desert Scrub		
Paloverde/Sahuaro	Tomoff (1974 and personal communication)	105-150

* Average density for April and May, the height of breeding activity in the mesquite bosque.

Source: Carothers and Johnson, 1976.

as the western box turtle, eastern fence lizard, western hog-nosed snake, hook-nosed snake, massasauga snake and others spend most of their lives within small areas, and are adversely affected by concentrated livestock use next to water and in grasslands. Species other than these highly dependant upon water and grass will also be affected but probably to a lesser degree.

The present condition of the habitat is good for some reptiles and poor for others. Certain species increase, whereas others decrease as a result of vegetative change. (See statement under mammals for further comments).

Aquatic and Riparian Habitat

Aquatic areas with associated riparian vegetation comprise crucial wildlife habitat. Jahn and Trefethen (1972) stated that "regardless of species, riparian vegetation is the most valuable wildlife habitat in Arizona." Carothers and Johnson (1975) recommended that "riparian habitat should be managed as the most sensitive and productive (habitat) in North America." The importance of remaining aquatic areas in southern Arizona cannot be overstated. For example, of approximately 530 miles of the Gila River that once flowed across southern Arizona, only about 24 miles within the ES area remain relatively unaltered.

Fish. Habitat for fish includes the Gila River and its major tributaries (San Francisco River, Eagle and Bonita Creeks), Aravaipa Creek, portions of Markham and Apache Creeks, and a few livestock water tanks. Of the 19 species of fish now known to occur, 7 are natives, and 12 are introduced. The native fishes consist of minnows and suckers. Concentrated grazing, including the trampling and removal of stream bottom vegetation, is detrimental to fish (Minckley, 1973).

Aravaipa Creek. BLM administers approximately 8 miles of Aravaipa Creek (in Aravaipa Canyon) for wildlife. This area provides habitat for a great variety of wildlife, especially for fish and birds (Barber and Minckley, 1966).

Gila Riverine Complex. The Gila riverine complex includes portions of the Gila River (27 miles), San Francisco River (6 miles), Eagle Creek (0 miles), and Bonita Creek (6 miles). Mileages given are for land administered by BLM. The Gila River is the main riverine area into which other permanent waterways drain to form an aquatic and riparian complex.

The riverine complex is large; access to much of it is difficult; and scientific data are lacking. A large-scale biological resource inventory is in progress. Data obtained will be used to better determine what is present but, more importantly, to learn more of the area's potential. The inventory will result in recommendations for improved resource management.

A preliminary list of wildlife of the Gila River complex (containing 19 fish, 13 reptiles, 100 birds and 19 mammals) is on file in the Safford District office. Many other species can be expected in the area.

The Gila riverine complex is rare in the desert Southwest for its water alone. Even though limited data indicate the area is presently in a poor overall condition, the complex provides habitat for numerous wildlife species, including threatened, endangered, and special interest species. Though in its present condition it is important for its resident wildlife populations and a great variety of transient birds, the area could undergo substantial improvement.

Springs. In addition to the more permanent rivers and creeks, springs occur throughout the ES area. The amount of water and vegetation associated with springs varies. Some of the springs do not flow during dry periods. Natural spring areas are crucial wildlife habitat or have the potential to be so. Springs provide habitat diversity and drinking water, which are essential for wildlife and particularly important where they evolve in arid environs. Present habitat condition at most spring areas is poor because of concentrated livestock use.

Two spring areas are known to contain minnows. Minnows, believed by University of Arizona personnel to be speckled dace, occur in the left hand fork (heading upstream) of Markham Creek (grazing unit 154). The minnow population appears to be stable although streamside vegetation is in poor condition.

A small population of longfin dace is present in a small pool on private land in Apache Creek (grazing unit 12). During wet periods, however, water flows to nearby public lands.

Washes and Drainages. Many washes and drainages occur in all vegetation types throughout the ES area. Water varies from semipermanent seepage to strictly storm runoff. Vegetation varies with the amount and permanancy of water and with elevation. Vegetation in these waterways and immediately next to them is usually better developed than the vegetation of the surrounding area. Plants are more vigorous. A greater species diversity and often a greater density occur and plant phenologies are somewhat different from those in the surrounding area. These differences in vegetation and in some cases in the availability of semipermanent water make drainages important concentration areas for increased wildlife activity (Tomoff, 1974; and Raitt and Maze, 1968) and livestock use. The condition of the vegetation in the majority of these areas is poor.

Endangered and Threatened Wildlife Species

The following species appearing on the U.S. Department of Interior, endangered and threatened species list, September 30, 1976, the Arizona Game and Fish Department, threatened wildlife of Arizona list, January 1976, or *Handbook of Species Endangered in New Mexico*, 1977, are known to occur or could be expected to occur in the ES area.

ENDANGERED AND THREATENED ANIMAL SPECIES

Mammals

1. Black-tailed Prairie Dog (Cynomys ludovicianus arizonensis), AG&FD, Group I, not known to occur at present, last known occurrence early 1970s, near Summit, New Mexico, grazing unit 43.

2. Mexican Wolf (Canis lupus), Federal list, endangered, AG&FD, Group I, may occur sporadically in Aravaipa Valley, Aravaipa Canyon Primitive Area.

3. Desert Bighorn Sheep (Ovis canadensis mexicanus), AG&FD, Group III, Aravaipa Canyon Primitive Area, including grazing units 128, 129, 136, 137.

Birds

4. Black-crowned Night Heron (Nycticorax nycticorax), AG&FD, Group III, desirable permanent habitat does not occur; observed sporadically in major water courses including Aravaipa Creek and Gila and San Francisco Rivers.

5. Snowy Egret (Egretta thula), AG&FD, Group III, desirable permanent habitat not present; occurs sporadically in major water courses including Aravaipa Creek and Gila and San Francisco Rivers.

6. Black-bellied Tree Duck (Dendrocygna autumnalis), AG&FD, Group III, recent occurrence within ES area on AG&FD land at permanent ponds, Cluff Ranch; no other occurrence known.

7. Mexican Duck (Anas platyrhynchos diazi), Federal list, endangered, AG&FD, Group III, desirable nesting habitat does not exist; observed sporadically in low numbers along San Simon River drainage, grazing units 55, 58, 62, may occur along Upper Gila River.

8. Zone-tailed Hawk (Buteo albonotatus), AG&FD, Group III, present in low numbers primarily in Aravaipa Canyon and side drainages; may occur near upper Eagle and Bonita Creeks.

9. Black Hawk (Buteogallus anthracinus), AG&FD, Group III, fairly common in Aravaipa Canyon Primitive Area, upper Gila River, and Bonita and Eagle Creeks.

10. Gray Hawk (Buteo nitidus), AG&FD, Group II, not known to occur at present; most likely to occur in Aravaipa Canyon.

11. Southern Bald Eagle (Haliaeetus leucocephalus), Federal list, endangered, AG&FD, Group II, winter-early spring observations only in upper Gila River, Bonita and Eagle Creeks, and vicinity.

12. Osprey (Pandion haliaetus carolinensis), AG&FD, Group III. Occurs in low numbers, upper Gila River, Bonita and Eagle Creeks, and vicinity, and on AG&FD lands within ES area.

13. Peregrine Falcon (Falco peregrinus anatum), Federal list, endangered, AG&FD, Group II, occurs in low numbers, upper Gila River, Aravaipa Creek, and throughout open range.

14. Buff-breasted Flycatcher (Empidonax fulvifrons), AG&FD, Group II, may occur in the riparian vegetation in sycamore trees; most likely occurs as a transient.

Birds (continued)

15. Beardless Flycatcher (Camptostoma imberbe), AG&FD, Group IV, occurs in Aravaipa Canyon Primitive Area.

16. Bells' Vireo (Vireo bellis), Handbook of Spp. Endangered in New Mexico. Occurs primarily in riparian vegetation throughout ES area.

17. Gila Woodpecker (Melanerpes uropygialis uropygialis), Handbook of Spp. Endangered in New Mexico, occurs primarily in riparian vegetation throughout ES area.

Reptiles and Amphibians

18. Green Toad (Bufo debilis), AG&FD, Group IV, distribution poorly known, Soapweed Tank, grazing unit 48; observations near Portal, Arizona, distribution includes grasslands of southeast portion of ES area.

19. Gila Monster (Heloderma suspectum), AG&FD, Group III, wide distribution throughout ES area below 5,500 feet elevation.

20. Desert Tortoise (Gopherus agassizi), AG&FD, Group III, occurrence poorly known; distribution includes western portion of ES area next to San Pedro River, in palo verde-saguaro plant associations; may occur in same vegetation next to Dripping Springs Wash; one unconfirmed sighting in Bear Springs Canyon, grazing unit 137.

21. Green Rat Snake (Elaphe triaspis), AG&FD, Group IV, observed near Fort Bowie National Historical Site, grazing unit 75; may also occur in Dos Cabezas Mountains.

22. Western Massasauga (Sistrurus catenatus), AG&FD, Group IV, one observation 21 miles east of Safford; most likely occurs in low numbers in grassland associations in southeastern portion of ES area.

23. Rock Rattlesnake (Crotalus lepidus), AG&FD, Group IV, observations from Dos Cabezas Mountains, grazing units 72, 73, 74, 80 and other adjacent grazing units; could occur in Whitlock and Peloncillo Mountains.

24. Twin-spotted Rattlesnake (Crotalus lepidus), AG&FD, Group IV, observations not fully confirmed; could occur in Dos Cabezas Mountains and northern Peloncillo Mountains.

Fish

25. Loach Minnow (Tiaroga cobitis), AG&FD, Group II, occurs in Aravaipa Creek, Aravaipa Canyon Primitive Area; could occur in Eagle Creek and San Franciso River.

26. Round-tailed Chub (Gila robusta), AG&FD, Group IV, occurs in Aravaipa Creek, Aravaipa Canyon Primitive Area; could occur in Eagle Creek.

27. Spikedace (Meda fulgida), AG&FD, Group IV, occurs in Aravaipa Creek, Aravaipa Canyon Primitive Area.

28. Gila Topminnow (Poeciliopsis occidentalis), Federal list, endangered, AG&FD, Group III, last known occurrence in a spring on private land south of Safford (Minckley, 1975); presence elsewhere unknown.

Insects

Southeastern Arizona has long been known to have a rich insect fauna. A period of collecting from July to August 1976 netted 1,888 insect species. A total of 769 additional species from this area are present in the University of Arizona insect collection. Insects were inventoried in various habitats throughout the ES area to determine occurrence. Samples for comparing insect diversity and density in grazed and nongrazed range were collected both inside and outside seven exclosures.

Little is known of the habitats of the vast majority of insects in this area, and the choice of sampling technique will severely bias any estimation of abundance for some of the species collected. Insects will often have a clumped distribution, which further increases the difficulty in estimating their abundance.

The only known migratory insect in the ES area is the monarch butterfly, *Danaus plexippus*, which neither overwinters nor breeds in this area, but merely passes through on its migratory route. Insect sampling was conducted in several habitats traditionally considered to be restricted, i.e. bat caves and hot springs. All of the insect species found in such habitats, however, could also be collected in other parts of the ES area.

No insect species found in the ES area are on or proposed for the endangered/threatened species list.

Natural History Resources

Paleontological Resources

The paleontological sites identified within the ES area are from the Pliocene and Pleistocene geologic epochs (13 Million to 11,000 years old) (map 2-14). The sites contain fossilized remains of mammals, birds, fish, and reptiles (table 2-11). The Laboratory of Paleontology at the University of Arizona has inventoried approximately half of the sites. Overgrazing has reduced the vegetation cover and accelerated natural geologic erosion. Erosion has then uncovered the fossils, resulting in their being broken, displaced, or lost.

Fourteen sites, ranging in size from 1 to 1,000 acres, and totaling 2,261 acres are within the ES area. Table 2-11 provides a description and grazing unit location for each site.

Geological Resources

The geologic resources identified in the ES area consist of highly erosive Gila Valley lakebed sediments (map 2-14). Overgrazing has contributed to a reduction in the vegetation cover and to accelerated natural geologic erosion (table 2-12)(Knechtel, 1938). Three geologic resource sites totaling 1,800 acres have a value for geologic displays or comparative scientific but lack a high recreation value.

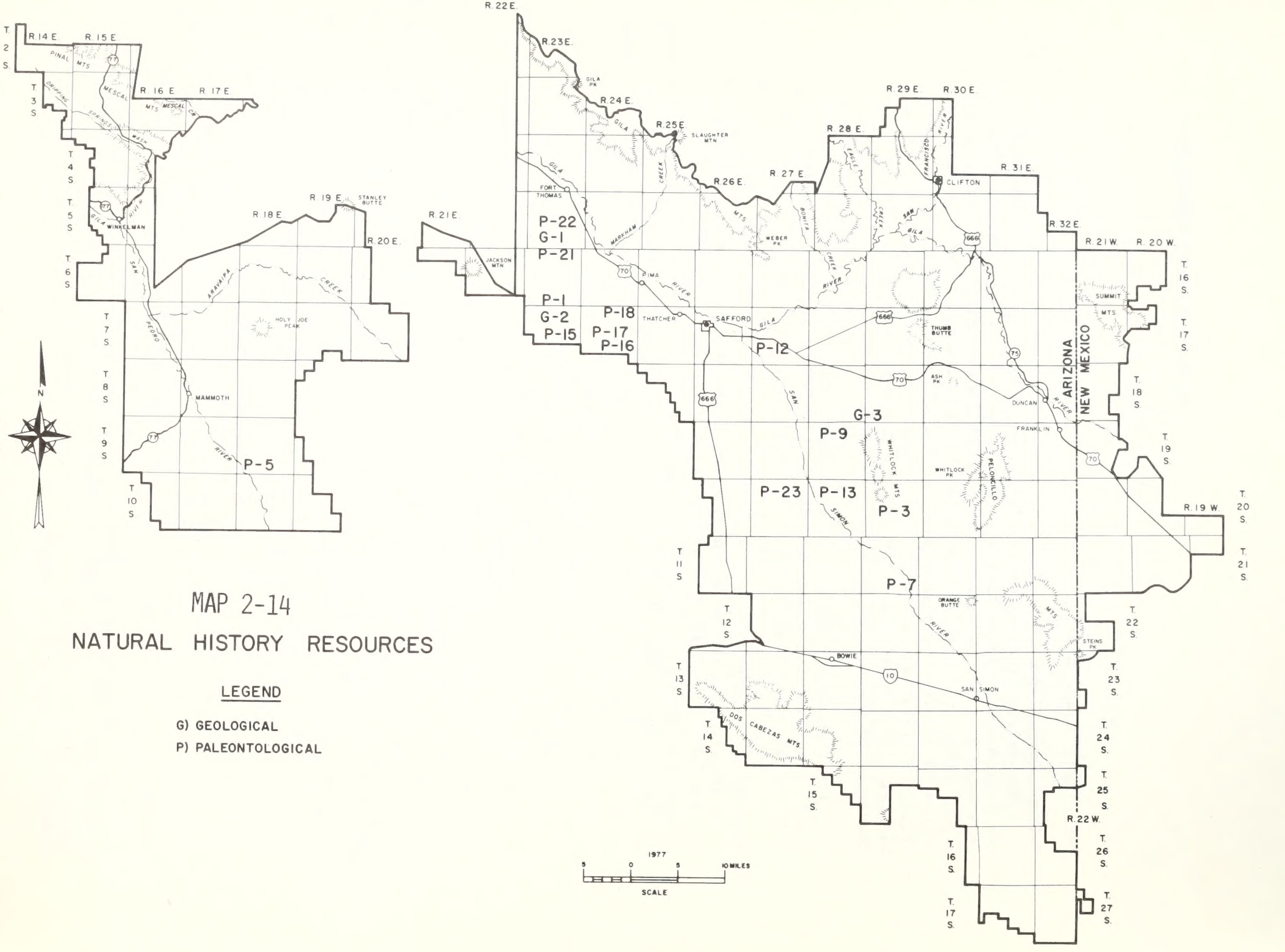
Cultural Resources

The occupation of the ES area spans a period of approximately 10,000 years and consists of a mixture of many culture groups, frequently overlapping in time. The cultural groups occupying the ES area are shown in the following table.

Cultural Groups	Dates
Cochise	8000 B.C. - 100 A.D.
Mogollon	300 B.C. - 1200 A.D.
Hohokam	300 B.C. - 1400 A.D.
Anasazi	1200 A.D. - 1400 A.D.
Salado	1250 A.D. - 1400 A.D.
Sobaipuri	1450 A.D. - 1762 A.D.
Apache	1500 A.D. - Present
Spanish	1540 A.D. - 1821 A.D.
Mexican	1821 A.D. - 1848 A.D.
Intensive settlement	1870's A.D. - Present

Archaeological Resources

Known Archaeological Resources. The present archaeological inventory of the ES area contains 334 recorded sites which are grouped by grazing unit in appendix G. Sites occurring outside grazing units are described at the end of appendix G.



MAP 2-14

NATURAL HISTORY RESOURCES

LEGEND

G) GEOLOGICAL

P) PALEONTOLOGICAL

TABLE 2-11
PALEONTOLOGICAL SITES

Allot- ment No.	Site No. Map Ref- erence	Site Description	Natural Area Eligi- bility	Owner- ship Status	Recre- ation Resource Value*
190	P- 1	Late Pliocene to middle Pleistocene mammal tracks of a probiscidean (<u>Stegomastodon</u>?); a horse (<u>Equus pleiseppus</u>), and a camel. Fossil animals preserved are horse, camels, and antelope. Found in lakebed sediments overlain by highly erosive alluvium outwash material (badlands) west of Pima. (320 acres)	X	Public Lands	A
53	P- 3	Remains of late Pliocene tortoise. One new species discovered in lacustrine (lake) deposits exposed as badlands at south end of Whitlock Mountains. (80 acres)		Public Lands	B
147	P- 5	Five localities containing extinct early Pliocene remains of mouse, dog, bear, mastodon, horse, two types of camels, fish, and birds. May be the principal reference section for defining the chronologic limits of paleomagnetic epoch 5. Located north of Redington. (320 acres)	X	Public Lands	A
58	P- 7	Remains of Pliocene mammals and reptiles. Found in lacustrine sediments exposed as badlands northeast of Bowie near San Simon River. (160 acres)		Public Lands	C
48	P- 9	Twenty-four separate localities containing late Pliocene to middle Pleistocene fossil mammals and reptiles. Sites contain one of the best Blancan Age assemblages of the Southwest and are considered the most significant paleontological sites in the Safford District. Found in lacustrine sediments exposed as badlands on the north end of the Whitlock Mountains. (1,000 acres)	X	Public Lands	A
46	P-12	Excavation site of the remains of a partial mammoth of the late Pleistocene. Found in a gravel bar being eroded by shallow channels south of Safford. (1 acre)		Public Lands	C
53	P-13	Late Pliocene fossil tortoise remains. Found in old lakebed deposits southeast of Safford, east of the San Simon River. (5 acres)		Public Lands	C
190	P-15	Clarendonian or Hemphillian land mammals (including horse, weasel, llama, peccary), and reptiles. Considered one of the most important sites in the Safford District. Found in the Gila conglomerate west of Pima. (15 acres)	X	Private	A
190	P-16	A Clarendonian or Hemphillian land mammal age (Pliocene?) site containing fossil remains of a horse. Found in Gila conglomerate west of Thatcher. (20 acres)		Private	C
190	P-17	An Irvingtonian or Rancholabrean land mammal age (Pleistocene) site containing remains of Reptilia (a tortoise) and Mammalia (a horse and a camel). Found in Safford basin sediments west of Thatcher. (5 acres)		Private	C
190	P-18	An Irvingtonian or Rancholabrean land mammal age (Pleistocene) site containing remains of a cat and a horse. Found in Safford basin sediments west of Pima. (160 acres)		Public Lands	C
184	P-21	A Pliocene to Pleistocene site containing a water snake (<u>Natrix</u>), unidentifiable vertebrate bones, and badly crushed unidentifiable freshwater mollusks. Found in a limestone capped lacustrine sedimentary deposit south of Fort Thomas. (160 acres)		Private	B
174 175	P-22	A Blancan Age (late Pliocene) land mammal site containing fossil remains of a horse and a camel and silicified wood. Located south of Fort Thomas. (5 acres)		Public Lands	C
53	P-23	Pleistocene or earlier site containing petrified reed, wood fragments, silicified plant stems, and opalized ivory. Found in conglomerate overlaid with sandstone, southeast of Safford. (10 acres)		Public Lands	C

*Class A--Excellent, Class B--Good, Class C--Fair.

Quality classes were determined by using BLM Manual 6111, "Quality Evaluation for Recreation Use Opportunities."

TABLE 2-12
GEOLOGICAL FEATURES OF SIGHTSEEING RECREATIONAL VALUE

Allot-ment Number	Map Resource Number	Site Name	Type of Site	Recreation Resource Class Value*	Comments
184	G-1	Red Knolls	Solution cavern	B	Excellent example of water percolating through soils leaving hollows. Part of Gila Valley lakebed sediments. (160 acres)
190	G-2	Bear Springs	Eroded soils	C	Highly eroded crumbly soils creating a bad-lands effect. Part of Gila Valley lake-bed sediments. (640 acres)
48	G-3	North Whitlock Mountains	Diatomaceous earth	C	Fair example of soil formed by diatoms or their secretions. Part of Gila Valley lakebed soils. (1,000 acres)

*Class A--Excellent, B--Good, Class C--Fair.

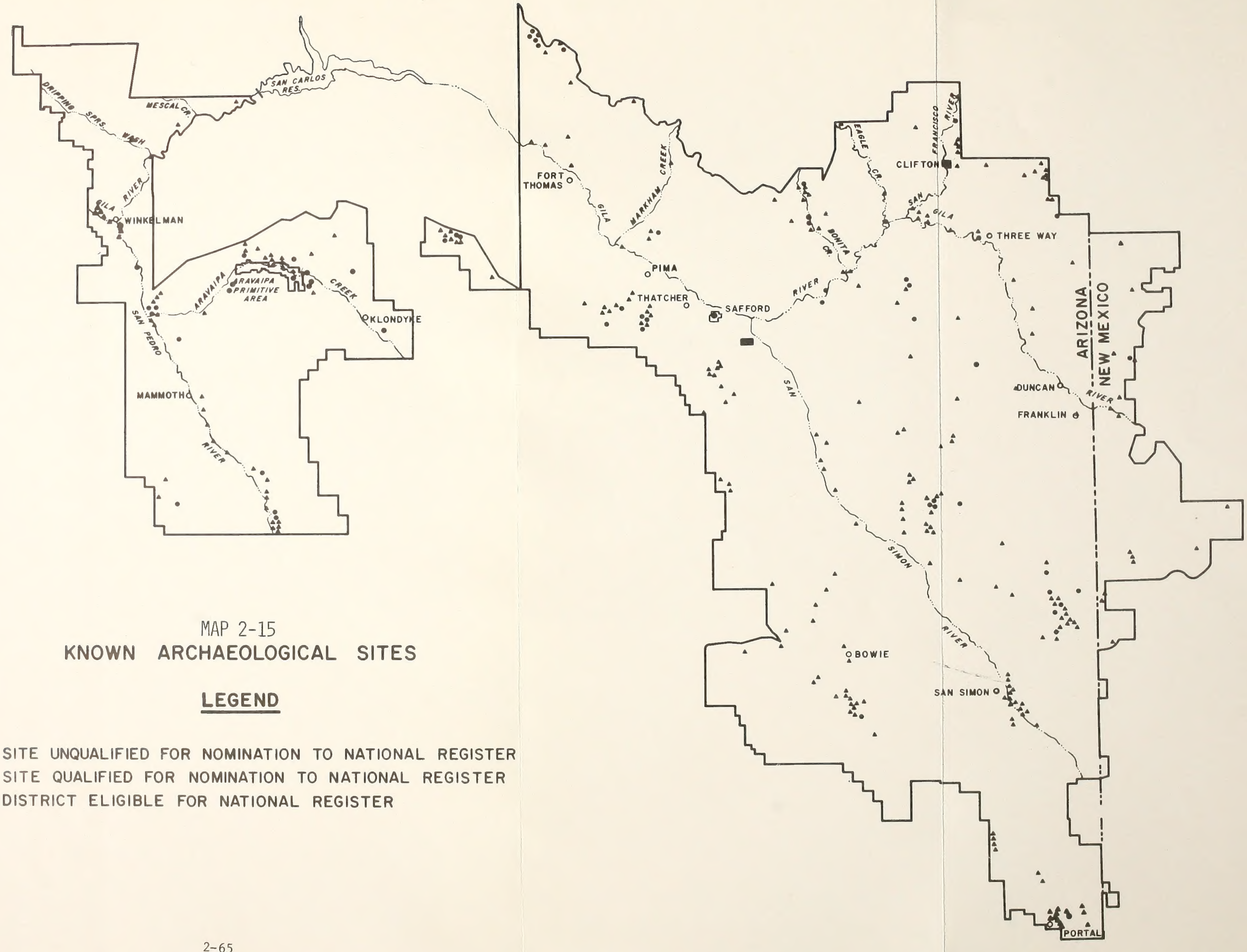
Geological rating determined using BLM Manual 6111, "Quality Evaluation of Recreation Resource Opportunities."

Thirteen types of sites have been identified, the number of known sites of each type is as follows:

1.	Habitation	102
2.	Cave/shelter/overhang/ cliff dwelling	58
3.	Processing	35
4.	Agricultural	6
5.	Petroglyph/pictograph	13
6.	One of the above with agriculture	8
7.	One of the above with petroglyphs/pictographs	16
8.	Sherd scatter	16
9.	Lithic scatter	27
10.	Sherd and lithic scatter	40
11.	Quarry	4
12.	Chipping station	2
13.	Burial	1
14.	Other	6
	Total	334

Distribution and Patterns. The general locations of archaeological sites are shown in map 2-15. The distribution of sites in relation to present grazing allotment boundaries is indicated in appendix G. A total of 279 known archaeological sites occur within grazing units, and 55 occur outside grazing units. Appendix G also includes the ownership status of each site. The following list shows the number of sites in each status. Sites having multiple ownership are combined under two categories.

1.	Public Lands administered by BLM	122
2.	Arizona State Land	75
3.	New Mexico State Land	0
4.	Private Land	110
5.	Public Lands Primitive Area (Aravaipa Canyon Primitive Area)	5
6.	Public Lands and other (mixed ownership)	12
7.	Other mixed ownership	7
8.	Unknown (insufficient data to determine sites' exact location)	3
	Total	334



MAP 2-15

KNOWN ARCHAEOLOGICAL SITES

LEGEND

- ▲ SITE UNQUALIFIED FOR NOMINATION TO NATIONAL REGISTER
- ● SITE QUALIFIED FOR NOMINATION TO NATIONAL REGISTER
- ▬ DISTRICT ELIGIBLE FOR NATIONAL REGISTER

Condition and Impacts. Each site has been assigned one of three relative condition ratings: good, fair, or poor. These ratings are defined in appendix A. Destroyed sites are included under the poor rating. The number of sites in each condition class are as follows:

Good	97
Fair	59
Poor	114
Condition not reported	64
Total	334

The forces impacting the archaeological sites are diverse and numerous. The following table gives the number of impacts reported by type of impact. More than one impact may, and often does, occur at a single site. A total of 381 separate impacts have been reported for the 270 sites on which condition data have been collected. Only those impacts positively identified are included here; suspected impacts are excluded. Site-specific impacts and condition are included in appendix G.

1.	Vandalism (digging)	75
2.	Vandalism (surface collecting)	9
3.	Vandalism to petroglyphs/pictographs	8
4.	Visitor use (camping, etc.)	6
5.	Historical occupation	4
6.	Historical agriculture	6
7.	Cattle trampling	29
8.	Road or other improvement	98
9.	Erosion	88
10.	Weathering of petroglyphs/pictographs	15
11.	Deposition	24
12.	Animal nest or manure cap	9
13.	Excavation	12
	Total	381

National Register of Historic Places. At present no archaeological sites in the ES area are listed on the National Register of Historic Places. The Foote Wash--No-Name Wash Archaeological District, has been determined eligible for inclusion and has been nominated by the Soil Conservation Service. The district includes 13 sites (BLM sites 320-332), containing 21 geographically separate loci. The district is located in the Foote Wash--No-Name Wash Flood Detention Project area southeast of Safford, and many of the sites have been destroyed by construction. Archaeological mitigation studies outlined by the National Park Service were conducted before construction. The sites are described in appendix G under grazing units 46, 100, and 101.

The Safford District has determined that 77 additional sites are qualified for nomination to the register, and that 244 sites are unqualified. (See appendix G for the site-specific determination.) The State Historic Preservation Officer will be requested to comment on the determination when reviewing the draft ES.

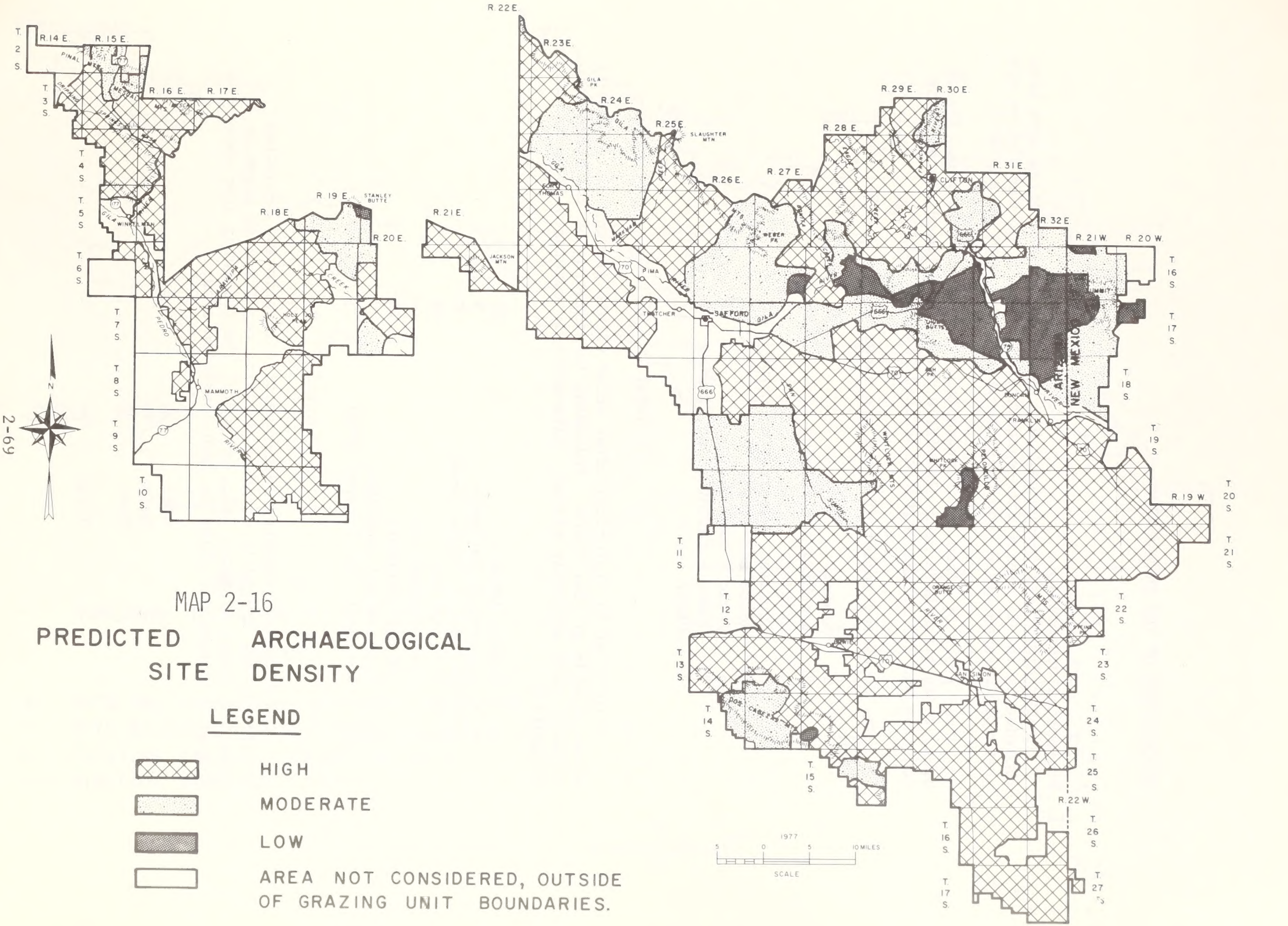
National Register qualification was determined using the criteria of eligibility as stated in 36 CFR Part 800 - Advisory Council on Historic Preservation Procedures and repeated in 36 CFR Part 60 and Part 63 - Department of the Interior: National Park Service; National Register of Historic Places.

The projected number of unknown sites qualified for the National Register in the ES area is 1,900. Approximately 20 percent of the known archaeological sites are believed to be qualified. On the basis of the projected total number of sites in the ES area, the final percentage should remain near this figure.

Other Archaeological Resources. Sites being classified as "other" consist of two categories: (1) known sites that have not been recorded and (2) sites unknown to BLM. A total of 180 archaeological sites have been reported to BLM in the past year but have not been field checked or recorded by BLM. In addition, the locations of approximately 50 sites have been determined from early archaeological reports that lacked site descriptions. BLM archaeologists have checked and recorded a few of these sites, which are included in the present inventory. The remaining 230 sites will be field checked and recorded as manpower permits. At present the knowledge of their existence and reported locations is a great aid in projecting areas containing sites and in predicting site density. These sites have successfully filled any large geographic gaps in our archaeological inventory.

The predicted number of unknown sites in the ES area is roughly 9,500. This estimate is based on the number of known sites, the predicted density of sites, the percentage of the ES area surveyed to date, and a consideration of the pattern of previous surveys. Early surveys were generally confined to high-potential areas. As a result, the predicted number and density of sites are lower than they would have been otherwise.

Predicted archaeological site density is shown in map 2-16 on a relative scale of high, moderate, and low. Areas outside grazing units are excluded, since they will not be directly impacted by the proposed action. As map 2-16 shows, much of the ES area is predicted to have a high potential for the presence of abundant archaeological sites. The high predicted number of sites reflects this projected density.



MAP 2-16

PREDICTED ARCHAEOLOGICAL SITE DENSITY

Historical Resources

Known Historical Resources. Ninety-six historical sites have been recorded in the ES area. Site-specific descriptions of these sites are presented in appendix H, and their locations are shown in map 2-17.

Many types of sites are represented. Scattered throughout the ES area, these sites have been classified into types, based (1) on their function and (2) on the party associated with the site.

The types and number of sites are shown below:

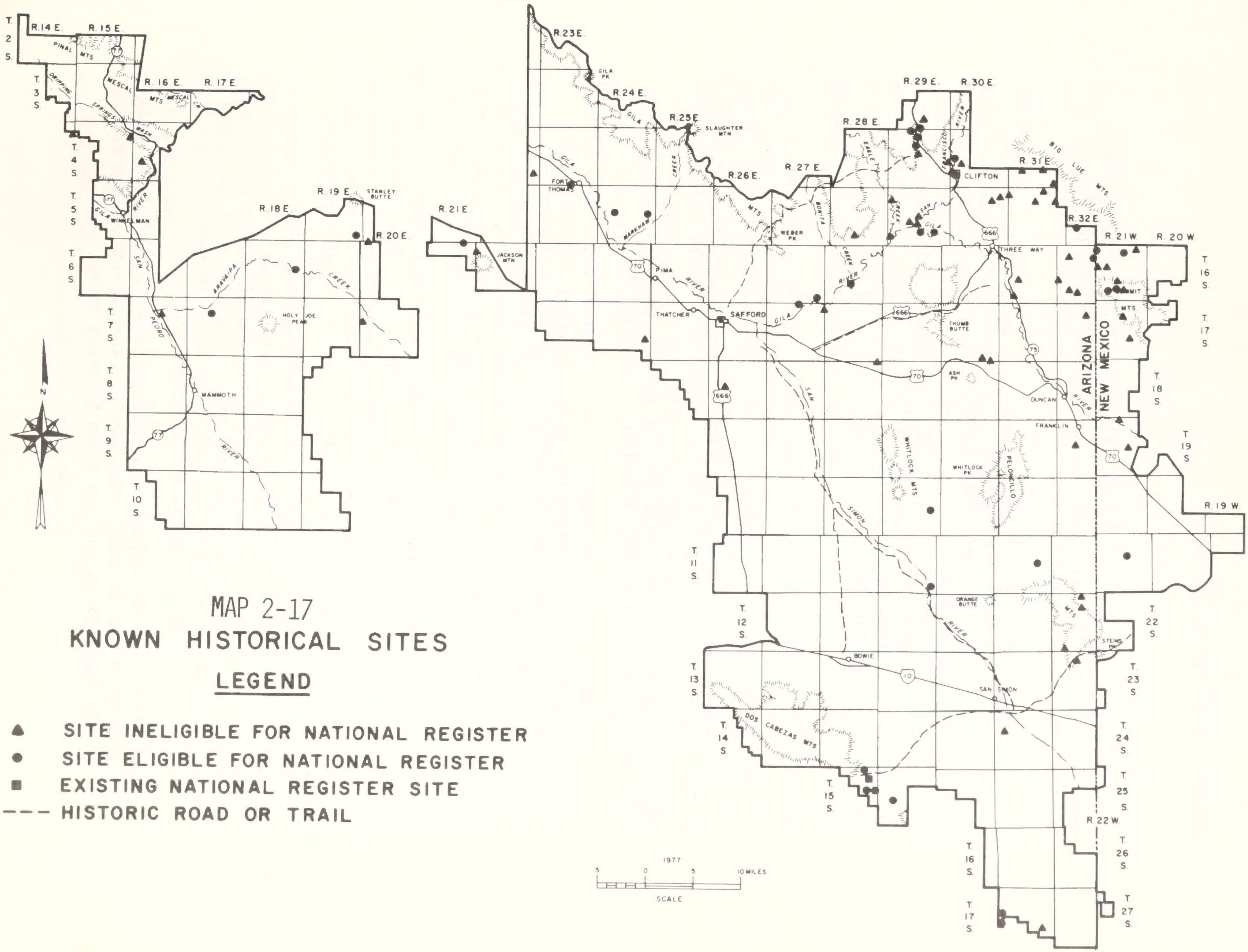
1.	Mining	24
2.	Ranching and farming	25
3.	Military	9
4.	Civilian Conservation Corps	6
5.	Roads and trails	5
6	Towns - mining	7
7.	Towns - ranching and farming	3
8.	Other	17
	Total	96

A total of 83 historical sites occur within grazing units, and 13 occur outside grazing units. Following is a listing of the number of sites in each ownership status. Site-specific ownership is indicated in appendix H.

Public lands	26
Arizona State lands	9
New Mexico State lands	0
Private land	48
Public lands and mixed ownership	12
Other mixed ownership	0
National Park Service (NPS)	1
Total	96

Condition and Impacts. Site-specific impacts and resulting conditions are listed in appendix H. Site condition is given as a relative rating of good, fair, or poor. The following list shows the number of historical sites in each condition class.

Good	31
Fair	26
Poor	39
Total	96



MAP 2-17
KNOWN HISTORICAL SITES

LEGEND

- ▲ SITE INELIGIBLE FOR NATIONAL REGISTER
- ● SITE ELIGIBLE FOR NATIONAL REGISTER
- ■ EXISTING NATIONAL REGISTER SITE
- ---- HISTORIC ROAD OR TRAIL

Impacts to the historical resources are tabulated below. Each occurrence, excluding vandalism, is counted. An individual site may have had more than a single impact.

1.	Vandalism (digging)	6
2.	Vandalism (collecting)	35
3.	Road or other "improvement"	19
4.	Weathering	39
5.	Collapsing (partially or complete, common caused by weathering.)	42
6.	Trampling	6
7.	Recent use	19
8.	Erosion	12
9.	Deposition	6
10.	Other	6
	Total	190

National Register of Historic Places. The ES area has two sites listed on the National Register (site 4--Kearny Campsite and Trail and site 15--Fort Bowie National Historic Site, which was included on the National Register automatically when it was designated a national historic site. These sites are described in appendix H.

A minimum of 37 of the remaining 94 historical sites have been determined qualified for nomination to the National Register. The criteria and methods used in the determination are explained in the National Register discussion in the archaeological resources section of this chapter. As with the archaeological determinations, the historical designations may change as a result of the reviews of the State Historic Preservation Officer or during the nomination process.

An estimated 25 percent or 250 unknown historical sites are expected to qualify for nomination to the National Register. These sites are believed to be diverse and widespread and to include mining, homestead, and transportation types. Abundant unknown qualified sites associated with mining are believed to be present in the Dos Cabezas Mountains.

Other Historical Resources. Other historical resources consist of two categories of sites: (1) known sites that have not been recorded or visited by BLM; and (2) unknown sites. The first category includes 60 sites reported to BLM within the past year. The only data available on most of these sites is their location. The sites represent a wide range of types distributed throughout the ES area.

An estimated 1,000 unknown diverse historical sites are believed to exist throughout the ES area. The heaviest concentrations are believed to occur in the Black Hills and San Simon Planning Units.

Predicted density of historical sites is shown in map 2-18. The relative density classes of high, moderate, and low are indicated by grazing unit.

Aesthetics

The visual resource is defined as the land, water, vegetation, animals, and other visible features of an area. To evaluate and quantify the visual resources of the ES area, visual management units with visual resource management (VRM) classes were developed using procedures in BLM Manual 6300, Visual Resource Management. Visual management units are contiguous areas of similar visual quality. A VRM class contains specific objectives for maintaining or enhancing the visual resource values. Each class describes a different degree of change modification allowed in the basic elements of the landscape.

Visual management units and Visual Resource Management (VRM) classes are based on three factors: (1) the scenic quality rating, (2) a sensitivity evaluation, and (3) a visual zone map (the location of each viewing area from a use area such as road, river, or observation point). Map 2-19 shows management units and appropriate VRM classes.

The scenic quality rating system evaluates scenic areas and compares them with the physiographic region. The rating results place the area in one of three categories, A, B, or C, which are illustrated in figures 2-9 through 2-11.

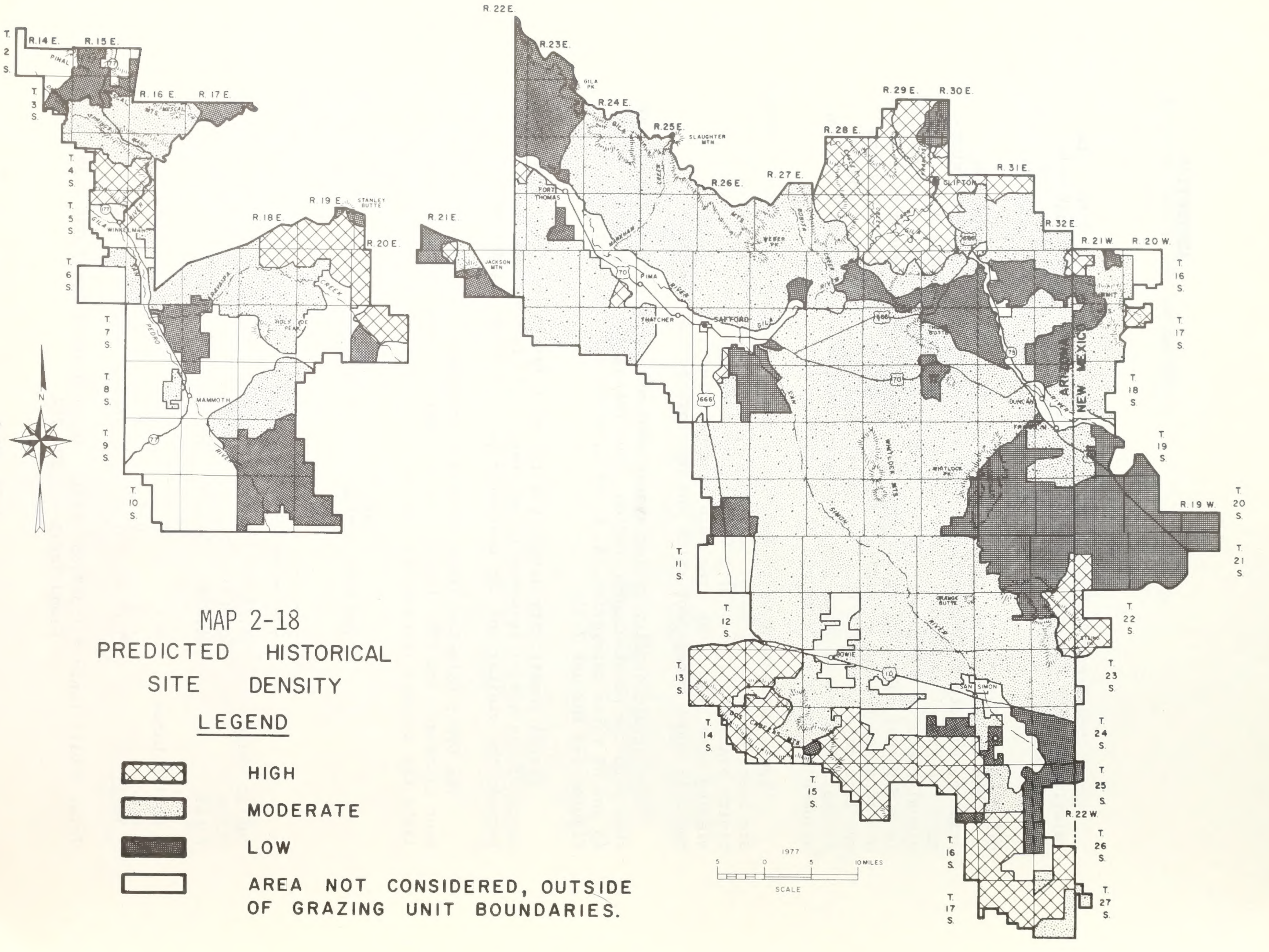
Visual sensitivity levels provide an index to the relative importance of the visual response to an area. They indicate the relationship between the visitor and the aesthetic quality of the landscape.

The Upper Gila-San Simon ES area encompasses all of the five management classes. The VRM classes are delineated on map 2-19. Table 2-13 lists the acreage in each VRM class.

TABLE 2-13
VRM UNIT ACREAGE BY OWNERSHIP

	I	II	III	IV	V
Public Lands	130,916	9,516	523,017	685,403	829
Other	50,802	25,034	381,668	976,007	21,520
Total	181,718	34,550	904,685	1,661,410	22,349
% Public Lands	4.7	0.3	18.6	24.4	---
% Other	2.3	0.7	13.4	34.6	1.0
% Total	7.0	1.0	32.0	59.0	1.0

Total Public Lands = 1,349,681 (48%) Total Other = 1,455,031 (52%)
Grand Total = 2,804,712



MAP 2-18

PREDICTED HISTORICAL SITE DENSITY

LEGEND

HIGH

MODERATE

LOW

AREA NOT CONSIDERED, OUTSIDE OF GRAZING UNIT BOUNDARIES.

Figure 2-9 Class "A" (excellent) scenery, Aravaipa Canyon Primitive Area

Figure 2-10 Class "B" (above average) scenery, Doubtful Canyon

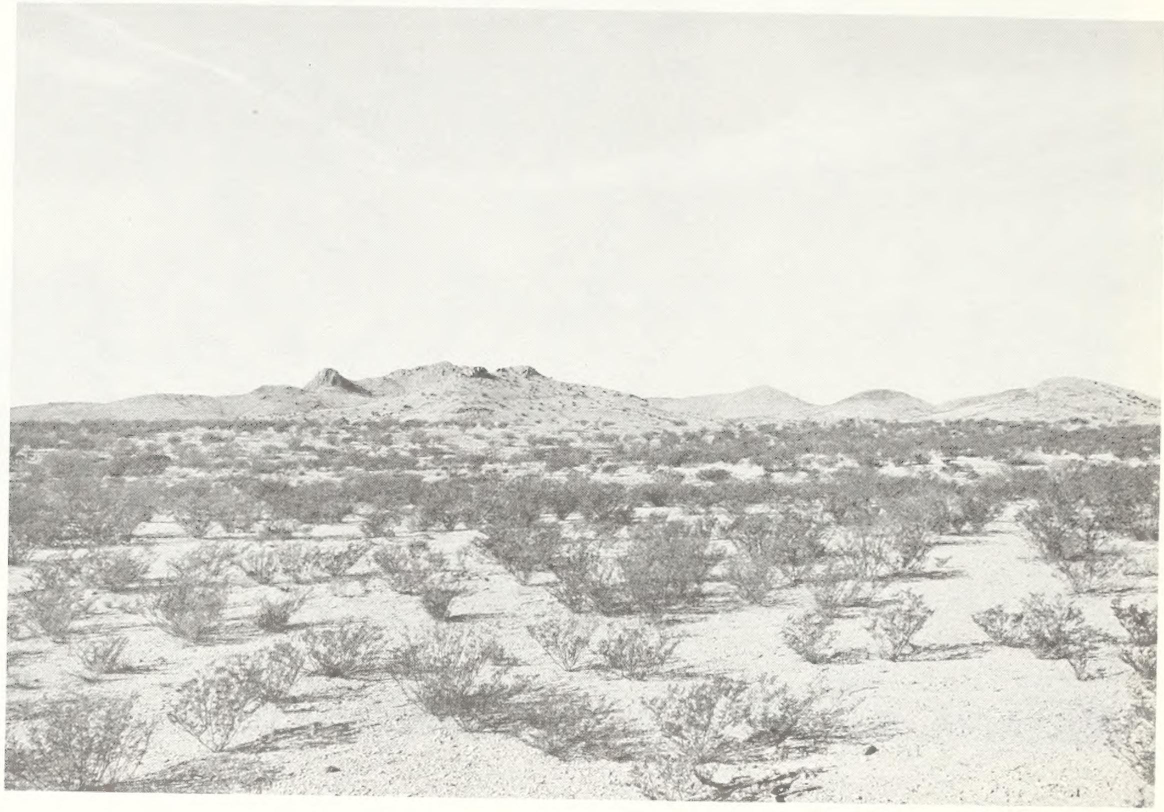


Figure 2-11 Class "C" (normal) scenery, Black Hills

The natural landscape of the ES area has been subjected to numerous modifications. These intrusions include features built to serve settlements (roads, powerlines, water diversions, and pipelines) as well as features directly involving livestock grazing and mining. Intrusions can have a positive or negative aesthetic impact, and are part of the criteria considered in developing the various management classes.

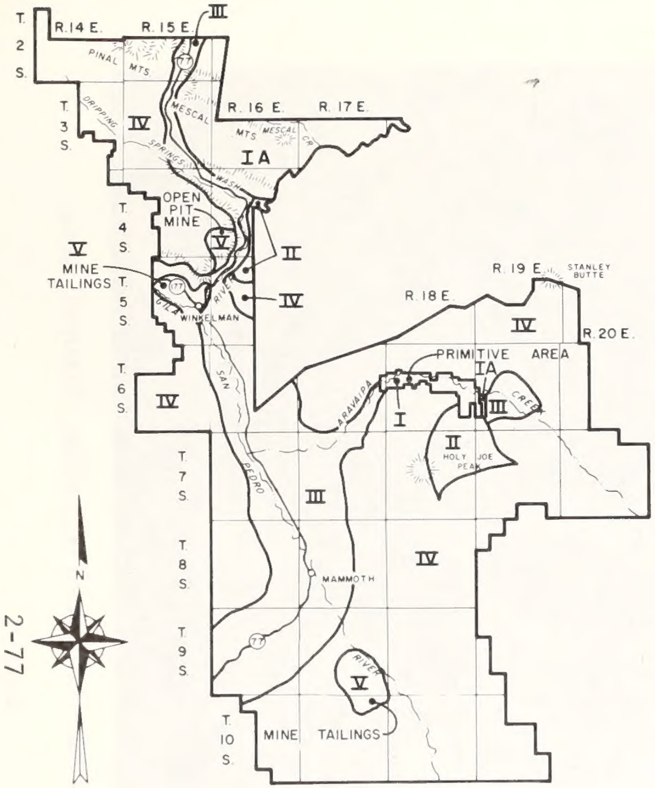
Primitive Values

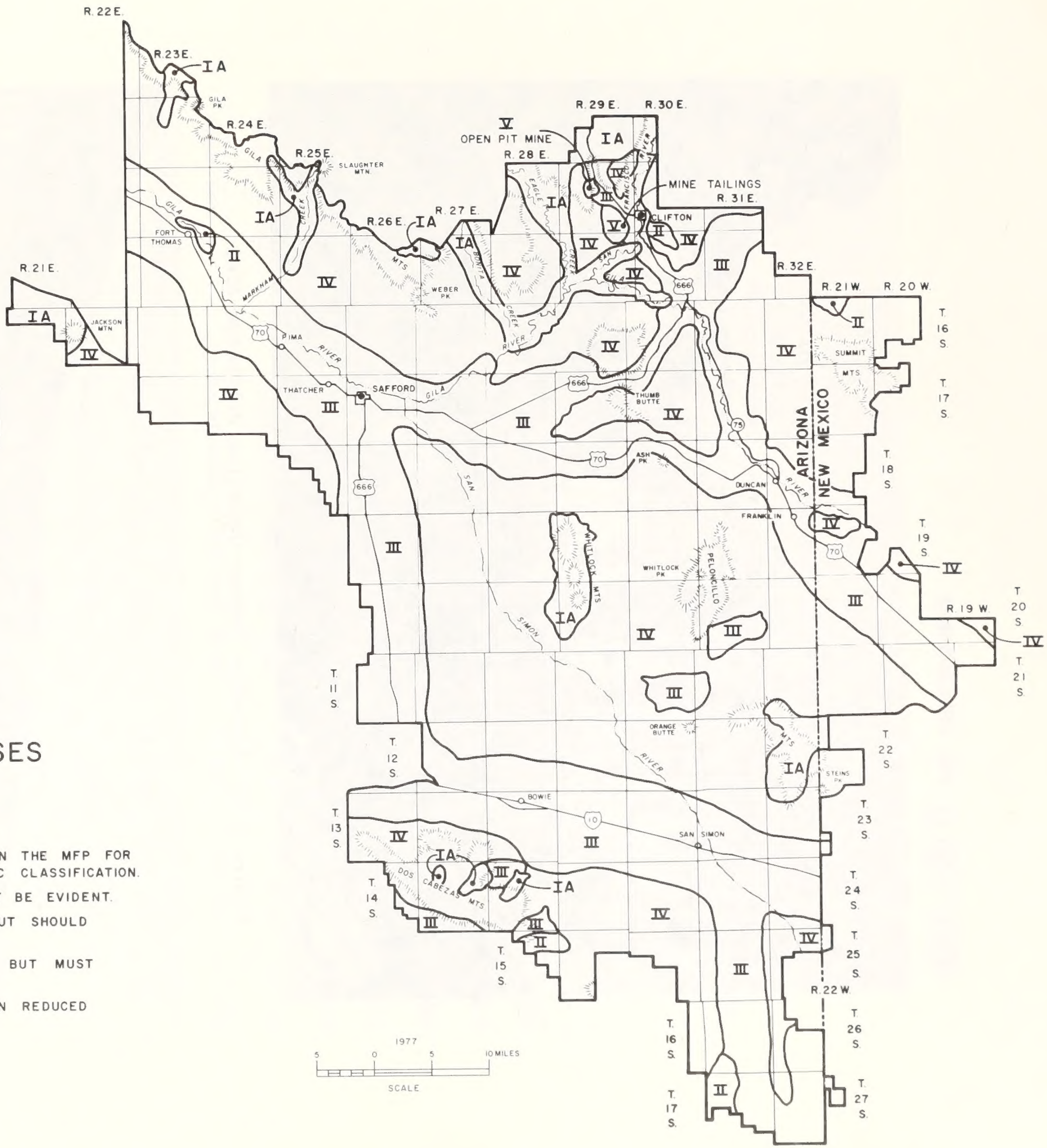
Primitive Areas

Aravaipa Canyon Primitive Area is the ES area's only designated primitive area (figure 2-12). Livestock grazing on a regular basis was discontinued there in August 1974, but occasionally a few cattle stray into the primitive area.

Natural Areas

Natural areas are lands managed for retention of their typical or unusual plant or animal types, associations, or other biotic phenomena; or their outstanding scenic, geologic, pedologic, or aquatic features or processes. MFPs have identified 10 potential areas to be managed as natural areas or retained in a natural condition for further study of their potential (figure 2-13) (table 2-14). In addition, the San Simon Valley Natural Area, proposed by the State of Arizona, falls within a BLM grazing unit. Proposed natural areas are shown on map 2-20.





MAP 2-19
VISUAL RESOURCE MANAGEMENT UNIT CLASSES

LEGEND

I — PROVIDES PRIMARILY FOR NATURAL ECOLOGICAL CHANGES.

IA — SPECIAL MANAGEMENT AREAS THAT WERE DESIGNATED IN THE MFP FOR STUDY TO DETERMINE THEIR POTENTIAL FOR A SPECIFIC CLASSIFICATION.

II — CHANGES IN ANY OF THE BASIC ELEMENTS SHOULD NOT BE EVIDENT.

III — CHANGES IN THE BASIC ELEMENTS MAY BE EVIDENT, BUT SHOULD REMAIN SUBORDINATE.

IV — CHANGES MAY SUBORDINATE THE ORIGINAL COMPOSITION, BUT MUST REFLECT A NATURAL OCCURRENCE.

V — CHANGE IS NEEDED. THE QUALITY CLASS HAS BEEN REDUCED BECAUSE OF UNACCEPTABLE INTRUSIONS.

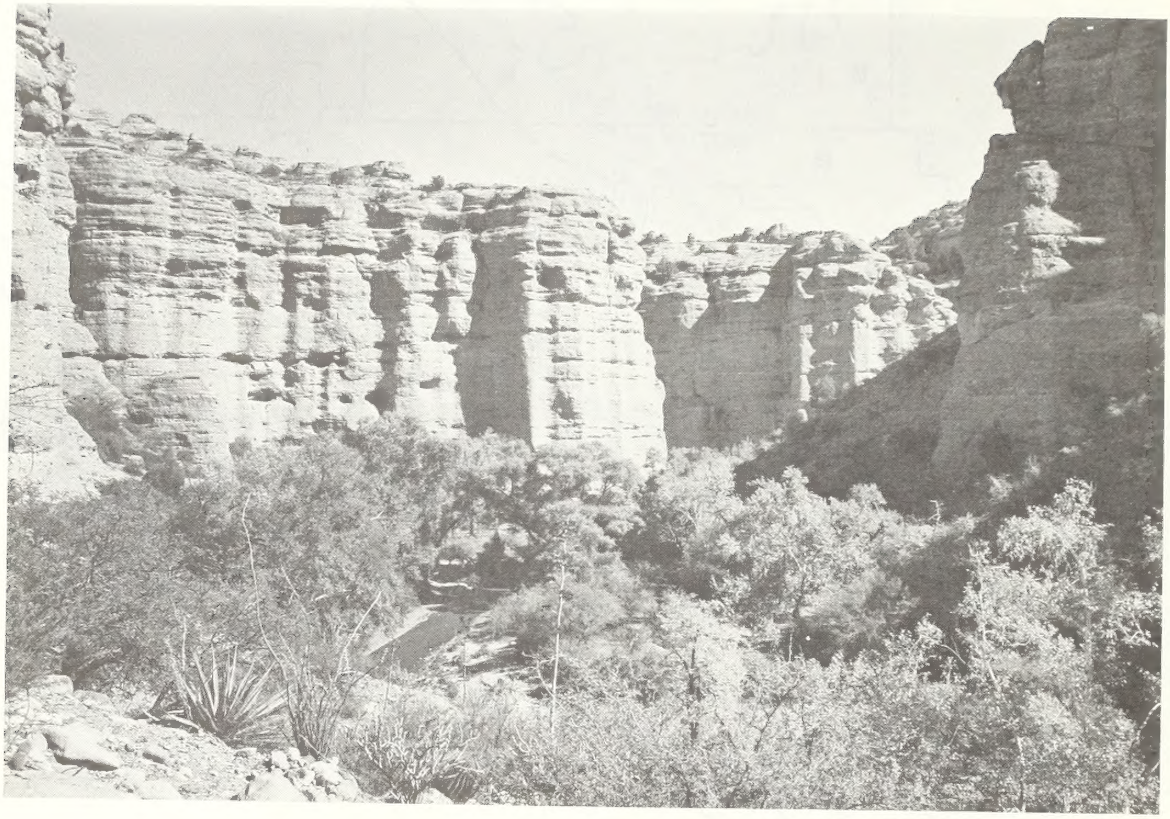


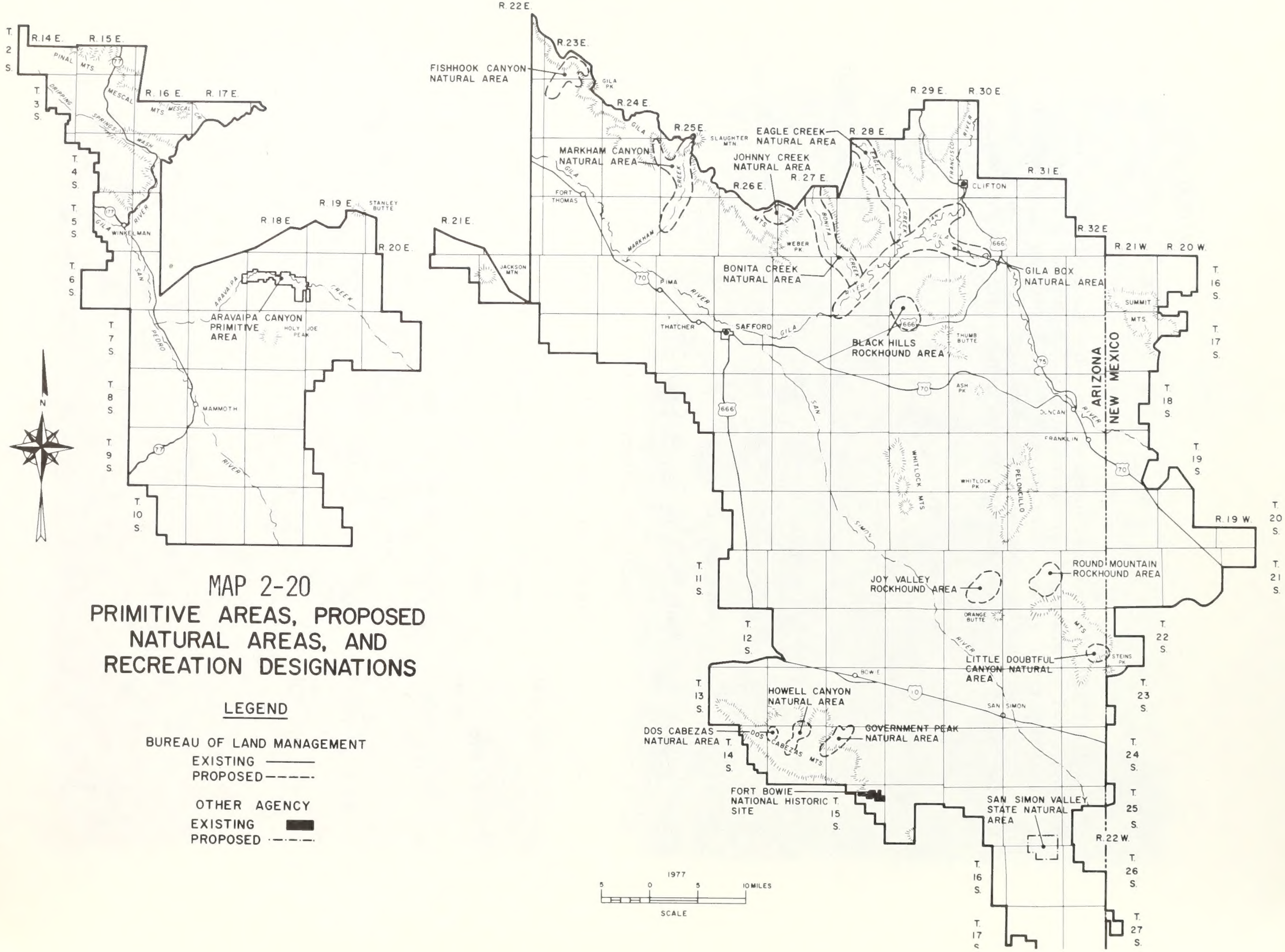
Figure 2-12 Aravaipa Canyon--Existing Primitive Area

Figure 2-13 Bonita Creek--Proposed Riparian Natural Area

All of BLM's 10 proposed natural areas are being grazed. The present level of grazing is deteriorating their natural condition as evidenced by their present poor to good range condition (appendix B). The six proposed outstanding natural areas are noted for their riparian habitat, which is deteriorating and even disappearing in some areas.

TABLE 2-14
PROPOSED NATURAL AREAS

NAME	TYPE OF DESIGNATION	ACREAGE BLM	ACREAGE OTHER	ACREAGE TOTAL
Fishhook Canyon	Outstanding Natural Area	3,800	---	3,800
Markham Canyon	Outstanding Natural Area	3,040	5,760	8,800
Johnny Creek	Outstanding Natural Area	1,840	---	1,840
Bonita Creek	Outstanding Natural Area	8,760	2,920	11,680
Eagle Creek	Outstanding Natural Area	5,520	10,640	16,160
Gila Box	Outstanding Natural Area	8,040	10,680	18,720
Little Doubtful Canyon	Research Natural Area	1,200	40	1,240
Dos Cabezas	Research Natural Area	400	---	400
Howell Canyon	Research Natural Area	1,640	---	1,640
Government Peak	Research Natural Area	1,480	120	1,600
San Simon Valley	State Natural Area	160	3,520	3,680
	TOTAL	35,880	33,680	69,500



MAP 2-20
PRIMITIVE AREAS, PROPOSED NATURAL AREAS, AND RECREATION DESIGNATIONS

Table 2-15 shows existing range improvements on the proposed natural areas.

TABLE 2-15
RANGE IMPROVEMENTS ON PROPOSED NATURAL AREAS

NAME	EXISTING DEVELOPMENTS Fence (Miles)	Pipe- (Miles)	Water Troughs	Corrals	Developed Springs	Wells	Reser- voirs	Storage Tanks
Fishhook Canyon	1	---	2	1	1	1	4	---
Markham Canyon	3	---	3	4	3	---	---	---
Johnny Creek	0.5	---	2	1	1	1	---	---
Bonita Creek	6	6.5	6	2	---	1	1	---
Eagle Creek	4.0	1.5	4	2	---	---	2	---
Gila River	17	3	1	2	---	1	6	1
Little Doubtful Canyon	4	---	---	---	---	---	1	---
Dos Cabezas	2	---	---	---	---	---	---	---
Howell Canyon	1	---	---	---	---	---	---	---
Government Peak	3	---	---	---	---	---	---	---
San Simon Valley (State)	3.0	---	---	---	---	1	4	---

Wilderness Values

The Federal Land Policy and Management Act of 1976, section 603(a) requires a review of identified potential wilderness areas having characteristics described in the Wilderness Act of 1964. Eight roadless study areas within the ES area appear to have some wilderness potential (map 2-21). Existing range improvements in these areas are shown in table 2-16, and grazing units with proposed or existing improvements in roadless areas are as follows:

Roadless Area	Grazing Units
Gila Box	1, 3, 7, 166, 167, 186
Gila River	114, 117, 118, 119, 120, 121
Aravaipa Canyon	136
Turtle Mountain	3, 165, 166, 167, 168
Jackson Mountain	179, 180, 181, 182, 183
Fishhook Canyon	151
Whitlock Mountain	48, 55
Doubtful Canyon	43, 44, 45, 60, 69

These areas were identified on the basis of their (1) being roadless and (2) being contiguous areas of public lands of 5,000 acres or more.

These areas were identified, however, prior to the BLM definition of a road, which is "An access route which has been improved and maintained using hand or power machinery or tools to insure relatively regular and continuous use. A way maintained solely by the passage of vehicles does not constitute a road." Applying this definition to the ES area might yield fewer or more roadless areas than the eight originally inventoried.

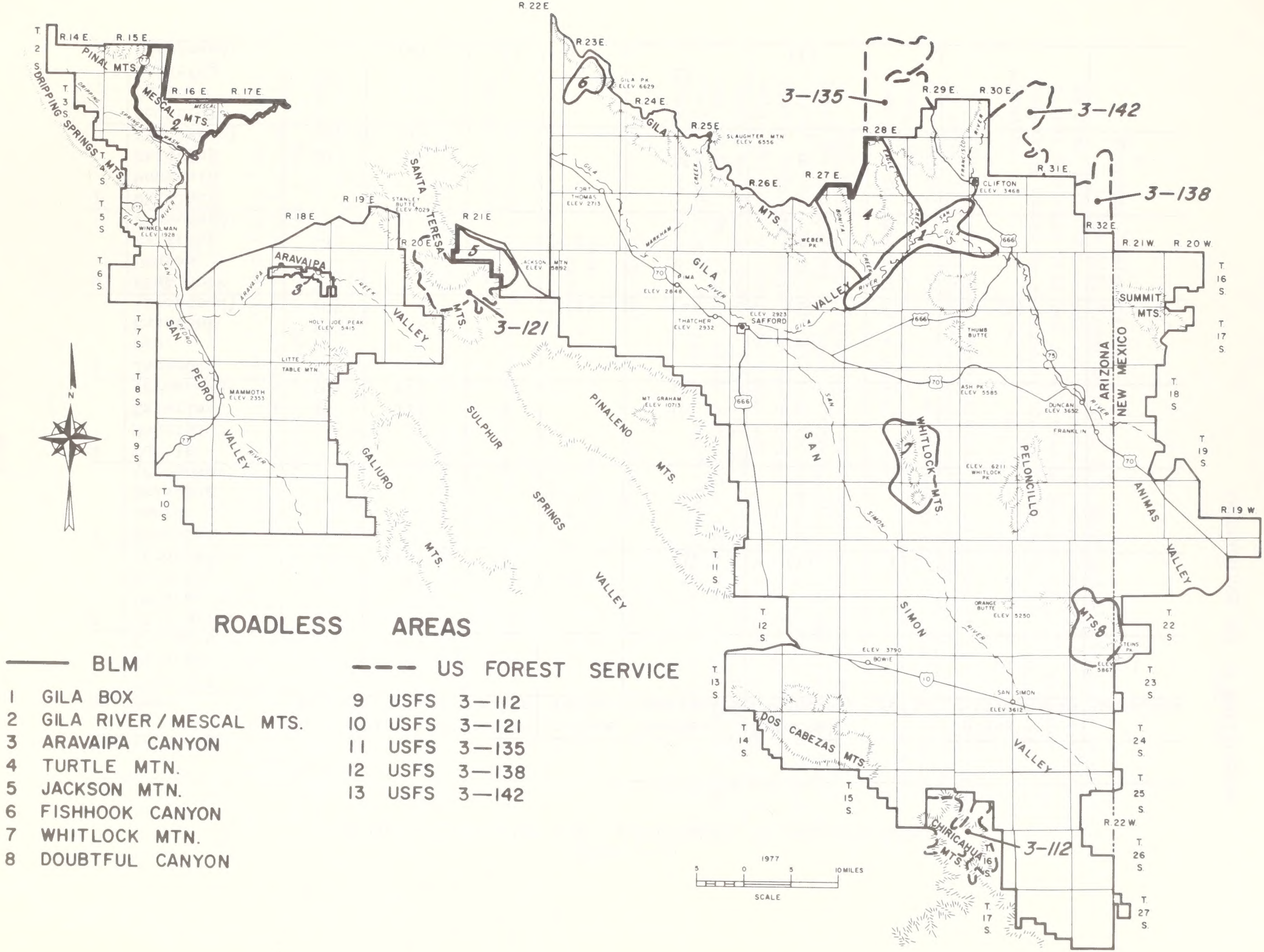
These eight areas have not been evaluated for the wilderness characteristics contained in section 2 of the Wilderness Act.

Land Use

Recreation

Designations. The following portions of the ES area within grazing units have been formally designated or proposed for designation or withdrawal for the management of their recreation resources.

Existing Designated Areas--Fort Bowie National Historic Site. The National Park Service has administered Fort Bowie National Historic Site since the site was authorized by Congress on August 30, 1964. The site was formally established on July 28, 1972. Public lands within view of the site have been withdrawn from all forms of appropriation under the mineral leasing laws. The withdrawal was needed to protect the scenic and historic values. Grazing is permitted on public lands and is administered by BLM. Portions of the historic site are not grazed.



ROADLESS AREAS

—— BLM

1 GILA BOX
2 GILA RIVER / MESCAL MTS.
3 ARAVAIPA CANYON
4 TURTLE MTN.
5 JACKSON MTN.
6 FISHHOOK CANYON
7 WHITLOCK MTN.
8 DOUBTFUL CANYON

– – – US FOREST SERVICE

9 USFS 3—112
10 USFS 3—121
11 USFS 3—135
12 USFS 3—138
13 USFS 3—142

TABLE 2-16
PROPOSED AND EXISTING RANGE IMPROVEMENTS IN ROADLESS AREAS

Roadless Area No.	Name	Fence (Miles)	Pipelines (Miles)	Wind-mills	Storage Tanks	Earthen Reservoirs	Rainfall Catchments	Wells	Spring Developments	Guzzlers
1	Gila Box									
	Existing	24	3						1	1
	(Proposed)	(29)	(4)							
2	Gila River (Mescal Mtns.)									
	Existing	32	4		1	6	6		3	
	(Proposed)	(4)	(2)			(3)	(1)	(2)		
3	Aravaipa Canyon									
	Existing	2				1	1			
	(Proposed)									
4	Turtle Mountains									
	Existing	38	12	1		14			7	
	(Proposed)	(6)	(2)			(1)				
5	Jackson Mtn.									
	Existing	15	5	1	3	2			1	
	(Proposed)	(6)			(1)	(4)	(1)		(1)	
6	Fish Hook Canyon									
	Existing	8			1		1			
	(Proposed)									
7	Whitlock Mountain									
	Existing	20				16	8			1
	(Proposed)	(5)	(1)							
8	Doubtful Canyon									
	Existing	25		1	1	13			3	
	(Proposed)		(4)	(1)			(1)			

Proposed Designations.

Lower Gila River and Gila Box Wild and Scenic River Study Areas. In June 1973, BLM submitted requests to have these river segments added to the National Wild and Scenic Rivers Systems 5d list, whereby their potential would be evaluated. Determination of the requests are still pending.

The Gila Box study area consists of 20 miles of river, approximately 13 miles (from the San Francisco River to Bonita Creek) of which have been recommended as a wild or scenic segment. The remaining 7 miles have been recommended as a scenic river. The entire lower Gila River has been recommended as a scenic river.

Off-Road Vehicle Proposals. MFPs have recommended that Public lands be designated as "open", "regulated", or "closed" (map 2-22). On "open" areas and trails ORVs can be operated. On "regulated" areas and trails ORVs are subject to restrictions such as types and numbers of vehicles, time of use, and areas and trails used. The regulated areas identified in the Safford District MFPs restrict ORVs to existing roads and trails. On "closed" areas and trails ORVs are permanently or temporarily prohibited. Acreages for each ORV proposed designation in the ES area are as follows:

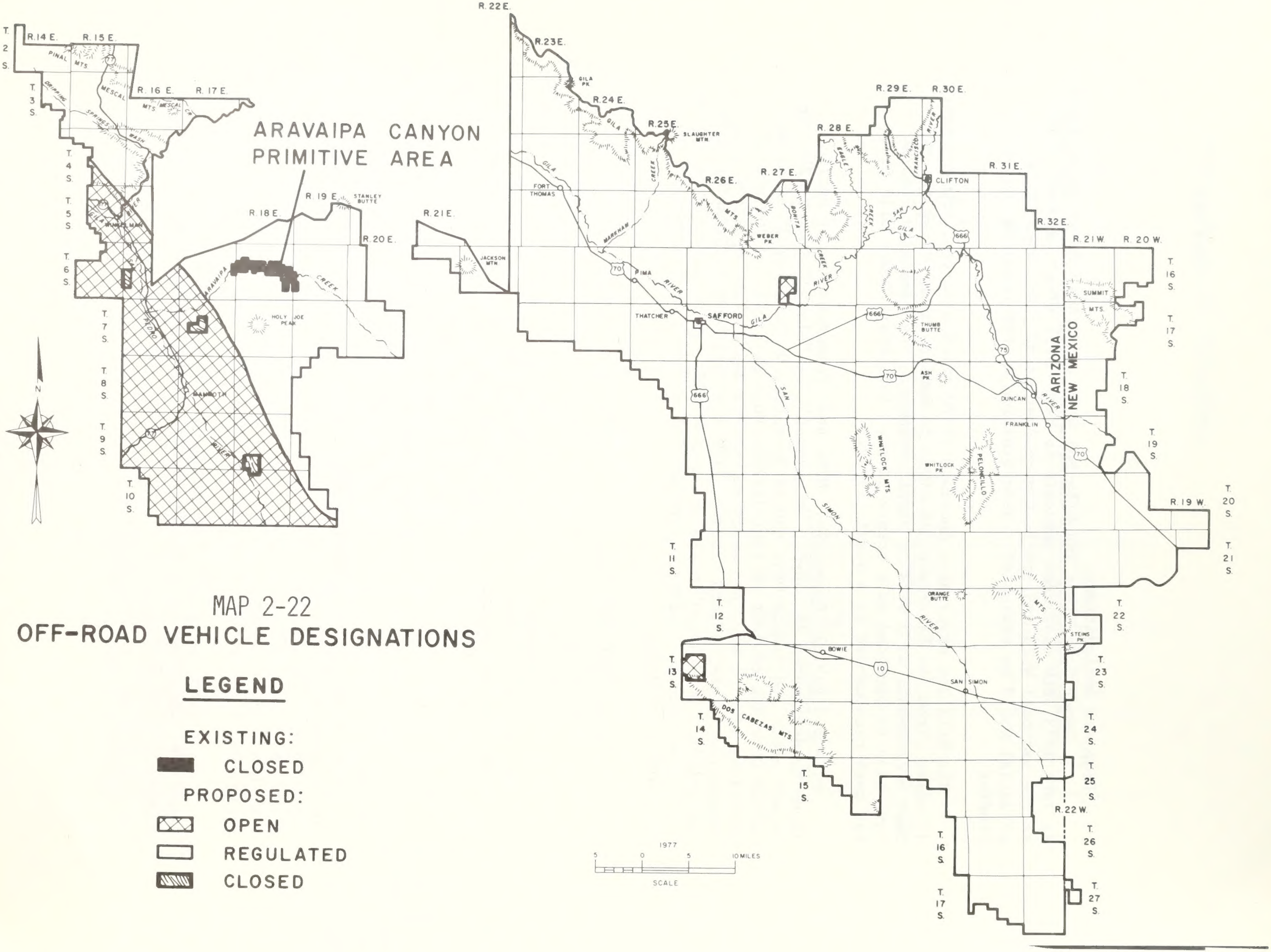
Proposed	Acreage
Open	44,840
Closed	5,084
Regulated	1,295,815

Aravaipa Canyon Primitive Area been closed to ORV use as directed by Executive Order 11644.

Facilities. Few recreation sites have been developed on public lands within the ES area, and those established have had minimal facilities (map 2-23).

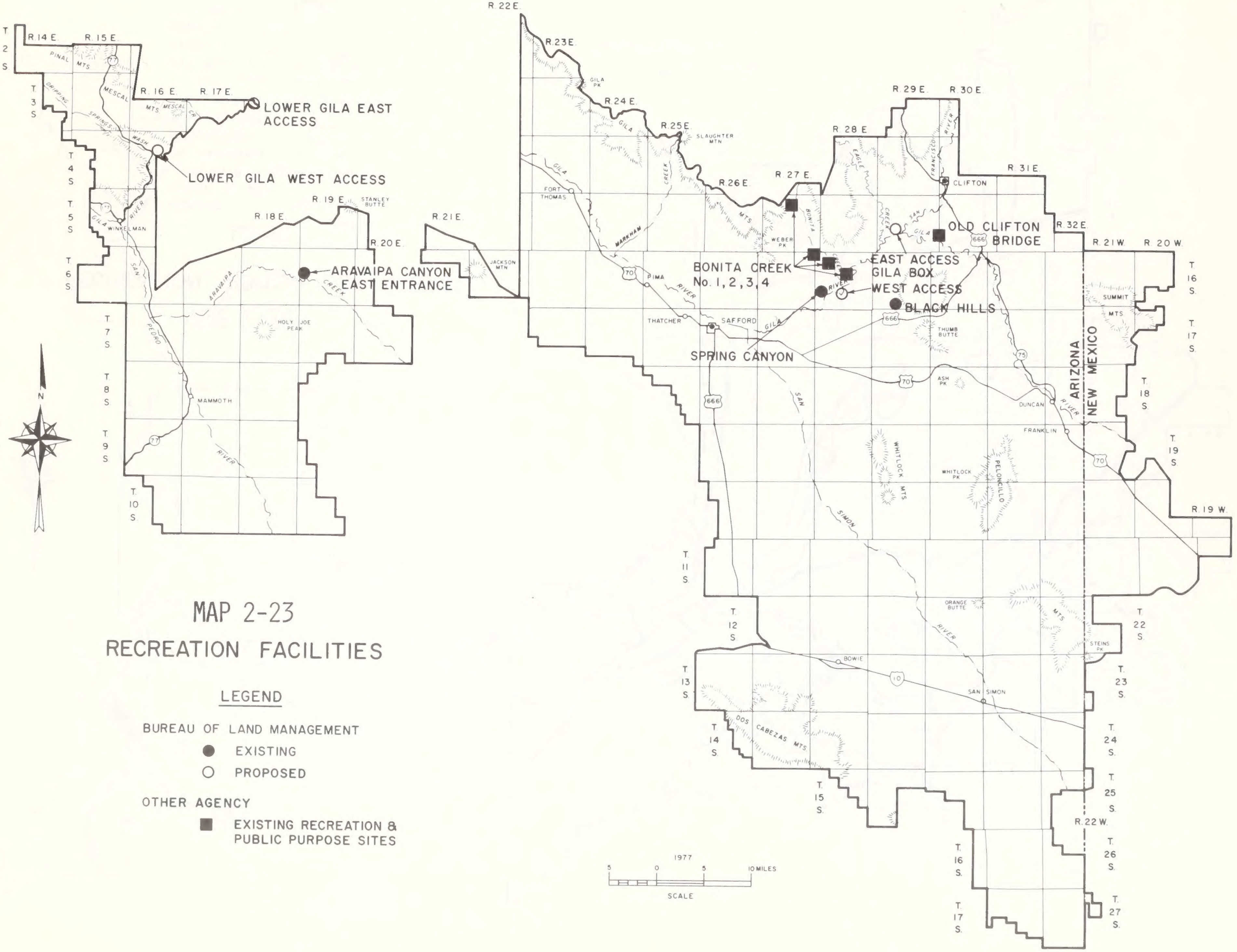
Recreation Uses, Use Areas, and Amounts. Recreation resources in the ES area were identified through extensive inventories using BLM Manual 6111, "Quality Evaluation of Recreation Use Opportunities" (maps 2-24, and 2-25). The kinds of recreation resources found are varied as are their values, which are rated on a relative scale of Class A--excellent, Class B--good, and Class C--fair (table 2-17).

Recreation use in the ES area has been low and confined to a few locations, with the exception of hunting, which is widespread (maps 2-26 and 2-27).



MAP 2-22

OFF-ROAD VEHICLE DESIGNATIONS



MAP 2-23

RECREATION FACILITIES

LEGEND

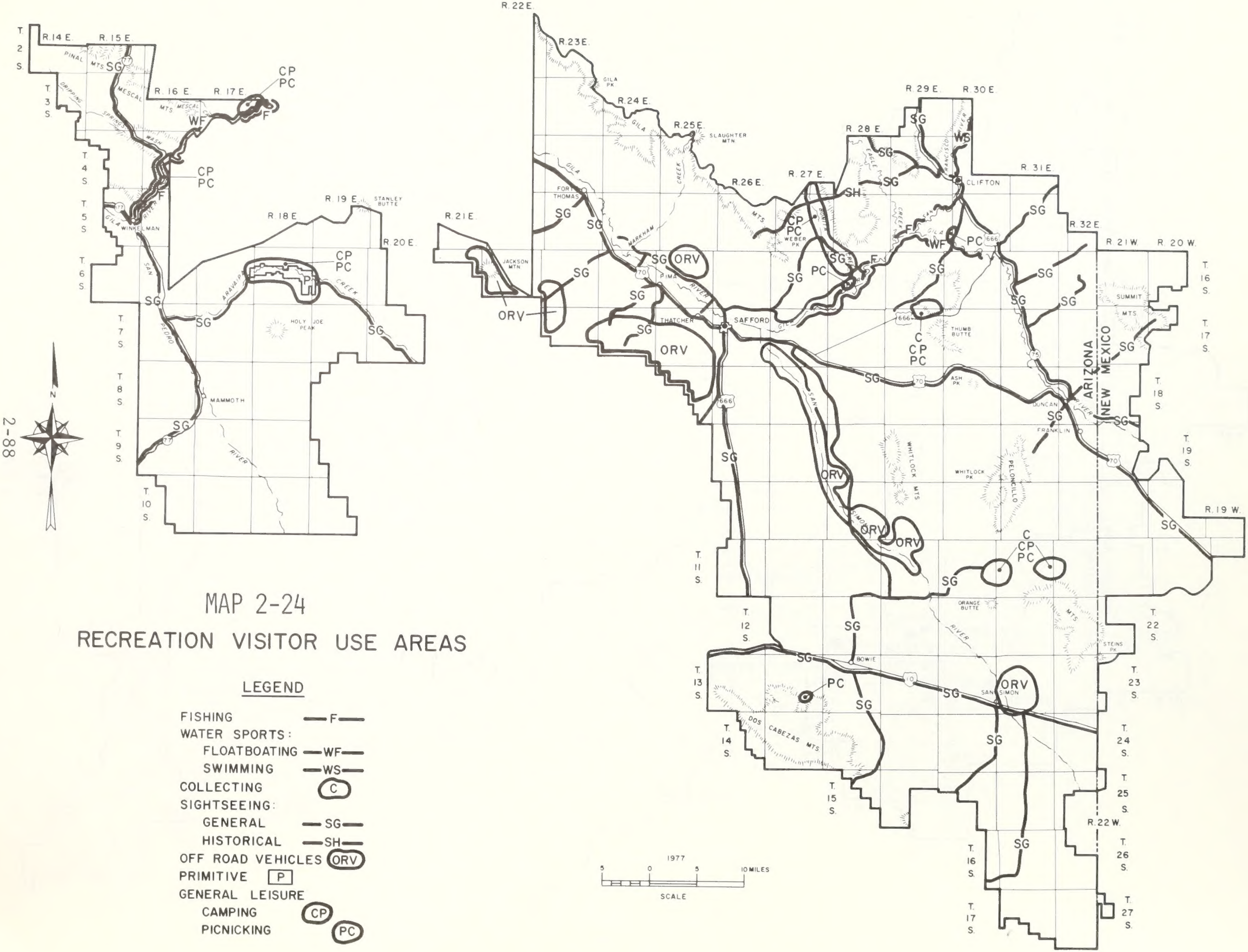
BUREAU OF LAND MANAGEMENT

● EXISTING

○ PROPOSED

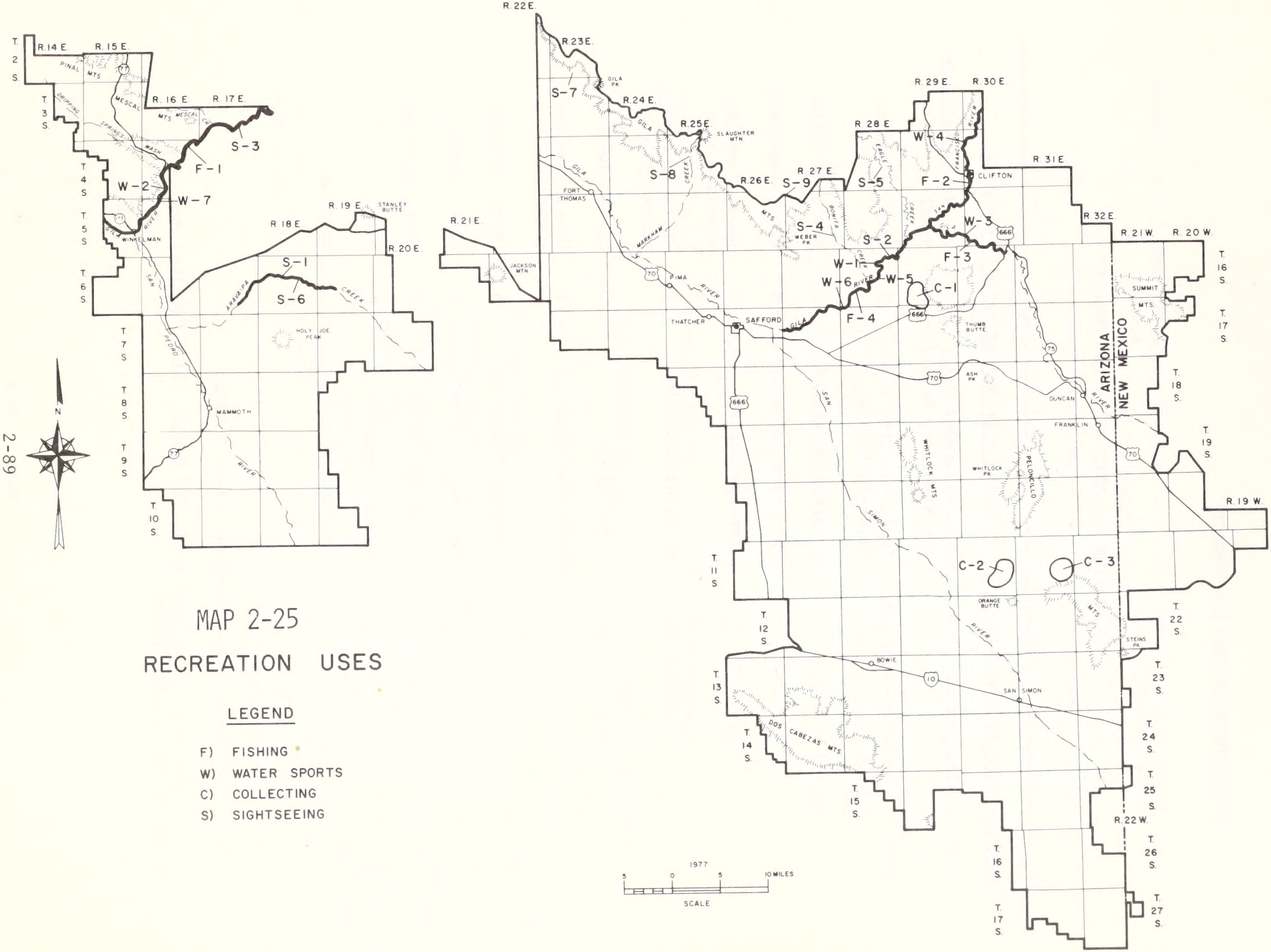
OTHER AGENCY

■ EXISTING RECREATION & PUBLIC PURPOSE SITES



MAP 2-24

RECREATION VISITOR USE AREAS



MAP 2-25

RECREATION USES

LEGEND

F) FISHING
W) WATER SPORTS
C) COLLECTING
S) SIGHTSEEING

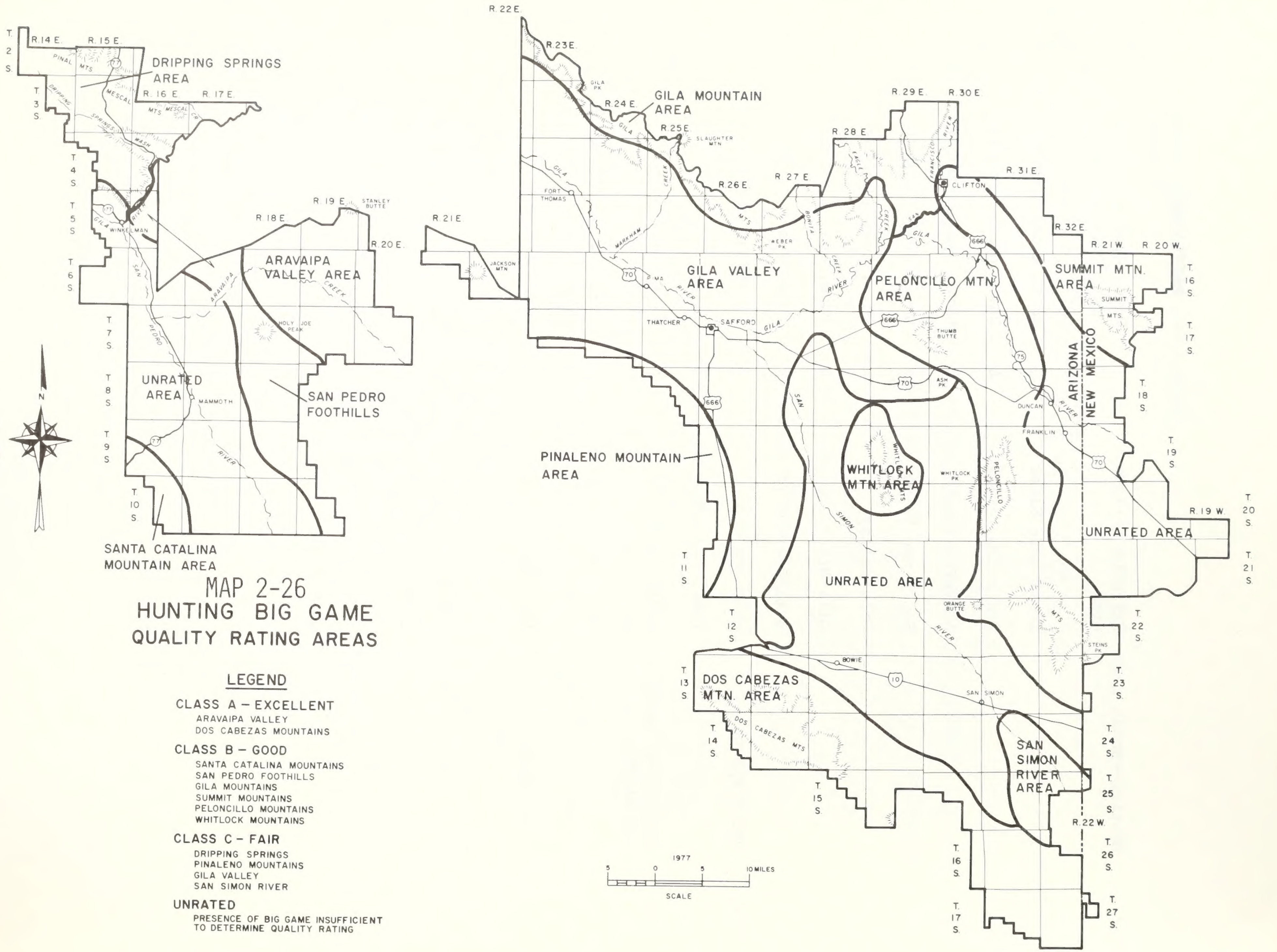
TABLE 2-17
RECREATION RESOURCE AREAS AND QUALITY

Map Number	Recreation Activity	Rating Area/Number	Class Value*	Comments
2-24	Fishing	Gila River-west of San Francisco River/F-1	B	Catfish, bullheads, sunfish
2-25	Hunting---big game	Santa Catalina Mountains-foothills	B	Deer, Javelina
		Dripping Springs Area	C	Deer, Javelina
		San Pedro Foothills	B	Deer, Javelina
		Aravaipa Valley	A	Deer, Javelina, mountain lion
		Pinaleno Mountains	C	Deer, Javelina, mountain lion
		Gila Valley	C	Deer, Javelina
		Gila Mountains	B	Deer, Javelina, mountain lion
		Whitlock Mountains	B	Deer, Javelina
		Dos Cabezas Mountains	A	Deer, Javelina
		Peloncillo Mountains	B	Deer, Javelina
		Summit Mountains	B	Deer
		San Simon River	C	Javelina

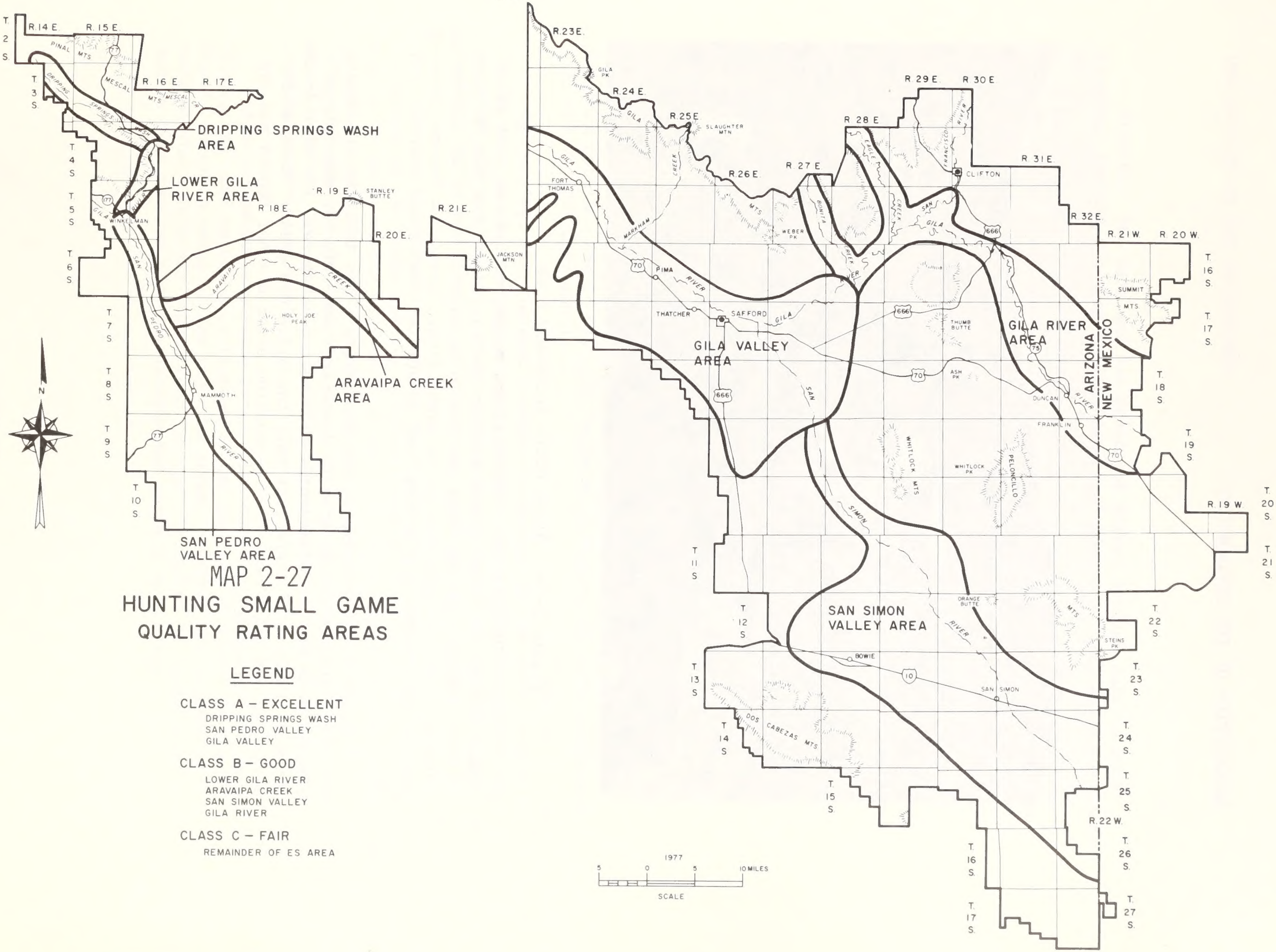
*Class A--Excellent, Class B--Good, Class C--Fair.

Value classes were determined using BLM Manual 6111, "Quality Evaluation of Recreation Use Opportunities."

2-25	Hunting--small game	Dripping Springs Area	A	Dove, quail, rabbits are found in each rating area
		Lower Gila River	B	Dove, quail, rabbit
		San Pedro Valley	A	Dove, quail, rabbit
		Aravaipa Creek	B	Dove, quail, rabbit
		San Simon Valley	B	Dove, quail, rabbit
		Gila Valley	A	Dove, quail, rabbit
		Gila River	B	Dove, quail, rabbit
		Remainder of ES Area	C	Dove, quail, rabbit
2-24	Water sports	Gila Box/W-1	C	Floatboating
		Lower Gila River/W-2	B	Floatboating
2-24	Collecting rocks and minerals	Black Hills/C-1	B	Fire agate, chalcedony
		Round Mountain/C-2	B	Fire agate, chalcedony, quartz, geodes
2-24	Sightseeing	Gila Box/S-1	B	Birdlife, scenery
		Bonita Creek/S-2	C	Birdlife
		Fishhook Canyon/S-3	C	Birdlife
		Markham Canyon/S-4	C	Birdlife
		Johnny Creek/S-5	C	Birdlife
		Livestock/ES area	C	Cattle, horses
2-24	Off-road vehicle use	ES Area	B	Four-wheel drive, vehicles, motor-cycles, dunebuggies



MAP 2-26
HUNTING BIG GAME
QUALITY RATING AREAS



MAP 2-27
HUNTING SMALL GAME QUALITY RATING AREAS

LEGEND

CLASS A – EXCELLENT
- DRIPPING SPRINGS WASH
- SAN PEDRO VALLEY
- GILA VALLEY

CLASS B – GOOD
- LOWER GILA RIVER
- ARAVAIPA CREEK
- SAN SIMON VALLEY
- GILA RIVER

CLASS C – FAIR
- REMAINDER OF ES AREA

Figure 2-14 Black Hills Rockhound Area

Off-Road Vehicle Use. Low-standard roads, dune areas, and sandy washes provide miles of varied terrain and challenges for the ORV user. Visitor use has thus far been too low to calculate, but it is increasing, and use areas are beginning to be identified. Livestock fences crossing low-standard roads, dry washes, and identified play areas restrict ORV use.

General Leisure--Camping and Picnicking. The majority of camping and picnicking in the ES area is dispersed, occurring at undeveloped sites. Such use is consequently difficult to measure. The visitor use shown in table 2-18 represents only the major use areas. Many of the developed and all undeveloped recreation sites are not fenced and are grazed by livestock.

Fishing. The Gila and San Francisco Rivers provide fair to good fishing, limited somewhat by low fish populations and high water turbidity.

Hunting--Big Game. Low to moderate deer and javelina populations in most rating areas limit hunting quality. Poor range condition is one of the reasons populations are low. Hunter access is adequate throughout the ES area. Hunter success varies from 15 percent to 36 percent, ranging from poor to good in the area.

Hunting--Small Game. Quail, dove, and rabbit hunting have been good to excellent in the ES area, with low to high populations. Populations fluctuate from year to year, directly affecting hunting quality.

Water Sports--Floatboating. High streamflow fluctuations in the Gila River cause variation in floating quality and season of use. In some dry years water releases from Coolidge Dam are minimal, resulting in very poor floating of the lower Gila. Moreover, range cross fences in the Gila Box and Lower Gila segments present hazards to floaters.

Collecting--Rocks and Minerals. Fire agate is the most plentiful collecting rock in the ES area and is most sought after by rockhounds (figure 2-14). Its quality varies from good to excellent, but the limiting rating factor is the amount of material. Range fences in rockhound areas have been obstacles to public access. In addition, a conflict of use occurs when rockhounds camp near livestock waters and frighten cattle. Cattle may also frighten visitors, and some rockhounds will not collect near cattle.

Sightseeing. The largest passive recreation use on public lands in the ES area is sightseeing, which is considered to involve all travelers on roads within the area. Heavy grazing has reduced the sightseeing quality of the rangeland by giving it an unhealthy appearance.

Other attractions of interest to sightseers in the ES area include livestock on the range and the birdlife found in riparian areas. People generally enjoy seeing livestock on the open range, but livestock numbers on public lands are low in comparison to vastness of the ES area. Livestock are thus infrequently seen, and even when seen they appear in small numbers, they are less appealing to sightseers than large herds grazing on good grassland.

Riparian habitats contain large populations and varieties of birds, and bird watching is frequently the purpose of a trip to these areas. Heavy grazing of the riparian areas, however, has eliminated much of the understory vegetation, reduced the number of large trees, and in turn reduced bird populations and variety of species.

TABLE 2-18
RECREATION VISITOR USE WITHIN ES AREA
(VISITOR DAYS)

Activity	1975	(Projected) 1990	Percent Increase
Hunting	12,350	12,940*	5
Watersports-floatboating	4,200	6,930**	65
Collecting- rock and minerals	700	1,430***	52
Sightseeing-general	214,455	386,000***	80
Sightseeing-historical	150	290*	69
Camping	4,900	6,900*	41
Picnicking	1,300	2,060*	58
Primitive values	6,900	13,700*	98
Total	244,955	430,250	

Projected visitor use data source:

*Arizona Outdoor Recreation Coordinating Commission, 1972.
**U.S. Department of the Interior, Bureau of Reclamation, 1976.
***U.S. Forest Service, 1976.

Use problems. Livestock operators and recreationists conflict over the use of land, as evidenced by lack of legal access to public lands, trespassing, gates being locked, gates being left open, livestock waters being built near recreation areas, recreationists camping near livestock waters, and visitors scaring and chasing cattle and shooting livestock near range improvements.

Visitor Use Data. Visitor use data were collected using BLM Manual 6112, "Visitor Use Analysis," (table 2-18). Visitor use figures for 1975 were calculated from reliable primary and secondary sources. The reliability of the 1990 projections for hunting, general sightseeing, and primitive activities is high due to good data sources. The visitor use data projections for floatboating, collecting, historic sightseeing, camping, and picnicking are less reliable because they are based upon statewide estimates.

Local residents are the predominant users of recreation resources in the ES area, engaging in 90 percent of the total recreation use (Arizona Outdoor Recreation Coordinating Commission, 1972). Hunting and rock collecting attract the majority of nonlocal visitors.

Livestock Grazing

Although 14 percent (31) of the licensees in the ES area live on their grazing units and manage them on a full-time basis, fewer do now than in the past. The majority of the licensees live in nearby communities and engage in farming or other businesses or jobs. Eighty-six percent (191) of the licensees conduct their grazing operations on a part-time basis, performing such tasks as checking their livestock; maintaining fences, gates, and water sources; supplying salt, mineral supplement, and supplemental feed; branding; gathering livestock; and shipping livestock to the market.

Two major types of livestock operations occur within the ES area: cow-calf and steer. Approximately 99 percent of the licensees have cow-calf operations, consisting of a base breeding herd of mother cows and bulls. The cows produce a calf crop each year, and some heifer calves are retained from each calf crop for breeding herd replacements. The balance of the calf crop is marketed along with old or nonproductive cows and bulls. Calves are sold between the ages of 6 and 12 months. Most operators do not establish a breeding season; bulls and cows are together yearlong. Birth and weaning of calves may occur at all times of the year, but most calves are born during the spring and fall.

One percent of licensees run steer operations, under which a base breeding herd is not maintained on the grazing unit. Steer operators obtain weaned calves or yearling steers elsewhere, hold them on the grazing unit up to a year, and then market them.

With a few exceptions, cattle and horses graze continuously yearlong on ES-area rangeland. Rather than move their cattle to new areas, most licensees prefer their cattle to become accustomed to grazing in certain areas and watering at familiar sources. Such a practice establishes a definite pattern of use and avoids upsetting cattle and temporarily changing livestock use patterns.

Sixteen grazing units, involving 283,384 acres of public lands, now operate under AMPs. (See chapter 1.) Operators periodically move their livestock to different areas within a grazing unit according to schedule, protecting portions of the range from livestock use for a time. In addition, some operators voluntarily move livestock at times on an informal basis, resting the range from livestock use. Data relating to livestock operations in 1976 appear in appendix J.

Livestock grazing on grazing units within the ES area has decreased since the establishment of the Safford District in 1936. Grazing statistical reports from 1941 through 1976 reveal that licensed livestock use has decreased by 100,000 AUMs or 34 percent. Licensed livestock grazing, however, has remained relatively constant during the past 5 years, averaging 197,945 AUMs, with yearly fluctuations of up to 3.9 percent of the average (appendix J). (Also refer to appendix B.) Data relating to livestock operations in 1976 appear in appendix I. Sixty-eight percent of the average licensed grazing use (134,855 AUMs) by livestock operations holding BLM licenses and leases occurs on public lands. Thus the livestock use on grazing units within the ES area depends to a large degree on forage produced on public lands.

This ES assumes that licensed active livestock use closely approximates actual livestock use within the ES area. Past actual livestock use, however, is impossible to determine for most grazing units. Most operators are reluctant to divulge information about their business operations, and attempts to determine actual livestock use have yielded inconclusive results. Although accurate counts have been obtained for specific units, an areawide count has not been made because of the required costs and time. Actual livestock use probably does not exceed licensed use areawide.

The number of livestock trespass cases in the Safford District has increased in the past 3 to 4 years, but this increase has probably resulted largely from increased manpower available to supervise livestock grazing more closely. In addition, not all trespass cases have involved exceeding licensed livestock use.

For a variety of reasons, some licensees probably use less AUMs than provided by active licensed use. By maintaining a high level of licensed livestock use, operators, according to changing conditions, can readily vary the amount of livestock up to the maximum allowable without making applications for changes in licensed use. Moreover, maintaining a high level of licensed livestock use can imply a comparable grazing capacity and similar sale value for the unit.

Agriculture

Crop Production. The ES area contains four major agricultural areas, totalling 81,800 acres. Two areas are located along the Gila River, one in the Safford Valley with 40,700 acres, and the other in the Duncan Valley with 6,300 acres. The third is located in the Bowie-San

Simon area near the New Mexico State line, where 32,800 acres are cultivated. The fourth area is on the extreme west side of the ES area between the towns of Mammoth and Winkelman, along the San Pedro River. Approximately 2,000 acres are cultivated in this area.

Crops in the ES area are irrigated from both surface and groundwater sources. Most of the cultivated lands along the Gila River are irrigated with water diverted from the river, but numerous drilled wells supplement the river water. The farmland in the San Simon Valley near San Simon and Bowie is irrigated from deep wells as is the farmland along the San Pedro River.

Most of the farmland in the ES area is used to grow field crops, including barley, sorghum, wheat, cotton, corn, and alfalfa. Some land is planted to permanent pasture, but its total acreage is much smaller than that for row crops. Table 2-19 displays estimated field crop acreage for the ES area during 1975.

TABLE 2-19
FIELD CROP ACRES FOR 1975

Crop	Acres
Cotton	13,200
Barley	25,800*
Wheat	10,000
Alfalfa	13,800
Sorghum	43,500*

Source: Arizona Crop and Livestock Reporting Service, 1976a**

*Sorghum and barley are often double cropped. Barley is planted in the winter and harvested in the spring. Sorghum is planted in the summer and harvested in the fall.

**Agricultural statistics for the ES area are not kept on the subcounty level. Acreages used in this report are derived from county statistics. Since the ES area divides several counties, the acreage figures for each crop are estimates.

Livestock Production. Cattle production is a major enterprise in the ES area. Much of the grain and hay grown is fed to local livestock. The area has only one major cattle feedlot--near Pima, with a 5,000-head capacity. Several hundred producers, however, feed from 1 to 50 or more head of livestock on farms and ranches on private land within the ES area. During 1975 approximately 10,000 head of cattle were fed (Arizona Crop and Livestock Reporting Service, 1976a), and 16,500 cattle were grazed on rangeland in the ES area. Most of the ranches in the area are not dependent on agricultural land to sustain their livestock. Because of intensive cultivating practices and double cropping, an estimated 90 percent of the area's crop aftermath is not available for livestock feed.

Pig and hog raising is a major enterprise along the Gila Valley, where approximately 17,000 pigs were fed for slaughter during 1975 (Arizona Crop and Livestock Reporting Service, 1976a). The pigs eat large amounts of grain grown in the area. Although cattle and hogs are fed locally, an estimated 20 to 30 percent of locally grown alfalfa and feed grains are exported from the area.

Mineral Resources

The ES area is and has historically been the scene of important economic mineral development, including some of the largest mining and metallurgical complexes in the United States. Copper is the most important mineral produced, with substantial quantities of molybdenum, silver, and gold as associated byproducts. Copper smelters require limestone for the treatment of ores, and limestone is mined near the copper smelters. Other minerals and materials mined in the past or presently produced in small amounts include lead, zinc, manganese, zeolites, diatomaceous earth, pumice, marble, building stone, sand, and gravel.

Water Uses

The largest use of water in the area is for agriculture. During 1975, 109,356 acre-feet of water were diverted from the Gila River to irrigate approximately 32,512 acres in the Safford Valley. Another 16,419 acre feet were diverted in the Duncan Valley to irrigate 6,300 acres (Gila Water Commissioner, 1975).

Groundwater, as well, is used heavily for agriculture. During 1975, an estimated 25,000 acre-feet of groundwater were pumped for irrigation in the Duncan Valley, 120,000 acre-feet in the Safford Valley, and 12,000 acre-feet in the Winkelman area (Arizona Water Commission, 1975). Use of water for purposes other than irrigation is insignificant.

Land Use Plans, Controls, and Constraints

Local Planning and Zoning

Parts of seven counties lie within the ES area: Graham, Greenlee, Cochise, Gila, and Pinal in Arizona, and Grant and Hidalgo in New Mexico. Each of the Arizona counties has approved and adopted planning and zoning ordinances. These ordinances apply only to private land and have little bearing on the proposed action. Most of the private land immediately next to public lands is zoned as general or rural residential. Such zoning permits rural residential, agricultural, and livestock grazing uses. Such land must be rezoned, however, in order to permit such uses as industrial and commercial. This type of zoning exists as holding ordinances for land that has not been needed for any special nonrural use.

Neither Grant nor Hidalgo Counties has planning or zoning ordinances outside incorporated towns. New Mexico State law, however, requires that subdivisions comply with adopted statewide subdivision ordinances.

Constraints by Other Government Agencies

The Interrelationship section of chapter 1 discusses relationships between BLM and other government agencies but identifies no constraints on the proposed action.

Transportation and Utilities

Roads and Trails

The ES area is well served by paved highways, improved roads, and primitive roads. The ES area has 316 miles of paved highways. Moreover, BLM maintains 762 miles of roads within the ES area. Of these, approximately 378 miles are graded or otherwise improved for all-weather travel. The remainder are unimproved seasonal roads that are generally maintained once or twice a year following heavy storms.

Utilities

Within the ES area hundreds of miles of rights-of-way have been granted to individuals, municipalities, and large companies for electric power transmission lines, telephone and telegraph lines, underground natural gas pipelines, and communication sites.

An estimated 5,000 acres of public lands in the ES area are under right-of-way for various utilities. Ninety percent or more of the land under right-of-way, however, is still accessible and its forage is available for livestock grazing.

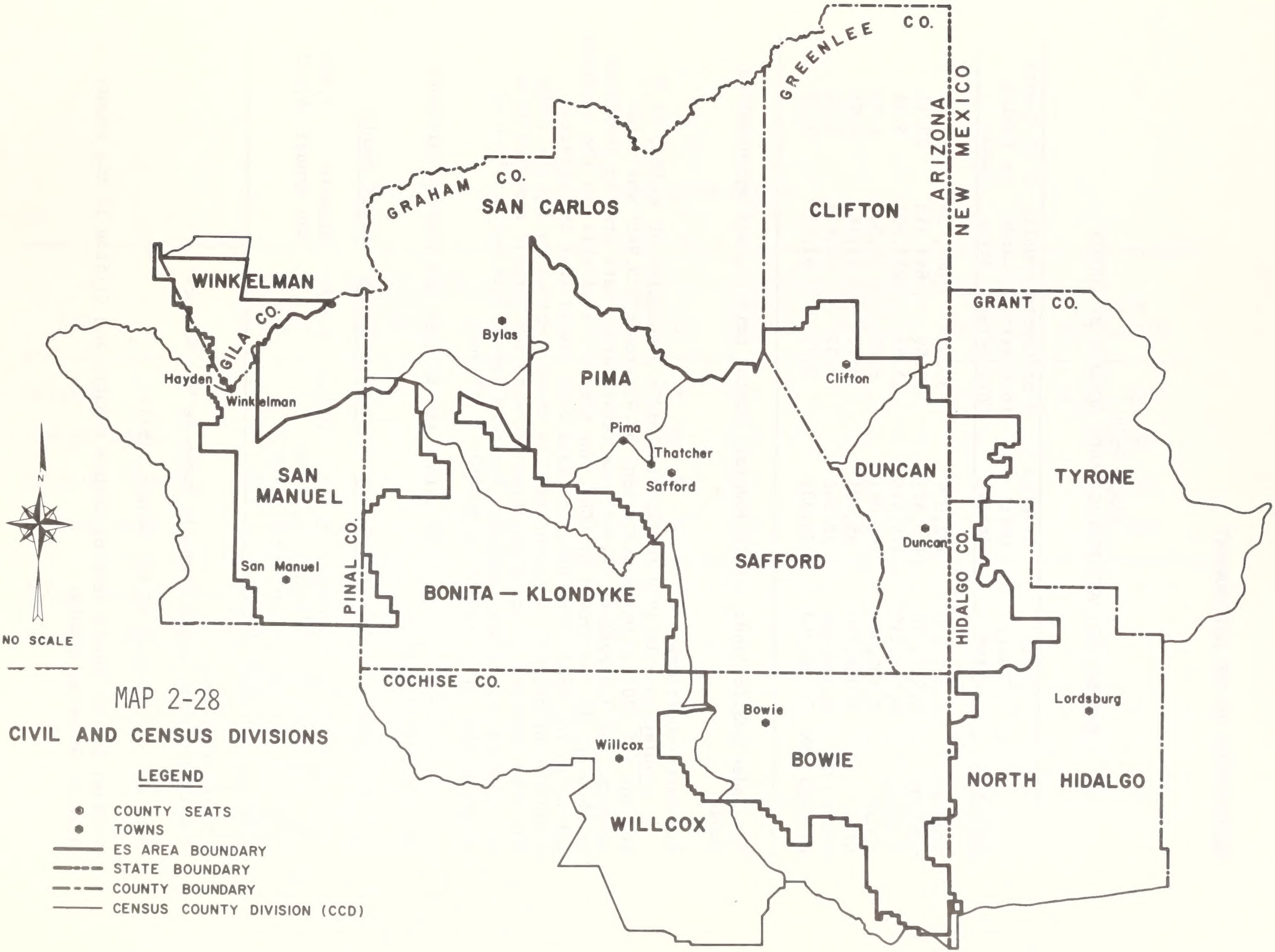
Economic and Social Conditions

The Upper Gila-San Simon ES area delineation was based upon BLM planning units, which do not correspond to areas (such as counties) for which economic and social data are readily available. The closest approximation of the ES area for which statistics are published was found to be a combination of census county divisions (CCDs), which, along with county boundaries, are superimposed by the ES-area boundary on map 2-28. Statistics for the ES area refer to San Manual CCD, Pinal County; Winkelman CCD, Gila County; Bowie and Willcox CCDs, Cochise County; all of Greenlee County; all of Graham County except the San Carlos CCD; north Hidalgo CCD, Hidalgo County, New Mexico; and Tyrone CCD, Grant County, New Mexico. Statistics for the ES area thus refer to these selected CCDs.

Although the area of the CCDs is considerably larger than the ES area, the CCD boundaries still best meet the three major goals for which they were selected: (1) to include most if not all of the ES area, (2) to omit large population centers outside the ES area that would distort the data, and (3) to make the percentage of a county's area within the selected CCDs as proportionate as possible to the percentage of the county in grazing allotments. Table 2-20 presents total county acreages and the percent of each ES-area county in grazing units. It is the basis for the third goal.

Where specific data are not available for these selected CCDs, a surrogate is used, consisting of Greenlee, Graham, and Cochise Counties. These counties contain a major portion of the grazing units and public lands in the ES area (table 2-20). These counties also contain over 60 percent of the ES area's population. These statistics suggest that the highest proportion of the economic impacts would occur within the three counties. Less severe economic impacts would be expected to occur in the remaining portion of the ES area.

Where available, data are presented for the CCDs because these areas are most representative of the ES area. Much of the data required for analysis, however, are available only on a county basis.



MAP 2-28

CIVIL AND CENSUS DIVISIONS

LEGEND

- COUNTY SEATS
- TOWNS
- ES AREA BOUNDARY
- STATE BOUNDARY
- COUNTY BOUNDARY
- CENSUS COUNTY DIVISION (CCD)

TABLE 2-20
GRAZING UNIT AND PUBLIC LANDS ACREAGE BY COUNTY

County	Total County Acres	Grazing Unit Acres*	% of County in Grazing Unit Acres	Public Lands Acres	% of County in Public Lands
Greenlee	1,202,560	422,036	35.09	207,734	17.27
Graham	2,955,520	975,427	33.00	683,113	23.11
Cochise	4,003,840	475,478	11.88	213,907	5.34
Pinal	3,432,960	192,041	5.59	59,513	1.73
Gila	3,038,720	95,701	3.15	61,167	2.01
Grant, NM	2,540,800	59,048	2.32	39,674	1.56
Hidalgo, NM	2,206,080	126,331	5.73	81,601	3.70

*Includes public lands, other Federal, State, private, and uncontrolled lands.

Economic Conditions

Population. In 1970 the ES area had a population of 50,965, 41.8 percent (21,320) of which was urban, 50.9 percent (25,948) was rural nonfarm, and 7.3 percent (3,687) was rural farm. Data are not available to show population growth by CCDs, but they are available for the counties making up the area. The data in table 2-21 reveal that the relative stability or decrease in population in these counties during the 1960s has been reversed. This population increase has largely resulted from net immigration to the counties, but this growth rate has not been as great as the rapid population growth of Arizona.

The largest towns near or within the ES area and their populations in 1970 are as follows:

Graham County		Greenlee County		Cochise County		Pinal County	
Safford	5,333	Clifton	5,087	Wilcox	2,568	Mammoth	1,953
Thatcher	2,320	Stargo	1,194**			San Manuel	4,332
Pima	1,184	Plantsite	1,077**				
Bylas	1,115*	Duncan	773				

*unincorporated
**unincorporated areas commonly known as New Morenci

Source: U.S. Bureau of the Census, 1971a

Safford is the county seat of Graham County, and Clifton is the county seat of Greenlee County.

TABLE 2-21
POPULATION AND PERCENT POPULATION CHANGE

AREA	PERCENT CHANGE 1960 - 1970 ANNUAL CHANGE	NATURAL INCREASE	NET MIGRATION	1970 POPULATION	PERCENT CHANGE 1970 - 1975 ANNUAL CHANGE	NATURAL INCREASE	NET MIGRATION	1975 POPULATION
Arizona	3.1	1.6	1.5	1,775,399	4.3	1.1	3.2	2,224,000
Graham County	1.6	1.7	*	16,578	3.8	0.9	2.9	20,200
Greenlee County	-1.1	1.4	-2.4	10,330	2.7	1.8	0.9	11,900
Cochise County	1.2	1.8	-0.8	61,918	3.5	1.4	2.1	74,300

* Less than 0.05 percent

Source: Arizona Department of Economic Security, 1975b

The population densities of the individual counties within the ES area are much smaller than that of the State of Arizona, which is 16 persons per square mile. The density of Graham County is 4 persons per square mile; Greenlee County, 5 persons per square mile; and Cochise County, 10 persons per square mile (U.S. Bureau of the Census, 1971a). The higher population density of Cochise County results from the larger towns in the southern part of the county but outside the ES area (map 2-28). If the SMSAs in Arizona were excluded from the State (Phoenix with all of Maricopa County and Tucson with all of Pima County), Arizona's population density would drop to 5 persons per square mile.

The age distribution for the ES area, as shown in the following table, reflects a larger percentage of dependent children and a smaller percentage of residents in the 65 and older category. These differences can be explained by the lack of retirement communities within the ES area.

PERCENTAGE OF POPULATION BY AGE CATEGORY

	Under 5	5-14	15-24	25-34	35-44	45-54	55-64	65 +
ES Area	10.5	23.8	17.2	12.0	11.3	10.5	8.1	6.6
Arizona	9.0	21.4	18.0	12.2	11.0	10.7	8.6	9.1

Source: U.S. Bureau of the Census, 1971b, 1971d.

Employment. Employment statistics available for the ES area are recorded both by occupation and by industry. By occupation, 1,372 persons in the area are farmers or farm laborers, amounting to only 8.3 percent of the area's total employment. By industry, agricultural workers are included in the "other industry" category, which also includes mine workers. The ES area has 6,327 workers in the other industry category, amounting to 38.3 percent of the total employment.

In the three-county area the most important economic sectors are Wholesale and Retail Trade, 19.4 percent; Professional and Related Services, 16.0 percent; Public Administration, 14.4 percent; and Mining, 13.0 percent of those employed. Mining is especially significant in Greenlee County, where it employs 48.1 percent of the county's workers. The Agriculture, Forestry and Fisheries sector ranks sixth overall and involves 7.0 percent of the total employment.

Table 2-22 shows 1976 employment data. Between 1970 and 1976 the labor force has grown in all three counties. Graham County has declined in construction employment and increased in services and

TABLE 2-22
EMPLOYMENT IN JUNE 1976

	Graham County	Greenlee County	Cochise County
Agriculture*	675	100	1,200
Mining	175	2,325	425
Construction	175	350	625
Manufacturing	225	525	1,500
Transportation & Public Utilities	150	75	925
Wholesale, & Retail Trade	1,000	400	3,325
Finance, Real Estate	100	25	425
Services	725	100	2,300
Government	1,525	475	7,075
Other Non-farm	600	325	2,150
Adjustment**	825	-475	-300
Total	6,175	4,225	19,650

*Employment information is not available for specific components of agriculture, such as ranching.

**Adjustment for multiple job holdings, labor-management disputes, and commuting across county lines.

Source: Valley National Bank of Arizona, 1976 government employment. Greenlee County has grown in mining and government employment, but services have declined. And Cochise County has shown a decline in mining, manufacturing, and services but an increase in government employment (Valley National Bank of Arizona, 1976).

Unemployment in the three-county area fluctuates around State averages (table 2-23). Greenlee County's unemployment rate has been consistent--slightly lower than the State average. Graham and Cochise counties have fluctuated above and below State rates. A weighted average of unemployment in the three counties closely follows State averages.

Income. Personal income includes wages, salaries, property income, and transfer payments (old age pensions, unemployment compensation, social security, and welfare payments). Characteristics of personal income in Arizona and in Graham, Greenlee, and Cochise Counties are shown in the table below. In 1970 all three counties had per capita and mean incomes below those of the State, and only Greenlee County exceeded the State in median income.

PERSONAL INCOME CHARACTERISTICS

	Arizona	Graham County	Greenlee County	Cochise County
Per capita income	$2,945	$1,919	$2,891	$2,563
Median income	9,187	7,262	10,044	8,333
Mean income	10,501	7,976	10,332	9,160
Percent below poverty level	11.5%	19.1%	8.1%	13.4%

Source: U.S. Bureau of the Census, 1971b.

In 1970, 15.2 percent of the ES area's population lived on incomes below the poverty level, a percentage nearly 4 points greater than that of the State. Of Graham, Greenlee, and Cochise Counties, only Greenlee County had a smaller percentage of its population below the poverty level than did the State. In 1969 the poverty level for unrelated individuals averaged $1,834, and the poverty level for families averaged $3,388 (U.S. Bureau of the Census, 1971b).

Income distribution for the State and the three counties is shown in table 2-24. In Arizona 35 percent of family and unrelated individual income was below $5,000 and 35 percent was above $10,000. In Graham

TABLE 2-23
UNEMPLOYMENT RATES
(PERCENT OF LABOR FORCE)

Political Division	Average for 1970	March 1974	June 1974	Sept. 1974	Dec. 1974	March 1975	June 1975	Sept. 1975	Dec. 1975
Graham County	5.1	8.2	8.6	6.3	9.3	9.7	12.4	9.9	12.1
Greenlee County	3.7	4.7	5.6	5.0	5.8	5.9	7.4	6.5	7.9
Cochise County	3.7	5.7	6.3	5.3	6.7	8.5	10.7	10.3	10.1
Weighted Average	-	6.0	6.6	5.4	7.1	8.4	10.6	9.7	10.3
Arizona State	4.2	5.2	5.8	5.5	7.3	9.6	10.5	9.2	8.8

Source: Arizona Department of Economic Security, 1975a

TABLE 2-24
INCOME DISTRIBUTION OF FAMILIES AND UNRELATED INDIVIDUALS

Income	Arizona	%	Graham County	%	Greenlee County	%	Cochise County	%
Under 1,000	46,513	7.8	162	4.5	28	1.0	532	3.6
1,000- 1,999	47,354	8.0	194	5.4	62	2.3	597	4.0
2,000- 2,999	40,433	6.8	235	6.5	70	2.6	747	5.0
3,000- 3,999	37,842	6.4	228	6.3	109	4.0	834	5.6
4,000- 4,999	35,984	6.1	313	8.7	57	2.1	930	6.3
5,000- 5,999	36,224	6.1	294	8.1	77	2.9	1,049	7.1
6,000- 6,999	36,397	6.1	398	8.3	86	3.2	1,189	8.0
7,000- 7,999	38,127	6.4	303	8.4	180	6.7	1,176	7.9
8,000- 8,999	36,291	6.1	278	7.7	284	10.5	1,138	7.7
9,000- 9,999	33,151	5.5	216	6.0	381	14.1	1,017	6.8
10,000-11,999	59,212	10.0	423	11.7	685	25.4	1,901	12.8
12,000-14,999	61,535	10.4	356	9.9	355	13.2	1,577	10.6
15,000-24,999	66,598	11.2	268	7.4	282	10.5	1,866	12.5
25,000-49,999	15,285	2.6	39	1.1	33	1.2	305	2.0
50,000 +	3,256	.5	---	---	9	.3	8	.1
Total	594,202	100.0	3,607	100.0	2,698	100.0	14,866	100.0

Source: U.S. Bureau of the Census, 1971c

County 31 percent of family and unrelated individual incomes was below $5,000 and 30 percent was above $10,000. Greenlee County had 12 percent of such incomes below $5,000 and 51 percent above $10,000, and Cochise County had 24 percent below $5,000 and 38 percent above $10,000.

In 1973, total earnings (wages, salaries, and proprietor's incomes) in Cochise County amounted to $271,321,000. In Graham and Greenlee Counties total earnings amounted to $36,051,000 and $70,113,000 respectively. The sum of these figures represents 4.9 percent of total State earnings (U.S. Department of Commerce, Bureau of Economic Analysis, 1975).

In 1970 government was a larger source of earnings in the ES area than was agriculture. Farming was the source of 4 percent of the total earnings in the State, 8 percent in Cochise county, 15 percent in Graham County, and 2 percent in Greenlee County. Government, on the other hand, provided 15 percent of total earnings in the State, 55 percent in Cochise County (mostly Federal), and 34 percent in Graham County (mostly State and local).

Property Tax. Arizona counties tax not only real estate but also farm and ranch machinery, dairy and beef cattle, swine, horses, poultry, field crops, orchards and vineyards, and utility operating equipment.

In 1975 Graham County's taxable property had a full cash value of $177,579,376, which was assessed at an average of 24 percent or $41,749,864. The county's 273 parcels of ranch property had a full cash value of $2,760,359 and an assessed value of $482,806, 17 percent of full cash value. Beef cattle had a full cash value of $2,306,380 and an assessed value of $418,497, 18 percent of full cash value (Arizona Department of Revenue, 1975). The tax rate per $100 assessed valuation ranged from $7.08 to $10.44, depending upon the school and fire districts (Arizona Tax Research Association, 1975).

The full cash value of property in Greenlee County in 1975 amounted to $336,784,774, which had an assessed value of $174,695,695 or 52 percent of full cash value. The 202 parcels of ranch property in Greenlee County had a full cash value of $518,808 and an assessed value of 17 percent of full cash value or $89,150. The county's beef cattle had a full cash value of $1,327,367 and an assessed value of 18 percent of full cash value or $238,940 (Arizona Department of Revenue, 1975). The tax rate per $100 assessed valuation ranged from $2.02 to $9.10 (Arizona Tax Research Association, 1975).

In Cochise County, the full cash value of all taxable property in 1975 amounted to $621,893,236, of which 26 percent or $162,736,306 was the assessed value. The County's 2,001 parcels of ranch property had a full cash value of $15,729,978 and an assessed value of $2,738,475 or

17 percent of full cash value. Beef cattle had a full cash value of \$6,443,992 and an assessed value of \$1,160,592, 18 percent of full cash value (Arizona Department of Revenue, 1975). The tax rate per \$100 assessed valuation in Cochise County ranged from \$7.42 to \$15.44 (Arizona Tax Research Association, 1975).

Taylor Grazing Act Apportionments to Counties. The Taylor Grazing Act requires certain funds recovered thereunder to be reallocated to the State for the benefit of the counties generating those funds. Arizona appropriated such funds to Cochise, Graham, and Greenlee Counties as shown in table 2-25.

Economics of the Livestock Industry. In Graham, Greenlee, and Cochise Counties, estimated 1973 agricultural sales amounted to \$84,977,000 (Arizona Crop and Livestock Reporting Service, 1976b). Estimated farm earnings (wages, other labor income, and proprietor's income) for the three counties amounted to \$27,594,000. Estimated total earnings for the counties amounted to \$377,485,000. Earnings are considered a good measure of the income derived from a specific economic activity.

The three counties had a total of 138,000 cattle and calves as of January 1, 1976 (Arizona Crop and Livestock Reporting Service, 1976a). The distribution of animal unit months (AUMs) for each county in the ES area is shown in table 2-26. Cochise, Graham, and Greenlee Counties represent 76 percent of the AUMs on public lands in the ES area and 84 percent of other (State and private land in grazing units) AUMs in the area.

Cattle and calves are estimated to be responsible for 2.6 percent of earnings in Cochise County, 1.3 percent in Greenlee County, and 8.5 percent in Graham County--and \$11,148,000 for the three counties. Earnings from cattle and calves amount to 2.95 percent of total earnings for the three counties. Table 2-27 shows the estimated earnings attributable to public lands and other land within grazing units.

Cochise, Greenlee, and Graham Counties have an income multiplier of 1.226 for livestock excluding dairy cattle and poultry (Bureau of Land Management, 1976). The income multiplier for any sector of the economy measures the total change in personal income resulting from a one dollar change in income to that sector. One dollar livestock income thus creates \$1.226 dollars of income throughout the area as the first dollar is exchanged secondarily. Using this multiplier, one can calculate that from \$613,000 of direct income \$752,000 (0.20 percent of total earnings) is generated from public lands AUMs, that from \$332,000 of direct income \$407,000 (0.11 percent of total earnings) is generated from other AUMs within grazing units, and that from a total of \$945,000 of direct income \$1,157,000 (0.31 percent total earnings) is generated from grazing units in the three counties.

TABLE 2-25
FUNDS APPORTIONED TO COUNTIES UNDER THE TAYLOR GRAZING ACT
(IN DOLLARS)

County	Fiscal Year 1973		Fiscal Year 1974		Fiscal Year 1975		Fiscal Year 1976	
	Schools & Roads	Range Improvements	Schools & Roads	Range Improvements	Schools & Roads	Range Improvements	Schools & Roads	Range Improvements
Cochise	4,409	1,553	5,598	1,735	6,644	1,720	11,636	2,362
Graham	675	4,659	817	5,190	906	5,148	1,630	7,068
Greenlee	---	1,269	570	1,416	---	1,406	---	1,930
Total	5,084	7,481	6,985	8,341	7,550	8,274	13,266	11,360

Source: Arizona State Treasurer's Office, 1976

TABLE 2-26
AUMS WITHIN BLM GRAZING UNITS BY COUNTY

County	Public Lands		Other		Total	
	AUMs	%	AUMs	%	AUMs	%
Cochise	20,875	15	10,674	17	31,549	16
Gila	6,691	5	---	0	6,691	3
Graham	55,515	41	19,937	32	75,452	38
Greenlee	26,566	20	22,400	35	48,966	25
Pinal	8,405	6	242	--	8,647	4
Grants, New Mexico	4,927	4	2,937	5	7,864	4
Hidalgo, New Mexico	11,876	9	6,900	11	18,776	10
Total	134,855	100	63,090	100	197,945	100

TABLE 2-27
ESTIMATED EARNINGS ATTRIBUTABLE TO PUBLIC LANDS
AND OTHER LAND WITHIN GRAZING UNITS

	PUBLIC LANDS	Other	Total
Cochise County	$191,000	$98,000	$289,000
Greenlee County	173,000	145,000	318,000
Graham County	249,000	89,000	338,000
Total	$613,000	$332,000	$945,000

In 1976 the ES area had 193 grazing units and 17,162 animal units (AUs). The mean number of AUs per grazing unit was 101, and the median number of AUs per grazing unit was 31. The distribution of AUs by grazing unit in 1976 is shown as follows.

Animal Units	No. of Grazing Units
0 - 49	117
50 - 99	24
100 - 149	15
150 - 199	9
200 - 249	8
250 - 299	9
300 +	11
Total	193

The mean number of AUMs per grazing units in 1976 was 775, and the median number of AUMs per grazing unit was 254. The distribution of AUMs on public lands by grazing unit in 1976 is shown as follows.

No. of AUMs	No. of Grazing Units
0 - 599	139
600 - 1199	22
1200 - 1799	14
1800 - 2399	6
2400 - 2999	5
3000 +	7
Total	193

A study of cattle ranches in the Southwest (consisting of 20 counties in west Texas, 11 counties in southern New Mexico, and 3 counties in southeastern Arizona) revealed that from 1964 to 1972 the average size herd ranged from 360 to 380 head (U.S. Department of Agriculture, Economic Research Service, 1974). Few of the ranchers in the ES area have herds as large as this average size. Only 11 of the allotments have breeding herds of 300 or more head, which is considered to be an economic unit. 1/

Attitudes and Values

According to Smith and Martin (1972) the goals and attitudes of Arizona ranch owners may be grouped into four major categories: (1) ranch fundamentalism, (2) conspicuous consumption/speculative attitudes, (3) economic satisficing, and (4) ties to the local area and community.

1/ An economic unit is a business organization large enough to take advantage of certain economics of scale that permit it to realize a normal rate of return on investments.

Ranch fundamentalism is the attitude "that being a cattle rancher leads to a higher state of total well-being than an alternative mode of making a living and way of life could provide" (Smith and Martin, 1972). Adhered to by both old and new ranchers, ranch fundamentalism includes separate but interrelated principles relating to the family, rural values, and the land.

Conspicuous consumption/speculative attitudes involve the rancher's desire to receive the social and psychological benefits from ranch ownership while being actively interested in the possibility of his ranchland's increasing in value. Conspicuous consumption/speculative attitudes seem to be held most frequently by recent purchasers of ranchland who have permanent residences in large urban areas. The presence of these attitudes, however, does not mean that the land will increase in value or that the ranch owner will actually sell the land.

Economic satisficing attitudes consist of two components: income satisficing and wealth satisficing. Income satisficing explains the economic behavior of ranchers who receive a poor or negative return on their ranching investment and do not derive all of their income from ranching, yet expect their children to become ranchers. For a rancher with this attitude, maintaining the ranch as a home and a way of life is more important than the ranch's showing a profit, providing other income can supplement ranching.

The wealth satisficing attitude is held by ranchers who believe that holding land for its increase in value is worthwhile and who hope to increase the size of their ranch, yet are satisfied with the low return on their ranching investment.

The final attitudinal category involves ties to the local area and community, which reflect the strength of rancher adherence to ranch fundamentalist and economic satisficing attitudes. Most ranchers are satisfied with their local area and are reluctant to relocate (Smith and Martin, 1972).

Depicting these four rancher attitudes as being separate and independent values of ranch life would be difficult if not impossible. Although some ranchers may be motivated more by one value than another, many attitudes reflect various combinations of these values.

Ranchers in the ES area are believed to adhere strongly to ranch fundamentalism and to have strong ties to the local area and community. They probably relate less to conspicuous consumption/speculative values. The role of economic satisficing is extremely difficult to evaluate without an intimate knowledge of a rancher's financial condition and goals. In theory, economic satisficing could coexist with both ranch fundamentalism and conspicuous consumption/speculative attitudes and could occur in some cases as a result of close community ties.

The assessment of these values is based on information from the Safford District staff, whose insight has been gained through working relationships with ranchers and personal knowledge of the people and the area. The percentage figures, however, reflect staff judgements.

In attempting to quantify these values, one must make certain assumptions. First, the groups adhering to ranch fundamentalism and having strong community ties (1) obtain over 50 percent of their income from ranching, or (2) have lived in the community over 10 years. Over 60 percent of the ES area's permittee-ranchers are estimated to fall in these categories. This estimate was based on both criteria, but double counting was eliminated.

Second, adherents of conspicuous consumption/speculative values were assumed to be ranchers (1) relatively new in the area (living there less than 10 years), and (2) not dependent upon ranching for their livelihoods (receiving less than 50 percent of their incomes from ranching). Less than 40 percent of the rancher-permittees are estimated to fall in this category.

Attitudes of local communities vary. The smaller communities in the area, especially those highly dependent on ranching for their existence or those having numerous ranchers in residence, tend to be highly supportive of the ranchers. The larger communities, on the other hand, may be less supportive of ranchers because they are less economically dependent upon ranching for trade.

Ranchers generally are a cohesive group holding similar views and concerns for ranch problems and community goals. Ranchers enjoy considerable active or passive support from their local communities, although some special interest groups in the local communities may be at odds with them on such issues as environmental quality, access to public lands, and wildlife.

All groups could be expected to support limited economic and social growth only to the extent of retaining a rural lifestyle. Many feel that there is too much government control and that they would fare better if they were left alone.

FUTURE ENVIRONMENT

The Future Environment section of chapter 2 describes the environment of the ES area as resource managers envision it 15 years from the present, should the proposed action not be adopted and BLM's management of the public lands in the area remain the same as in the past. This discussion assumes the following: that the present amount of authorized livestock use on all grazing units would remain the same with no major adjustments; that the existing 16 Allotment Management Plans (AMPs) would continue to be operated without major changes but that no new AMPs would be implemented; that no additional public lands would be classified and managed as ephemeral range; and that range improvements would be constructed only as needed for the orderly use of the range.

This analysis projects 15 years into the future, principally because this is the time period used for projections in AMPs and because such a period of time is used in the chapter 3 analysis of long-term impacts of the proposed action.

Unlike the Present Environment section of chapter 2, the Future Environment section discusses only the ES area's resources expected to be significantly impacted by the proposed action. It excludes environmental elements, such as climate, topography, and geology, which would be expected to change little in the future.

Soils

If the proposed action is not adopted, sediment yield is not expected to increase significantly. The badly eroded areas next to the San Simon River, where not protected by dikes or detention dams, would continue to erode at about the present rate (2,330 acre-feet per year), destroying potentially valuable rangeland. Those areas identified as problem areas for wind and water erosion, moreover, would not improve.

Water Resources

If the proposed action is not adopted, neither water quantity, quality, nor salinity is expected to change significantly. Sediment loads might increase slightly but not significantly.

Vegetation

If livestock numbers are not reduced on public lands in the ES area, the vegetation resource, as a whole, would deteriorate in the next 15 years. This prediction is based on the following assumptions:

(1) That the weather pattern will continue much as it has been in the past 5 years--1 year of above-average precipitation followed by 3 or more years of below-average precipitation as shown below.

AVERAGE ANNUAL PRECIPITATION (IN INCHES)*

1949 through 1975	1971	1972	1973	1974	1975
8.60	6.63	11.21	7.94	8.56	6.11

*Recorded at the University of Arizona Agriculture Experiment Station at Lone Star, Arizona.

(2) That licensed active use by allottees will not change considerably.

(3) That licensed active use will be approximately the same as actual use.

The following changes expected to occur are discussed by vegetation type. Exceptions to these predictions are likely to occur on grazing units that have either proper livestock numbers or a functioning livestock management system or both.

Grassland Type

Desert Grassland. The desert grassland would continue to decrease slowly in size as the principal grass plants, tobosa grass and alkali sacaton, die and are not replaced by new plants. Undesirable plants such as snakeweed, burroweed, and creosotebush would increase in the area. If the ground cover is not replaced by undesirable plants, the amount of bare ground would increase and gullying would become more evident. These changes would occur slowly and would not be readily visible. Photos and permanent line transects, however, would clearly show the changes. Range condition of the grasslands is estimated to change as follows: excellent, decrease by 1 percent; good, decrease 6 percent; fair, increase 2 percent; and poor, increase 5 percent. See table 2-28.

Mountain Grassland. In the mountain grassland vegetation type the percent composition of grasses not resistant to heavy grazing pressures (sideoats grama) would decrease, whereas the percent composition of grasses favored by heavy grazing (curly mesquite) would increase. Undesirable shrubs and half-shrubs (turpentine bush, gymnosperma, snakeweed, burroweed) would increase at the expense of desirable grasses and half-shrubs (Wright's buckwheat).

This possible change can be best illustrated by the information obtained from line transects conducted in 1976 at an exclosure in the Dos Cabezas Mountains. A comparison between heavily grazed and ungrazed areas showed that woody species canopy cover had increased 146 percent in grazed areas and grass basal cover had decreased 497 percent.

Undesirable species composition also increased 258 percent with heavy grazing (Humphrey, Bingham, and Huschle, 1976). Table 2-28 displays change in range condition estimated to occur in 15 years under existing range management.

Mountain Shrub Type

Changes in the mountain shrub vegetation type would be similar to that expected in the mountain grassland vegetation type. Mountain mahogany would continue to be heavily grazed, and only minimal reproduction would occur. Shrubby species would continue to increase, uncontrolled by wildlife. Much of the mountain shrub type lacks enough understory to carry a fire. This vegetation type would have a downward trend as evidenced by the Dos Cabezas exclosure information.

Barren Type

The vegetation on the barren type would not change, but the area of this type would increase slightly. The size of mine waste dumps would increase but not as a result of livestock grazing. The size of barren areas along the San Simon and Gila Rivers would slowly increase and gullying would become more evident.

Pinyon-Juniper Type

The pinyon-juniper vegetation type would remain virtually unchanged, since most of it is either inaccessible to livestock or on grazing units in good condition.

Broadleaf Riparian Type

The broadleaf riparian vegetation type would deteriorate as livestock use in the bottom areas continues. Reproduction of velvet ash, cottonwood, sycamore, and other riparian tree species would remain low. Mesquite would continue to increase as the seeds are disseminated by livestock. Only in the Aravaipa Canyon Primitive Area would broadleaf riparian vegetation experience a continued upward trend, since livestock have been removed from the canyon bottoms. In the broadleaf riparian vegetation type, the range in good condition is estimated to increase 5 percent; in fair condition, decrease 15 percent; and in poor condition, increase 10 percent (table 2-28).

Creosotebush Type

The creosotebush vegetation type would remain as it is now with few exceptions, since it contains mostly unpalatable shrubby species. The palatable species present--four-wing saltbush, tobosa grass, black grama, and bush muhly--would decline in percent composition in 15 years as a result of excessive stocking rates. In infrequent years palatable annuals would continue to grow.

TABLE 2-28

ESTIMATED CHANGE IN RANGE CONDITION AFTER 15 YEARS OF EXISTING MANAGEMENT

Map Code (Map 2-7)	Vegetation Type	ESTIMATED PERCENT OF VEGETATION TYPES IN RANGE CONDITION CLASSES							
		EXCELLENT		GOOD		FAIR		POOR	
		Existing	Future	Existing	Future	Existing	Future	Existing	Future
A	Irrigated cropland other land use areas	---	---	---	---	---	---	---	---
1	Grassland	6	5	16	10	46	48	32	37
5	Mountain Shrub	11	8	47	38	23	28	19	26
8	Barren	0	0	0	0	0	0	100	100
9	Pinyon-Juniper	62	62	20	20	10	10	8	8
10	Broadleaf Riparian	0	0	0	5	71	56	29	39
11	Creosotebush	0	0	0	0	60	50	40	50
12	Mesquite	0	0	0	0	20	20	80	80
13	Saltbush	0	0	0	0	19	16	81	84
16	Desert Shrub	1	1	6	4	54	43	39	52
17	Half-Shrub	0	0	0	0	90	75	10	25

Areas where creosotebush constitutes 90-95 percent of the plant community would remain stable, in a fair range condition but in a poor livestock forage condition. Very little, if any, forage would be available for livestock. Ten percent of the creosotebush range would be estimated to change from fair to poor condition (table 2-28).

Mesquite Type

The mesquite type would remain as it is now, dominated by shrubby plant species of low palatability. Perennial grasses, which constitute a small part of the plant community, would survive only under the mesquite canopy,, where livestock cannot reach them. The mesquite type is generally in a stable condition, but it might increase slightly in acreage.

Saltbush Type

The saltbush type would expand slightly in acreage in 15 years. Most of the plant species in this type are of low palatability. The major exception is four-wing saltbush, which is scattered throughout most of the saltbush type and is the dominant saltbush species in a few locations. An increase in the number and size of gullies is the major change that would be evident. An estimated 4 percent of the saltbush range would change from fair to poor condition (table 2-28).

Desert Shrub Type

The desert shrub type would not appreciably change in size but would change in composition. Major grass species (sideoats grama, black grama, tobosa grass and bush muhly) would decrease in percent composition. Palatable shrubs (jojoba, four-wing saltbush) would continue to be overused, and reproduction would be low. Half-shrubs would take advantage of lowered perennial grass production and vigor and would increase in composition. The range condition of the desert shrub vegetation type would change as follows: good, decrease 2 percent; fair, decrease 11 percent; and poor, increase 13 percent (table 2-28).

Half-Shrub Type

The half-shrub type would increase in acreage at the expense of palatable perennial grasses. Wildlife is not expected to be a factor in controlling the increase of this half-shrub type. An estimated 15 percent of half-shrub range in fair condition would change to poor condition (table 2-28).

Animals

The continuation of present livestock grazing with existing stocking rates would have varying effects on the fauna. Figures 2-15 through 2-24 portray anticipated projections for important and representative species of wildlife. Certain species that prefer heavily used and deteriorated range would increase. Others not so adapted would decrease, whereas others would maintain their present status. Within this framework,

FIGURES 2-15-2-24

TREND ESTIMATES OF FISH AND WILDLIFE SPECIES BY VEGETATION TYPE WITHIN THE SAN SIMON GRAZING DISTRICT

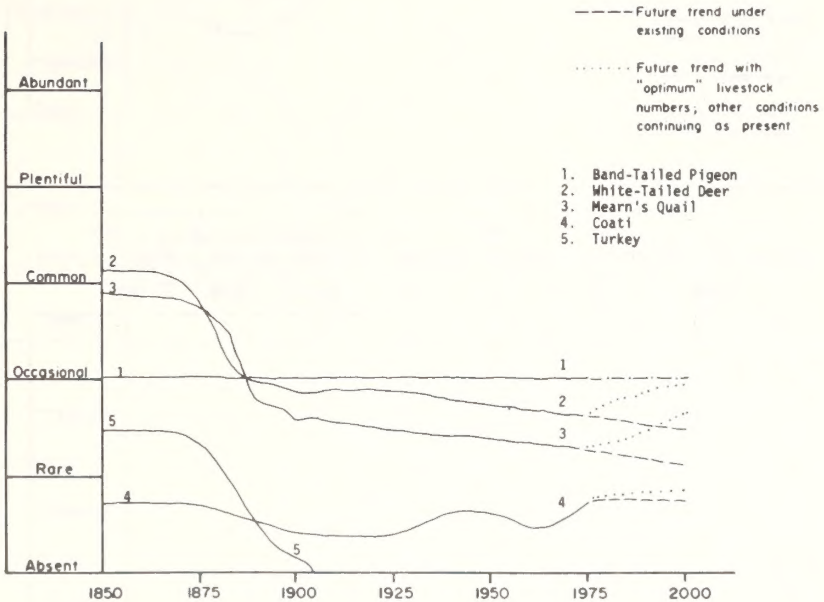


Figure 2-15 Trends of Relative Abundance of Some Madrean Evergreen Woodland Species of Wildlife in the San Simon Grazing District

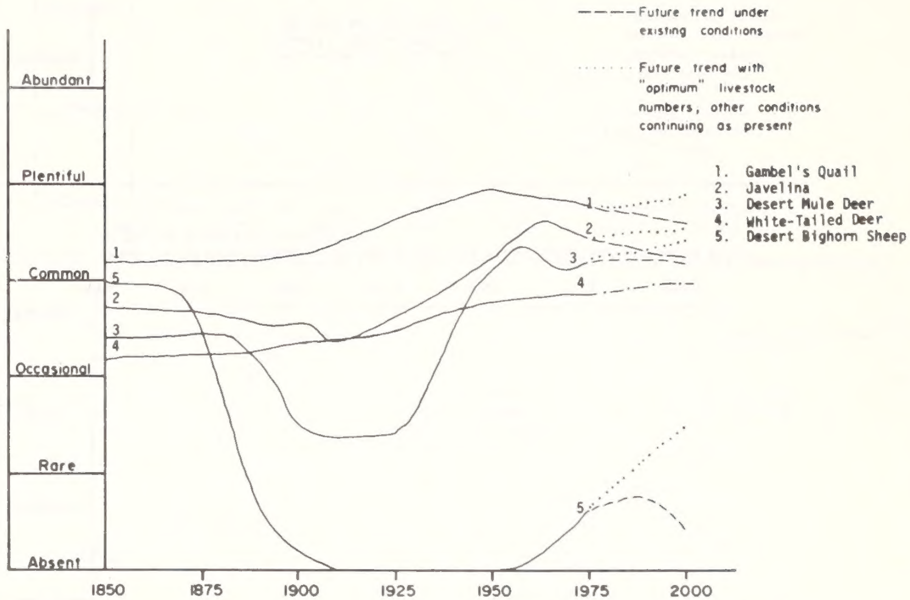


Figure 2-16 Trends of Relative Abundance of Some Desert Scrub and Chaparral Species of Wildlife in the San Simon Grazing District

Source: Arizona Game and Fish Department (1976c)

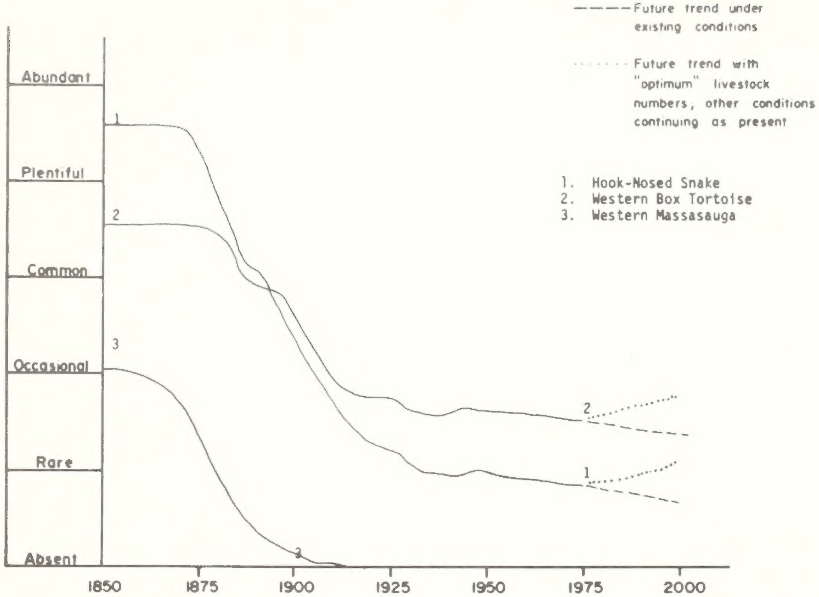


Figure 2-17 Trends of Relative Abundance of Some Plains and Desert Grassland Species of Reptiles in the San Simon Grazing District

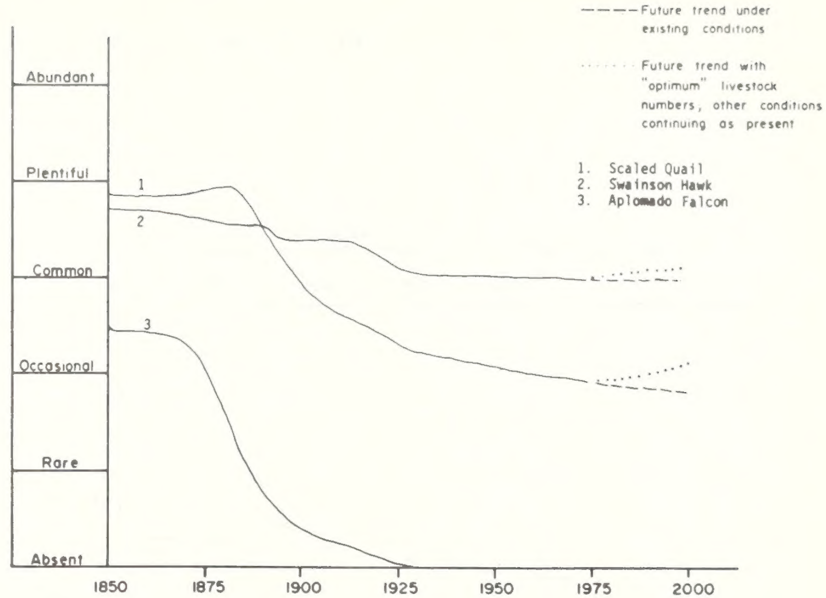


Figure 2-18 Trends of Relative Abundance of Some Plains and Desert Grassland Species of Birds in the San Simon Grazing District

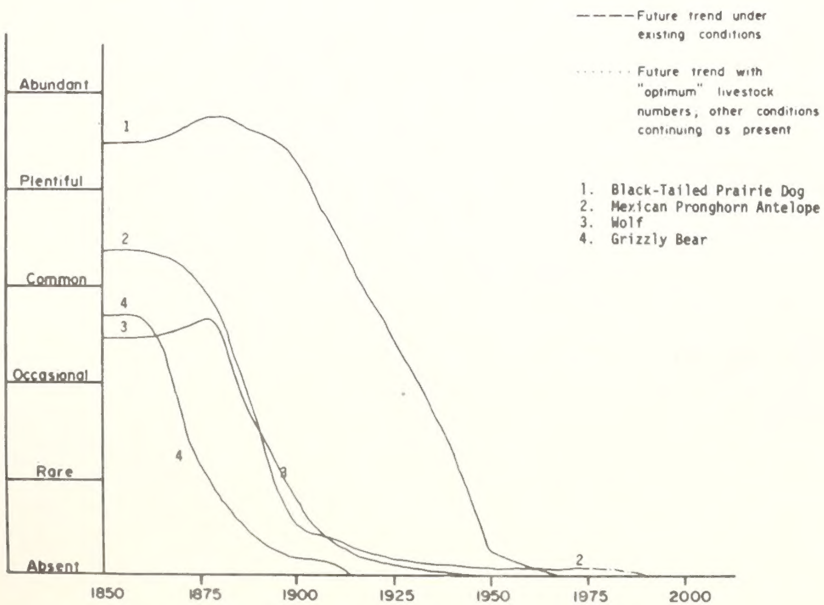


Figure 2-19 Trends of Relative Abundance of Some Plains and Desert Grassland Species of Mammals in the San Simon Grazing District

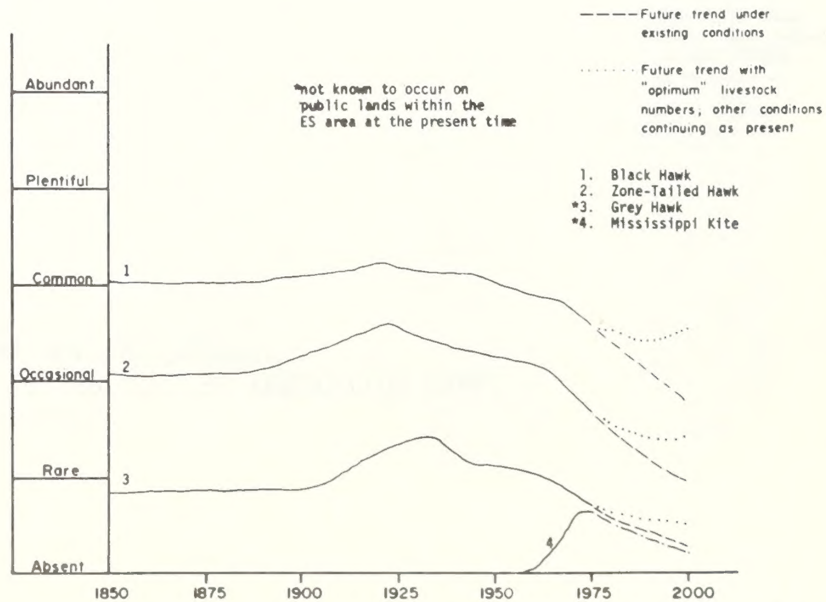


Figure 2-20 Trends of Relative Abundance of Some "Threatened" Riparian and Wetland Species of Raptors Breeding in the San Simon Grazing District

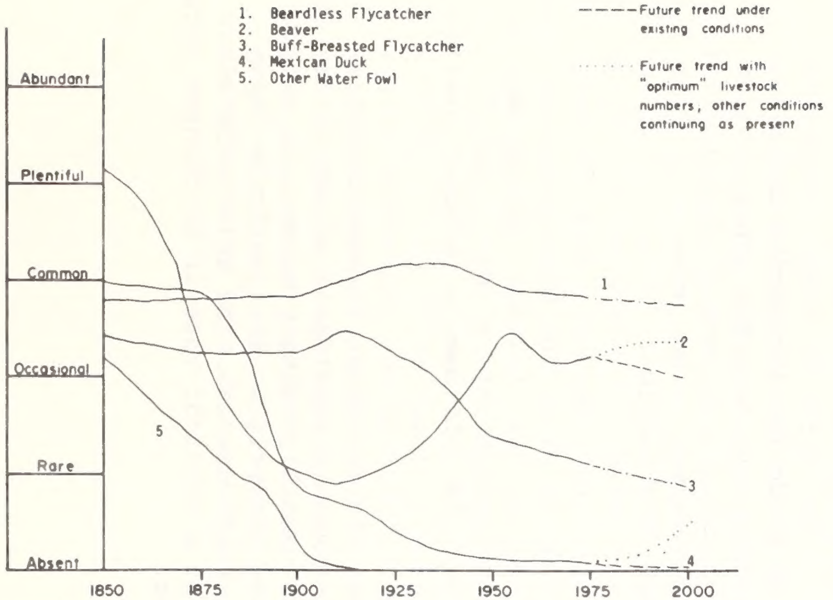


Figure 2-21 Trends of Relative Abundance of Some Riparian and Wetland-Associated Wildlife Species Breeding in the San Simon Grazing District

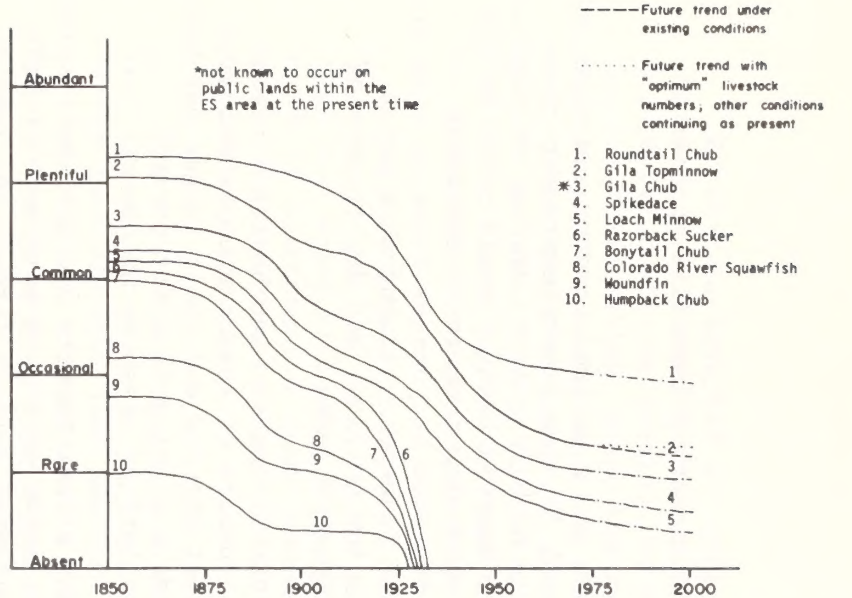


Figure 2-22 Trends of Relative Abundance of "Threatened" Native Fishes in the San Simon Grazing District

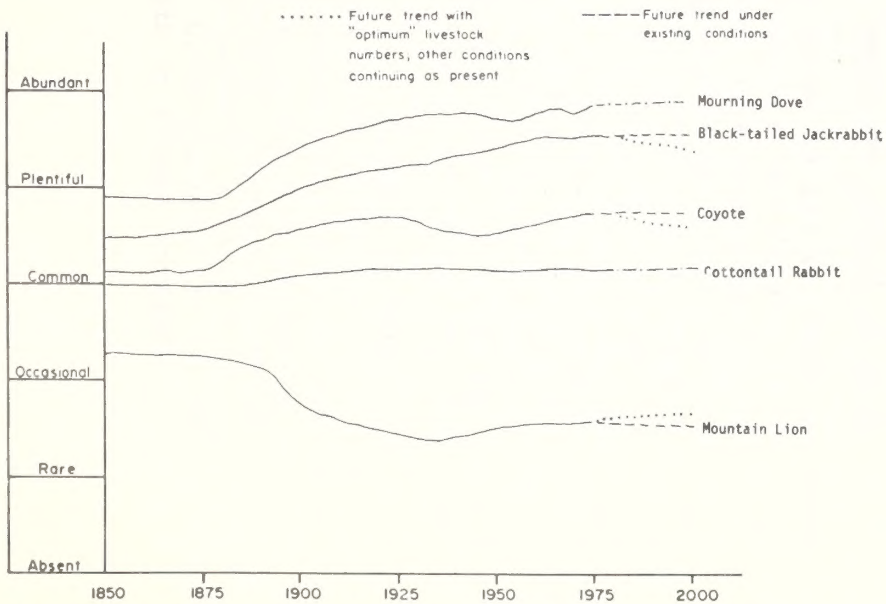


Figure 2-23 Trends of Relative Abundance of Some Influent Species of Wildlife in the San Simon Grazing District

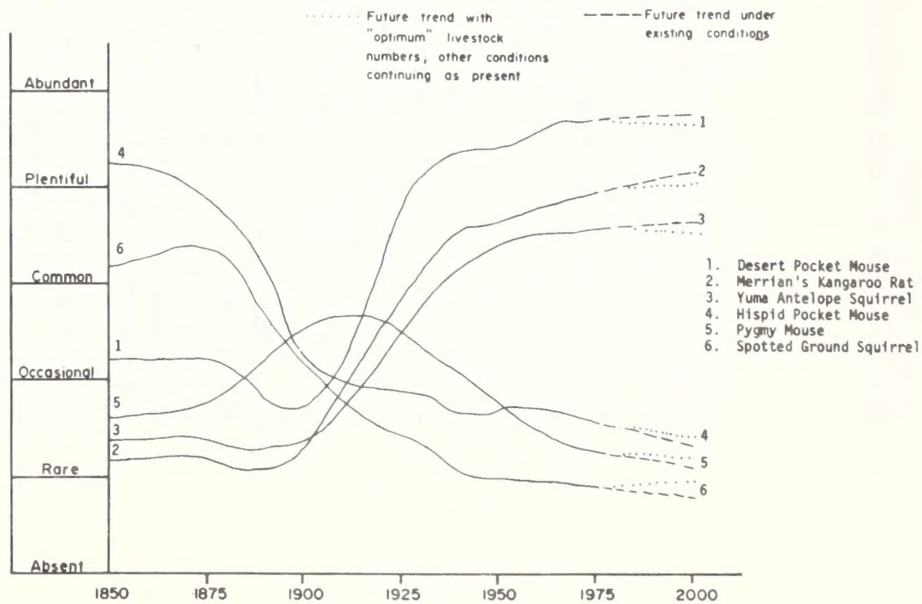


Figure 2-24 Trends of Relative Abundance of Some Influent Species of Small Mammals in the San Simon Grazing District

wildlife populations would cycle upward during favorable periods of rainfall and decline during drought.

Wildlife species associated with the grassland complex and riparian areas would be most affected. Overall changes from the present situation during the 15-year period would be difficult to discern throughout much of the area. The most readily observed changes would occur in the grazed creek and river bottoms. Already-low numbers of desirable mature riparian trees would not be replaced by younger trees as they are lost to the plant community. Present livestock grazing is a major avoidable cause of the modification, low quality, and destruction of wildlife habitat, particularly in riparian areas.

Data from the insect study described earlier in chapter 2 reveal little about future fluctuations in numbers of insect species and size of populations. The numbers of insect species and their ranges may have increased since the early days of heavy grazing, but the current direction of species numbers and populations sizes is unknown.

The only area whose change might affect insects are (1) the environments along streams, through deterioration of stream margins by cattle movement and (2) the drainages of untapped springs through the removal or reduction of water.

Natural History Resources

Paleontological Resources

Natural forces would continue to erode the lacustrine and diatomaceous sediments and gravel conglomerates, and this process would continue to be amplified by the accelerated water runoff resulting from poor range condition. Fossils would continue to be exposed and then broken, looted, displaced, and washed away and lost.

Geological Resources

Natural forces would also continue to erode the highly erosive Gila lakebed sediments found at the Red Knolls, Bear Springs, and North Whitlock Mountains sites, and the accelerated rate of water runoff resulting from poor range conditions would continue to increase erosion.

Cultural Resources

Cultural Resources in the Upper Gila San Simon ES area are on a downward trend, a trend expected to continue regardless of any action or inaction on the part of the BLM's livestock grazing program. Livestock grazing can impact cultural resources directly or indirectly in three ways: trampling, erosion, and range improvements. The relatively minor impact of trampling would continue at a constant rate if no changes occur in livestock numbers or distribution.

Erosion is expected to continue at an increasing rate if no action occurs in the livestock grazing program. Natural erosion and erosion caused indirectly by grazing, as well, should increase in areas such as the San Simon Valley, where the range condition is relatively poor. Greater erosion would increase the rate of site disturbances and increase destruction and the number of sites impacted. Natural weathering has had the greatest impact on historic sites and is expected to continue at the present rate. The combined trend for all cultural resources would be downward at an increasing rate.

The third type of impact resulting from cattle grazing--range improvements--would have little effect on cultural resources or their condition trend since few improvements would be constructed. Other types of construction would continue to impact cultural resources, but only slightly, due to surveys and mitigative measures being completed as required by law.

The most frequent and most damaging impact to the archaeological resources at present is digging by vandals. This impact would continue at the same alarming rate whether or not action is taken in the livestock grazing program. Vandals are expected to destroy up to 40 percent of the ES area's archaeological resources within 15 years.

The condition of the cultural resources 15 years from now cannot be predicted on a site-specific basis, since vandals are expected to have the greatest impact, and their behavior is random and unpredictable on a site-specific basis. General predictions, however, pertaining to regions and general types of sites can be made. Vandalism should increase at smaller and less spectacular sites due to a decrease in the availability of undug large sites with evidence of abundant remains. Damage at presently favored sites should therefore decrease. Vandalism may also increase in more remote areas because of increased site patrolling at the more accessible sites by BLM and law enforcement agencies. The impact of vandalism is expected to remain stable elsewhere and at other types of sites, including historic sites.

Aesthetics

The primary aesthetic characteristic of the ES area's landscape is its naturalistic mountains surrounding fairly broad valleys. Although farming, rural development, grazing, and mining have changed the area's visual resources, the quality of these resources should remain high during the next 15 years due to governmental efforts. Past modifications would remain in the future environment, but vegetation growth and weathering over time would probably lessen the initial impacts. The success of maintenance on range improvements would determine the degree to which features would intrude into the future environment.

Since most of the land within the ES area is under Federal and State control, the natural landscape should remain relatively free from encroachment. About 12 percent or 344,014 acres of the total land area is privately owned, providing an adequate land base for rural expansion without public pressure for the conversion of more Federal and State land for these purposes. Should plans to increase mining operations and construct additional transmission lines become a reality, such projects would lessen the quality of the visual resources.

Because outdoor recreation is important to the local economy, one can assume that county officials would probably develop adequate zoning to keep development in the valleys comparable with the area's high-quality visual resources.

Primitive Values

Grazing on a regular basis would continue to be prohibited within Aravaipa Canyon Primitive Area. Heavy grazing would probably continue to diminish the pristine and natural appearance of the proposed primitive and natural areas, especially in more accessible areas and around cattle-congregating areas such as water sources. Range improvements would continue to be built within proposed primitive and natural areas at a decelerated rate. Fencing would continue to restrict the movement and detract from the experience of primitive area users, and water would continue to be developed for livestock without facilities for human use.

Wilderness Values

If the proposed action is not adopted, the wilderness values would not be expected to change significantly.

Land Uses

Recreation

Livestock grazing and other land uses would continue to influence recreation resource values. Recreation resource quality would probably remain the same, but the effects of livestock grazing would allow little opportunity for improvements to meet the increasing demand for outdoor recreation.

Conflicts between livestock operators and recreation users would probably continue and would be evidenced by open gates, camping near water, cattle in unfenced recreation sites, the cutting of fence lines, trespassing, the scaring and chasing of livestock, and the shooting of livestock and facilities. The conflict would be most severe at intensive-use recreation sites: camping and picnicking sites, water sports areas, off-road vehicle areas, trailhead access points, and hunter conservation areas.

Although most people enjoy seeing livestock, they do not enjoy sharing the same immediate space with them. Fencing of developed recreation sites would continue to reduce the available acreage for livestock forage. Cattle would continue to graze unfenced on low-standard recreation sites, to trample the soil, to remove and break down some of the vegetation, to create trails, to stir up dust, and to defecate and attract flies.

Sediments in the Gila River would continue to cause high turbidity and reduce the quality of fishing and water sports. Overgrazing contributes to the sediment load and to high turbidity, which reduces fish populations and lengthens the time necessary for the turbidity to be reduced to a level where fishing is again possible. Along with reducing swimming and floatboating quality, high turbidity is a safety hazard. The reduced visibility hides danger spots in the water and complicates finding a drowning person. Extremely low flows would continue to limit floatboating opportunities and would require cross fencing of the Gila River, which is dangerous to floatboaters.

Hunting opportunities would remain lower than would be expected if the range were not overgrazed. Big-game hunting quality would continue to be limited by low game populations. Small-game hunting, especially for quail, would be affected by fluctuating populations from year to year. With the generally low big-game populations, hunters would continue to be restricted by a permit system. The number of hunters would be restricted as well as specific hunting areas. Success ratios for all hunting would probably remain lower than the optimum expected from rangeland in good to excellent condition.

The depleted appearance of most rangeland from the lack of vegetation and the evidence of erosion would continue as would degraded sightseeing recreation values. Sightings of wildlife and livestock would continue to be infrequent.

Dispersed recreation uses such as hiking, horseback riding, and off-road vehicle use, which require large open-space areas, would continue to be somewhat confined and restricted by existing fences and the development of some new fences.

Outdoor recreation use projections and estimated demands for facilities and opportunities were taken from the Arizona Statewide Comprehensive Outdoor Recreation Plan (Arizona Outdoor Recreation Coordination Commission, 1972). Visitor use projections for planning district V (containing the Winkelman planning unit of the Safford District) were not available. Outdoor recreation use in Arizona is projected to increase 32 percent from a level of 174 million participation days in 1970 to 256 million participation days in 1985.

The *Arizona Statewide Comprehensive Outdoor Recreation Plan* did not, however, determine outdoor recreation facility and acquisition needs for the major recreation uses in the ES area, which are hunting, fishing, rockhounding, floatboating, sightseeing, off-road vehicle use, and natural or primitive area needs. Those recreation facility and acquisition needs identified are depicted to illustrate the relative need for facilities and recreation opportunities in the ES area. Table 2-29 identifies the current 5-year needs, and table 2-30 identifies the projected needs and deficiencies by 1980 and 1985.

TABLE 2-29
OUTDOOR RECREATION ACQUISITION AND DEVELOPMENT NEEDS
1974-1978

Planning District V		
Camp Units	537	
Picnic Units	1,466	
Boat Ramps	20	lanes
Trail Improvements	50	miles
Swimming Pools	5	
Golf Courses	18	holes
Tennis Courts	10	
Multiple-Use Courts	25	

Planning District VI		
Camp Units	390	
Picnic Units	110	
Boat Ramps	5	lanes
Beach Developments	1,400	linear feet
Swimming Pools	5	
Golf Courses	18	holes
Tennis Courts	5	
Multiple-Use Courts	20	

Source: Arizona Outdoor Recreation Coordinating Commission, 1972.

TABLE 2-30
OUTDOOR RECREATION FACILITY REQUIREMENTS AND DEFICIENCIES

Planning District V

	Deficiencies 1980	Programmed To 1980	Net Deficiencies 1980	New Needs 1980-1985	Deficiencies 1985	Programmed To 1985	Net Deficiencies 1985
Boat Ramp Lanes	42	25	17	1	18	18	---
Swimming Pool	13	6	7	1	8	6	2
Camp Spaces	608	608	---	66	66	66	---
Tennis Courts	16	13	3	2	5	5	---
Multiple-Use Courts	141	31	110	8	118	12	106
18-Hole Golf Courses	7	1	6	---	6	1	5
Picnic Units	512	512	---	37	37	37	---
Trails/Miles	---	50	---	---	---	50	---

Planning District VI

	Deficiencies 1980	Programmed To 1980	Net Deficiencies 1980	New Needs 1980-1985	Deficiencies 1985	Programmed To 1985	Net Deficiencies 1985
Swimming Beach/ Linear Feet	---	1,600	---	---	---	2,000	---
Boat Ramp Lanes	20	6	14	2	16	6	10
Swimming Pools	13	6	7	2	9	6	3
Camp Spaces	675	488	187	81	268	268	---
Tennis Courts	---	5	---	4	4	4	---
Multiple-Use Courts	160	25	135	16	151	24	127
18-Hole Golf Courses	3	1	2	---	2	1	1
Picnic Units	130	130	---	58	58	58	---

Source: Arizona Outdoor Recreation Coordinating Commission, 1972.

Livestock Grazing

If the proposed action is not adopted adverse effects on vegetation may be expected. These adverse effects would decrease the grazing capacity of the ES area, and, during the next 15 years, forage available to livestock would be expected to decline. In the vegetation section of this chapter, recent range surveys (1964-1976) when compared to the 1936 range survey showed a decrease in the carrying capacity of 42 percent or an average of 1.2 percent per year. If this rate of decrease continues, the forage production in the ES area would decrease by 20,675 AUMs in 15 years. Applications for grazing licenses might not, however, reflect this decline. With the current BLM grazing fees, some licensees would pay for livestock not actually grazed on the range in order to maintain the potential selling price of their allotments. Such a practice would inflate the value of licensed AUMs as compared to actual AUMs.

Licensed use in the future would remain about the same as in the present. If the actual use remains the same in relation to licensed use, cattle would overgraze the vegetation on the range. This overgrazing would prevent cattle from fulfilling their dietary requirements from the range. Mature cattle would lose weight and some of their capacity for reproduction. Overuse of vegetation would eventually result in reduced calf crops, reduced weight of weaned calves, and increased mortality of both mature and young cattle (Stoddard and Smith, 1955). Licensees would ultimately lose money by overstocking the range, and this loss of revenue would probably force some licensees to sell their allotments.

Irrigated Cropland and Other Land Use Areas

If the proposed action is not adopted, agricultural and urban lands would neither affect livestock grazing nor be affected by it. The agricultural industry in the ES area is neither geared to nor dependent on the range livestock industry.

Vegetation Products

In the foreseeable future little change is expected in the production of vegetation products if the proposed action is not adopted, although some plants such as mesquite and cactus might increase in numbers.

Economic and Social Conditions

The following population, employment, and income forecasts for Cochise, Graham, and Greenlee Counties are based on the Economic Demographic Projection Model, Arizona Office of Economic Planning, Research Division (1976). The projected populations of the three counties follow.

PROJECTED POPULATION

	1980	1985	1990
Cochise	78,730	80,281	81,436
Graham	19,800	20,700	21,894
Greenlee	12,789	12,573	12,152

From 1975 to 1990 the populations of Cochise and Graham Counties are projected to increase at a rate of 0.6 percent per year and that of Greenlee County at a rate of 0.1 percent per year.

Table 2-31 shows projected employment for Cochise, Graham and Greenlee Counties. Mining is projected to continue to employ 50 percent of the workers in Greenlee County. A small decline is projected for agricultural employment in all counties.

Projected unemployment rates are shown below.

PERCENT UNEMPLOYMENT

	1980	1985	1990
Arizona	6.4	5.8	5.6
Cochise County	7.1	7.1	6.9
Graham County	10.9	10.4	8.8
Greenlee County	6.3	6.8	6.8

Projected total personal income for Cochise, Graham, and Greenlee Counties appear in the following table.

PROJECTED INCOME (1973 DOLLARS)

	1980	1985	1990
Cochise County	323,962,700	346,985,200	375,093,000
Graham County	70,555,700	80,420,300	91,934,900
Greenlee County	47,306,900	45,863,700	43,965,700

TABLE 2-31
EMPLOYMENT PROJECTIONS BY SECTOR FOR COCHISE, GRAHAM, AND GREENLEE COUNTIES

Sector	Cochise County			Graham County			Greenlee County		
	1980	1985	1990	1980	1985	1990	1980	1985	1990
Agriculture	1,258	1,193	1,133	545	515	487	94	89	84
	5.4%	4.8%	4.2%	9.9%	8.4%	7.0%	1.8%	1.7%	1.6%
Mining	650	650	650	50	50	50	2,625	2,625	2,625
	2.8%	2.6%	2.4%	0.9%	0.8%	0.7%	48.7%	49.7%	11.7%
Construction	1,136	990	1,178	233	299	376	626	616	604
	4.9%	4.0%	4.4%	4.2%	4.8%	5.4%	11.6%	11.7%	11.7%
Manufacturing	1,570	1,625	1,625	250	250	250	450	450	450
	6.7%	6.5%	6.1%	4.5%	4.1%	3.6%	8.3%	8.5%	8.7%
T.C.P.U. 1/	1,372	1,762	1,872	183	222	267	90	85	77
	5.9%	7.1%	7.0%	3.3%	3.6%	3.9%	1.7%	1.6%	1.5%
Trade	4,182	4,950	5,087	1,127	1,301	1,505	418	393	359
	17.9%	18.4%	19.0%	20.5%	21.1%	21.7%	7.8%	7.4%	7.0%
F.I.R.E. 2/	542	645	772	139	183	235	43	36	28
	2.3%	2.6%	2.9%	2.5%	3.0%	3.4%	0.8%	0.7%	0.5%
Services	2,521	2,867	3,288	654	802	975	159	137	108
	10.8%	11.5%	12.3%	11.9%	13.0%	14.1%	2.9%	2.6%	2.1%
Government	7,800	8,147	8,572	1,704	1,853	2,027	533	512	483
	33.5%	32.7%	32.0%	30.9%	30.1%	29.3%	9.9%	9.7%	9.4%
Other Non-Agricultural	2,289	2,427	2,596	626	686	755	348	339	328
	9.8%	9.8%	9.7%	11.4%	11.1%	10.9%	6.5%	6.4%	6.4%
Total Adjusted Employment 3/	23,437	25,021	26,907	6,343	7,190	8,083	4,896	4,801	4,678

1/ Transportation, communication, and other public utilities. 2/ Finance, insurance, and real estate.
3/ Sum of sectors does not equal total adjusted employment because sector figures represent number of jobs held whereas total adjusted employment represents number of people employed.

Source: Arizona Office of Economic Planning and Development, Research Division, 1976.

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CHAPTER 3

ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

CHAPTER 3

ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

Chapter 3 identifies and analyzes the adverse and beneficial impacts expected to result from the proposed action. For some of the environmental elements discussed in chapter 2, no significant impacts are anticipated. Thus, chapter 3 does not discuss or discusses only briefly climate and air quality, topography, geology, agriculture, mineral resources, and vegetation products.

The following assumptions have been made as a basis for the impact analysis:

1. BLM will have the capabilities and resources to implement the AMPs and manage the grazing units.
2. Construction stipulations incorporated in the proposal will be effectively carried out.
3. Impact assumptions will be verified and monitored by the proposal implementation and monitoring procedures listed in chapter 1.
4. Livestock and wildlife will utilize no more than 60 percent of the available forage in any one pasture.
5. Long-term impacts will be assessed using as baseline data the resource levels in the "Future Environment" section of chapter 2.
6. The proposed range improvements will temporarily disturb approximately 739 acres and permanently disturb approximately 362 acres.
7. The proposed range improvements will cost approximately $4,212,100 (1976 dollars) to construct and $25,536 a year to maintain.

CLIMATE AND AIR QUALITY

The proposed action would have no discernable impact on the ES area's climate. It would have a minor beneficial impact on the ES area's air quality, since the anticipated increase in ground cover is expected to decrease soil erosion and thus windblown particulate matter.

SOILS

Summary

The proposed action would beneficially impact the soils of the ES area. The reduction of livestock numbers by an average of 33 percent and the increased ground cover (litter accumulation and vegetation) (see table 3-2) would reduce soil movement, reduce raindrop impact, and decrease compaction, thus increasing the infiltration rate. The proposed action would have the long-term benefit of reducing sediment yield by 838 acre-feet per year or 36 percent, or 178 acre-feet per year from grazing management and 660 acre-feet per year from detention dams. The reduction in sediment yield would result from both livestock management and the proposed water control structures.

Changes in sediment yield would reflect the grazing system used. Reductions in sediment yield are not expected on all grazing units with the implementation of the proposed action. Generally, sediment yield is projected to increase on grazing units under custodial management, where only small acreages of public lands are involved. On the other hand, sediment yield would be expected to decrease on grazing units managed for ephemeral grazing.

The construction of the Barrier, Tanque, and Slick Rock detention dams would highly benefit the San Simon drainage basin, effectively reducing the amount of sediment lost each year. These structures are designed to reduce sediment loss by a maximum of 660 acre-feet per year. An anticipated 30 miles of eroded San Simon River channel would be filled by sediment at an average rate of 0.85 miles per year. Further information and specifications on these detentions dams are on file in the Safford District office.

Specific

The proposed reduction in livestock numbers would benefit soil resources with or without a livestock management system. The reduction in livestock would reduce the average grazing of vegetation and allow an increase in ground cover that would decrease sediment yield.

Sediment yield would decrease on 118 grazing units (1,199,124 acres), increase on 34 grazing units (187.067 acres), and remain the same on 41 grazing units (159,871 acres). Table 3-1 reveals present and anticipated sediment yield by range management type. See appendix A for the methodology for determining sediment yield.

TABLE 3-1
SEDIMENT YIELD BY RANGE MANAGEMENT TYPE
(IN ACRE-FEET PER YEAR)

Management Type	Acres	Percent of Area*	Present Sediment Yield	Projected Sediment Yield (15 years)	Change in Sediment Yield	Percent Change
Intensive	1,684,007	72	1,766	1,608	-158	-9
Custodial	256,022	11	244	248	+4	+2
Ephemeral	371,969	16	297	274	-23	-8
Unallotted	34,064	1	23	22	-1	-5
Total	2,346,062*	100	2,330	2,152	-178	-7.7

*Total number of acres included in BLM grazing units.

Sediment yield on ephemeral grazing units is expected to decrease as a result of a decrease in grazing. Theoretically, sediment yield could be reduced the most on ephemeral grazing units, since perennial plant utilization would be very low. The potential increase in perennial plant cover on the majority of these ephemeral units, however, would be low because the soil inherently lacks potential for high vegetation production.

A 9 percent overall decrease in sediment yield is expected on intensively managed grazing units. This decrease would be achieved mainly through an increase in ground cover, which would decrease soil erosion. Intensive managment systems would cover 72 percent of the ES area under BLM administration. Sediment yield on custodial grazing units would generally increase or remain unchanged. The construction of the three detention dams would highly benefit the San Simon watershed by reducing the amount of sediments moving into the Gila River from the San Simon watershed.

The proposed action would also benefit problem-area soils identified in chapter 2. Approximately 90 percent of the area identified as in a critical or severe erosion condition class is proposed for either deferment of grazing or ephemeral management. These two management systems would allow natural revegetation, thus lowering the erosion condition class.

ENVIRONMENTAL IMPACTS

Range Improvements

The following table shows the acres that would be temporarily and permanently disturbed by the construction projects of the proposed action.

PROJECT TYPE	ACRES DISTURBED TEMPORARY	ACRES DISTURBED PERMANENT
Range improvements (excluding roads, trails, and detention dams)	414	87
Roads and trails	225	225
Detention dams	100	50
Total	739	362

Construction of the three detention dams would disturb 100 acres, but part of this impact would be short term, since the recovery of the ground cover and soil would require approximately 3 to 10 years, depending upon climatic conditions. The dams would permanently disturb 50 acres.

The other proposed projects would temporarily disturb 639 acres and would also require a 3 to 10-year period for recovery. All projects would permanently occupy approximately 362 acres.

During the construction and recovery period, soil erosion would increase due to compaction and the removal of ground cover. During and immediately following construction, sediment yield would increase from 0.52 acre-feet per year to approximately 2.5 acre-feet per year. After construction, however, sediment yield would decline each year as ground cover increases. The short- and long-term impacts (increased sediment yield and decreased ground cover), however, would be insignificant when compared to the total sediment production of the ES area.

WATER

Surface Water

Water Quantity

The construction of the Barrier, Tanque, and Slick Rock detention dams, the decreased grazing, and the subsequent increase in ground cover is expected to slightly decrease the volume of water entering the Gila River, although no quantitative estimates have been made of the amount of reduction.

Water Quality

The implementation of the proposed action would improve the water quality of the ES area. An anticipated reduction in sediment yield of 178 acre-feet per year with the implementation of intensive grazing management would decrease the amount of suspended solids in the Gila River. This reduction would have a low beneficial impact since these 178 acre-feet represent sediment moved and not necessarily that entering the Gila or its tributaries. Data are not available to determine the amount of moved sediment eventually delivered downstream in a major drainage.

The proposed Barrier, Tanque, and Slick Rock dams would have a high beneficial impact on the water quality of the Gila River. They are designed to entrap almost all of the 660 acre-feet per year of sediment that normally flow from the San Simon River into the Gila River. The San Simon River contributes an estimated 3 percent of the water but 26 percent of the sediment that enters the San Carlos Reservoir each year. These structures would entrap almost all the sediment from the San Simon River but allow the water to flow to the Gila, thus improving the Gila's water quality and greatly reducing the sediment entering the San Carlos Reservoir.

Groundwater

Minor beneficial impacts might result from the proposed action. The anticipated increase in vegetation cover might improve infiltration rates locally and increase ground water supplies in some areas.

VEGETATION

Summary

Overall, the proposed action is expected to benefit vegetation. The proposed average 40 percent use of the current year's growth would allow vegetation to recover vigor, reproduce, and increase in density. Range condition is expected to improve and in 15 years result in an increase of 14,237 AUMs for wildlife and livestock. Ground cover would increase by an average of 50 percent.

General

The expected benefit to vegetation would be accrued through the integral proposals of the action, including: (1) adjusting stocking rates by an average decrease of 33 percent to match carrying capacities in the ES area; (2) implementing grazing systems designed to satisfy the physiological needs of the vegetation resources; and (3) constructing range improvements to aid in livestock management through improving livestock distribution and control.

In general, livestock grazing affects vegetation in several ways: (1) depleting plant carbohydrate reserves, (2) reducing photosynthetic tissue in the plant needed to produce carbohydrates, and thus (3) preventing plant reproduction; (4) compacting soil (especially on wet soil), which may limit water infiltration and root growth; and (5) trampling, which physically damages plants, (Stoddart and Smith, 1955).

The ES area usually has two growing seasons: (1) early spring at green up (when plants start to turn green at their bases) but less than 10 percent of the total production occurs and (2) summer, when growth begins after the foresummer drought. The summer season is usually responsible for 90 percent of the forage produced.

Early spring grazing is most critical to plant physiology. Forage removal during this period is harmful because, for plants to grow new shoots to replace vegetation grazed, they must remove carbohydrates stored in their roots. Continually removing this new growth weakens a plant and eventually kills it. Continual and close grazing may not allow adequate photosynthetic tissue to remain in the plant to produce carbohydrates. Closely grazed plants cannot produce enough carbohydrates for storage; such food reserves are necessary for the initiation of growth the following year.

Another major impact occurs when plants are grazed at such a frequency or intensity as to limit reproduction or reduce the number of seeds produced. Grazing of many shrubs encourages lateral bud development and stimulates greater productivity. But twig growth is stimulated at the expense of flower and fruit production (Stoddart and Smith, 1955). Heavy grazing of grasses may not only remove all the seed produced by healthy plants but may also prohibit seed formation. Seed formation requires large quantitities of food reserves. If the food reserves do not exist, few, if any, seeds will be produced.

Soil compaction and trampling also affect vegetation, although such impacts generally are minor in the ES area. Soil compaction occurs primarily when the ground is wet and is a greater problem on finer textured soils that stay moist for longer periods of time. Compacted soils interfere with proper root development and retard water infiltration. Trampling physically destroys the plant and interferes with its life processes.

Livestock grazing may also beneficially impact vegetation. Animals may (1) loosen the surface of dry soil and aid water infiltration; (2) cover seeds that have accumulated on the soil surface; (3) loosen the hard seed coat of some seeds by passing the seeds through their digestive systems and thus allowing them to germinate; or (4) loosen and transport seeds to areas suitable for germination. In addition, grazing certain plants will cause them to branch out and become more bushy and produce more total herbage (Stoddart and Smith, 1955).

In fact, Stoddart, Smith, and Box (1975) reported that "There are instances in which total protection of range from livestock has failed to result in an expected revival of the vegetation, presumably because of the lack of animal action in aiding reproduction." Research seems to indicate that properly grazed plants are as productive as ungrazed ones, or even more productive (Stoddart and Smith, 1955).

Determining the importance of the possible beneficial impacts of livestock grazing on vegetation, however, is difficult. Research data are abundant for the identification of adverse impacts but seem to be sparse for the identification of beneficial impacts.

Specific

Table 3-2 shows the possible short-term and long-term impacts on vegetation for each proposed grazing system. In any of these systems the most important consideration is to have the proper number of livestock graze a particular portion of rangeland. No system can substitute for the proper carrying capacity. The proposed action includes proper livestock use on a particular grazing unit. Refer to appendix B for specific information concerning each grazing unit.

Under the proposed action, utilization of perennial grasses over a period of years would average about 40 percent. Utilization, however, could range from as low as 20 percent in years of high forage production (e.g. favorable climatic years) to as high as 60 percent in years of low forage production. In general, about half of the perennial grass plants would be grazed and about half would remain ungrazed in the average year. During the first year of the implementation of rest rotation and the Santa Rita three-pasture rotation systems no carryover forage would be available on ranges previously grazed yearlong. If the climate is unfavorable during this initial year, vegetation and consequently animal life could suffer.

Rest-Rotation Grazing

Prescribed grazing treatments allow opportunities for (1) plants to make and store food for vigor, (2) seeds to ripen, (3) seedlings to become established, and (4) litter to accumulate between the plants (see grazing formula in chapter 1).

Santa Rita Three-Pasture Rotation

The Santa Rita three-pasture rotation system allows for rest during the critical spring and early summer growing periods as well as during early fall, 2 years out of 3. This system allows carbohydrate reserves to be built up and seedlings to become established. Winter grazing between the two March-October rest periods helps trample seeds. The

TABLE 3-2

IMPACTS OF THE PROPOSED GRAZING SYSTEMS ON VEGETATION

Grazing System & No. of Grazing Units Under System*	Acreage Public Lands	Acreage Other	Cause of Impact	Length of Impact**	IMPACTS
REST-ROTATION 13 grazing units 19% of ES Area	334,142	111,720	A) Graze 1 pasture yearlong. 20-60% of forage utilized.	ST	Plant vigor, reproduction, and litter accumulation reduced.
			B) Rest 1 pasture yearlong.	ST	Plant vigor restored; litter accumulation increased.
			C) Rest 1 pasture until seed-ripe (approx. Oct. 1-15). Then graze until end of February. Utilize 20-60% of forage.	ST	Plant vigor, reproduction, and seed trampling increased.
			D) Rest 1 pasture yearlong.	ST	Plant vigor, reproduction, seedling establishment increased.
			Total Grazing Units	LT	Increase ground cover from an average of 12% to an average of 17%. Improve range condition and increase vegetal production.
SANTA RITA THREE-PASTURE ROTATION 25 grazing units 20% of ES Area	279,575	197,261	A) Graze 1 pasture March through October. Utilize 20-60% of forage.	ST	Plant vigor, litter, reproduction and seedling establishment reduced.
			B) Rest 1 pasture until November. Graze through February. Utilize 20-60% of forage.	ST	Plant vigor and reproduction increased. Seedling establishment and litter reduced.
			C) Rest 1 pasture yearlong.	ST	Plant vigor, reproduction, litter accumulation, and seedling establishment increased.
			Total Grazing Units	LT	Increase ground cover on all grazing units from an average of 10% to an average of 16%. Improve range condition and increase vegetal production.
DEFERRED ROTATION 8 grazing units 6% of ES Area	89,973	57,275	A) Graze March through October. Rest November through February. Utilize 20-60% of forage.	ST	Plant vigor, litter seedling establishment, and reproduction reduced.
			B) Rest March through October. Graze November through February. Utilize 20-60% of forage.	ST	Plant vigor, litter, reproduction, and seedling establishment increased.
			Total Grazing Units	LT	Maintain ground cover on some grazing units. Increase ground cover on others from an average of 15% to an average of 20%.
YEARLONG 24 grazing units 18% of ES Area	237,907	189,304	A) Graze yearlong. Utilize 20-60% of forage	ST	Reduced plant vigor, reproduction, seedling establishment, and litter accumulation near permanent waters and livestock concentration areas.
			Total for Grazing Units	LT	Increase ground cover, litter accumulation, seedling establishment, and plant vigor. Increase ground cover from an average of 13% to an average of 17% except in areas where livestock concentrate.
SEASONAL 17 grazing units (several grazing formulas) 8% of ES Area	98,732	77,418			
A. Summer Seasonal			A) Rest March through May.	ST	Increase plant vigor.
			B) Graze June through August. Utilize 20-60% of forage.	ST	Decrease reproduction, litter accumulation, and seedling establishment.
			C) Rest September through February.	ST	Increase plant vigor, reproduction, and litter accumulation.
			Total Grazing Units (above formula)	LT	Increase ground cover from 12% to 14%. Slightly improve range condition and increase vegetal production.
B. WINTER SEASONAL			A) Graze October through March. Utilize 20-60% of forage.	ST	Increase seed trampling and reproduction of warm-season grasses. Decrease plant vigor of cool-season plants.
			B) Rest April through September	ST	Increase plant vigor warm-season plants.
			Total Grazing Units	LT	Increase ground cover from an average of 15% to 20%. Improve range condition and increase vegetal production.
C. WINTER SEASONAL ROTATION			A) Graze October through March. Utilize 20-60% of forage.	ST	Increase seed trampling.
			B) Rest April through September.	ST	Increase plant vigor, reproduction, litter accumulation.
			C) Repeat following year.	ST	Same impacts as above.
			D) Rest entire grazing unit for third year.	ST	Increase plant vigor, reproduction, litter accumulation, seedling establishment.
			Total Grazing Units	LT	Increase plant vigor, seedling establishment, litter accumulation, reproduction. Increase vegetal production and improve range condition. Increase ground cover from an average of 13% to 18%.
CUSTODIAL 33 grazing units 11% of ES Area	38,161	217,861	Graze yearlong.	ST	Reduce plant vigor, reproduction, seedling establishment, and litter accumulation in areas accessible to grazing (e.g. watering areas).
			Total Grazing Units	LT	Reduce plant vigor, reproduction, seedling establishment, and litter accumulation. At best maintain current range condition and vegetal production. Some grazing units would experience lowered range condition and reduced vegetal production.
EPHEMERAL 65 grazing units 16% of ES Area	250,155	116,914	A) Grazing whenever annual forage is abundant. (Usually not more than 2 years out of 5 for less than 3 months).	ST	Reduce plant vigor, reproduction, and litter accumulation of annual grasses.
			B) Rest Yearlong--when not used as above.	ST	Increase plant vigor, reproduction, seedling establishment, and litter accumulation.
			Total Grazing Units	LT	Increase plant vigor, reproduction, seedling establishment, and litter accumulation. Improve range condition and density of perennial forage plants.
DEFERMENT OF GRAZING USE 1% of ES Area	14,050	1,550	A) Rest Yearlong.	ST & LT	Increase plant vigor, reproduction, seedling establishment, litter accumulation. Improve range condition and increase vegetal production.
UNALLOCATION OF GRAZING USE 1% of ES Area	4,014	30,050	Rest Yearlong	ST & LT	Same as above.

*See appendix B for specific grazing unit names and numbers. **ST--Short-term impacts on vegetation would occur immediately after a proposal is implemented on a grazing unit and would last 1 to 2 years after each grazing treatment is applied. LT--Long-term impacts would begin to occur within 20 years after implementation of the proposed action and would remain in effect as long as the grazing system is maintained.

winter rest provides carryover forage (ungrazed forage produced during the previous year) for the spring and reduces wildlife-livestock competition for shrub species in the winter (see grazing formula in chapter 1). This system has been used experimentally on the U.S. Forest Service Santa Rita Experimental Range near Tucson, where the climate is similar to that of the ES area.

Deferred Rotation Grazing

Studies conducted on the Santa Rita Experimental Range have shown that deferred rotation grazing systems are not generally better than yearlong grazing as measured by grass density changes or total herbage production (Martin, 1973). Under deferred rotation grazing, impacts on vegetation are expected to be similar to those mentioned under yearlong grazing. Increased herbage production and plant density are expected to occur but not as rapidly as under the Santa Rita three-pasture rotation or rest-rotation system.

Yearlong Grazing

Yearlong grazing is the traditional grazing system of semidesert ranges. Under yearlong grazing conservative stocking rates have been shown to produce increases in the density of perennial grasses (Martin, 1973). This increase, however, is slower than that occurring under the Santa Rita three-pasture rotation system.

The major impacts resulting from yearlong grazing are (1) excessive vegetation utilization in areas of cattle concentration, (2) low or no utilization of forage in areas where cattle rarely graze, and (3) grazing too closely of cool-season grasses and palatable shrubs. Under this system cattle graze green plants too closely in the early spring, depleting plant carbohydrate supplies (Martin, 1975). Yearlong grazing almost invariably results in excessive utilization of the most palatable forage species in a given pasture.

The major advantages of yearlong grazing are not related to the vegetation resource but to animal husbandry. Under yearlong grazing livestock do not have to adjust to new areas with different vegetation and topography. Moreover, yearlong grazing involves less labor in raising livestock (Martin, 1975).

Seasonal Grazing (Summer)

Under the summer seasonal grazing system, impacts on vegetation would be minimal, since animals would use the grazing unit only 25 percent of the time while 90 percent of the forage is being produced. A problem, however, would result from preferred parts of the pasture and preferred plants being grazed first each summer.

Plants would not be grazed during the critical early spring when food reserves are low. Cool-season grasses and shrubs should benefit from this system, but any improvement in warm-season grasses would probably be slow. Some impacts would result from livestock trampling the green forage produced.

Seasonal Grazing (Winter)

According to the Arizona Inter-Agency Range Committee 1972 (1973), grazing during the winter has little direct effect on warm-season grasses. Cool-season grasses and palatable shrubs, however, may suffer if utilization is excessive. Grazing during winter on shrubs can reduce flowering and seed production and thus reduce reproduction (Stoddart and Smith, 1955). Livestock trampling would have little impact except possibly a minimal impact on young shrubs and cool-season grasses.

Winter Seasonal Rotation System

The winter seasonal rotation system would benefit warm-season grasses and moderately benefit cool-season grasses and shrubs. This system would allow grazing during the critical early spring period, but would provide rest for 1 or 2 years out of 3 (see grazing formula in chapter 1). Trampling impacts would be limited to those expected on cool-season grasses and shrubs under the winter seasonal system.

This system would benefit warm-season grasses by providing for seed covering by livestock trampling. Similar systems have experimentally improved vegetation at the Santa Rita Experimental Range.

Custodial Grazing Management

Impacts associated with the custodial management system are similar to those expected under yearlong grazing. The impacts, however, might be greater than those under yearlong grazing. In many instances BLM would not regulate the total number of livestock on a custodial management grazing units because these small, scattered tracts of public lands would be intermingled and used with private rangelands. In these cases the rancher would be licensed to use the production from the public lands.

Ephemeral Grazing Management

Most frequently, livestock grazing would be allowed on ephemeral management units during the summer growing season. Summer rains can produce an abundance of annual grasses and forbs, and grazing during this period would result in few impacts, the greatest of which would probably be soil compaction.

Perennial grass and shrub species produce most of their volume during the summer growing season, but under ephemeral grazing they would be lightly used because of the abundance of annual forbs and grasses. On grazing units classified as ephemeral, four-wing saltbush (*Atriplex canescens*) is commonly the only palatable shrub, which grazing should not adversely affect because an ephemeral bloom produces an abundance of palatable annual grasses and forbs. Since annual production sufficient for emphemeral grazing does not occur every year, ephemeral areas would not be grazed every year. Therefore impacts would be minimized.

Occasionally winter precipitation would be adequate to produce cool-season annual grasses and forbs, and ephemeral grazing would occur during the early spring, when grazing can be most harmful to warm-season perennial grasses and shrubs. Wet springs, however, are infrequent (usually less than 3 years in 10), and grazing would not occur each year during this critical growth period. Overall, the impacts of such grazing would be minimal.

Deferment of Grazing

Livestock grazing would not be allowed in the critical watershed areas along the San Simon River until the areas are rehabilitated and revegetated (approximately 15 to 25 years). Thus no impacts to vegetation are expected to result from livestock grazing.

The proposed deferment of livestock from riparian areas would highly benefit vegetation. If these areas are grazed in the future, grazing would follow the Santa Rita three-pasture rotation system, and impacts would be similar to those identified earlier in this section.

Impacts of Grazing Systems

The grazing systems proposed would have important impacts on the vegetation communities within the ES area, affecting species composition, ground cover, condition, and production. Refer to appendix B for information by grazing unit. Range studies conducted for trend analysis within the 16 Safford District grazing units managed under AMPs are inconclusive, primarily because livestock grazing was not reduced to carrying capacity on 15 of the units. The overstocking prevented application of all treatments, resulting in the grazing of all pastures during the year.

Table 3-3 shows the estimated changes in range condition and production predicted as a result of the proposed action. Lands in grazing units of the ES area would change as follows:

Range Condition and Production Classification	Estimated Change in Acres
Excellent	+ 42,758
Good	+ 169,390
Fair	- 28,058
Poor	- 184,090

These changes in range condition resulting from changes in plant vigor, species composition, and cover are the basis for the prediction increase of 14,237 AUMs of additional forage.

TABLE 3-3
IMPACTS OF PROPOSED GRAZING SYSTEMS ON RANGE CONDITION AND PRODUCTION

GRAZING SYSTEMS	PRESENT CONDITION (ACRES)				PROJECTED CONDITION 15 YEARS (ACRES)				PROPOSED LIVESTOCK AUMs	PRESENT WILDLIFE AUMs	PROJECTED PRODUCTION 15 YEARS AUMs
	EXCELLENT	GOOD	FAIR	POOR	EXCELLENT	GOOD	FAIR	POOR			
Rest Rotation 13 Grazing Units 19% of ES area within grazing units	1,600	19,440	278,357	146,465	17,462	80,490	245,384	102,526	19,198	268	21,864
Santa Rita System 25 Grazing Units 20% of ES area within grazing units	3,360	22,446	179,147	271,883	14,562	69,624	202,332	190,318	24,923	437	29,174
Deferred Rotation 8 Grazing Units 6% of ES area within grazing units	6,720	20,885	95,113	24,530	10,084	32,279	85,016	19,869	30,525	305	33,979
Yearlong Grazing 24 Grazing Units 18% of ES area within grazing units	26,220	36,772	299,659	64,560	34,787	74,445	265,685	52,294	17,906	698	21,227
Seasonal Grazing 17 Grazing Units 8% of ES area within grazing units	8,120	28,315	71,755	67,960	11,537	37,020	72,545	55,048	18,158	420	20,831
Custodial Management 33 Grazing Units 11% of ES area within grazing units	15,420	17,226	122,469	100,907	15,420	15,326	121,349	103,927	3,989	---	3,989
Ephemeral Management 65 Grazing Units 16% of ES area within grazing units	200	480	176,914	189,475	200	2,249	194,092	170,528	Ephemeral	---	Ephemeral
Deferment of Grazing Use 1% of ES area within grazing units	0	0	0	15,600	0	780	3,900	10,920	---	---	---
Unallocation of Grazing Use, 1% of ES area within grazing units	0	0	6,920	27,144	346	2,741	11,976	19,001	162	---	162
TOTALS	61,640	145,564	1,230,334	908,524	104,398	314,954	1,202,279	724,431	114,861	2,128	131,226

The figures estimated in table 3-3 were derived from the methodology discussed in appendix A.

Construction of Detention Dams

The construction of the Barrier, Tanque, and Slick Rock detention dams would temporarily impact 100 acres of land and permanently impact 50 acres of land. The direct impact of construction on vegetation would be insignificant because the proposed construction sites are generally eroded and support little vegetation (mainly creosotebush).

On the other hand, these dams would highly benefit vegetation. On the basis of past revegetation above the San Simon Fan Structure the filling of the San Simon channel and subsequent revegetation would result in an additional 4,000 to 8,000 AUMs of usable forage yearly. Approximately 15 to 25 years, however, would be needed for the area now proposed for deferred grazing to reach a condition to sustain livestock. Livestock would be allowed to graze the area after revegetation, and forage allowances would be made for other resources (wildlife, recreation, and watershed).

The revegetation would primarily consist of natural species found within the San Simon Channel:

Trees	Grasses	Shrubs
Mesquite	Vine mesquite	Four-wing saltbush
Salt cedar	Johnson grass	
	Blue panic	
	Alkali sacaton	

Introduced species, blue panic, would be used to rehabilitate areas disturbed during construction of the detention dams.

Construction of Other Range Improvements

Construction of range improvements (excluding the detention dams) would temporarily remove 639 acres from production and permanently remove 312 acres. Natural rehabilitation for the area temporarily removed would be closely related to precipitation. Areas receiving 16 inches or more of precipitation would recover within 5 years. Areas receiving less than 10 inches of precipitation would recover in approximately 15 years. Table 1-2 summarizes acreages that would be removed from vegetation production by proposed range improvements. Refer to appendix D for range improvements by grazing unit.

Included in the range improvements are approximately 300 miles of primitive two-track roads needed for maintenance of the improvements.

These roads would remove 225 acres from vegetal production in the ES area.

Threatened and Endangered Plant Species

Table 3-4 reveals that of the 10 candidate endangered and threatened plant species actually observed in the ES area during the study period, none are expected to be affected by the proposed action because they are not palatable to livestock. The one candidate endangered or threatened species that would be impacted by livestock grazing if it actually occurs in the area is Cowania subintegra. The probability of its occurring in the ES area is low, however, because it appears to be specific to the Retriever Soil Series, which does not occur in the ES area.

Poisonous Plants

The proposed action would have no impact on livestock losses due to poisonous plants.

Deficiencies in Impact Data

The following deficiencies exist in data relating to the impact of the proposed action on vegetation.

(1) In estimates of vegetation production, information on species composition, diversity, and cover was not inventoried by vegetation type or range site. As a result, predictions of range production cannot be substantiated by range site potential. Data needed for the desired level of analysis were not available. In their place, those predicting the proposed action's impact on production, cover, and range condition used comparable protected areas, properly used areas, literature, and professional judgment.

(2) Resource specialists estimated range conditions for the ES area. Existing studies for the District conflict greatly and are obviously in error when compared with observed range conditions. See appendix A for the methodology used in determining range condition.

TABLE 3-4

HABITAT AND EFFECTS OF LIVESTOCK GRAZING ON THREATENED AND ENDANGERED PLANTS

Name	Probable Effects of Livestock Grazing	Habitat/Remarks
Echinocereus triglochidiatus var. arizonicus	NAOESA*	Oak woodland
Cowania subintegra	NAOESA	Limy tuff ridges
Sphaeralcea fendleri var. albescens	NAOESA	Oak woodland
Erigeron pringlei	NAOESA	Cliff pockets and ledges
Gutierrezia linoides	NAOESA	Is not taxonomically different from other Gutierrezia species
Mammillaria orestera	NAOESA	Oak woodland
Neolloydia erectrocentra var. erectrocentra	NAOESA	Grassland
Eriogonum apachense	NAOESA	Limy tuff ridges
Cheilanthes pringlei	NAOESA	Moist areas in mountains
Pectis rusbyi	NAOESA	Summer annual
Eriogonum capillare	NAOESA	Winter annual along Gila River
Erigeron lobatus	NAOESA	Winter annual
Puccinellia parishii	NAOESA	Annual grass along Aravaipa Creek
Atriplex griffithsii	NAOESA	Saline-alkali soils on playas
Plummera ambigens	No effect	Oak woodland
Echeveria rusbyi	No effect	Rock crevices or ledges Full or partial shade
Sophora formosa	No effect	North, NE or NW facing, eroding slopes
Perityle lemmoni	No effect	Rock cracks, crevices, ledges
Plummera floribunda	No effect	Oak woodland
Echinocereus ledingii	No effect	Rock crevices, ledges Oak woodland
Ferocactus acanthodes var. eastwoodiae	No effect	Sonoran Desert
Fraxinus anomala var. lowellii	No effect	NE or NW facing slopes in chaparral
Limonium limbatum	No effect	Salt marsh areas
Choisya arizonica	No effect	Partial or full shade Deep canyons

*NAOESA - Not actually observed in ES area during study period. Livestock grazing effects are thought to be negligible with exception of c. subintegra.

ANIMALS

Summary

Overall, the proposed action is expected to benefit wildlife habitat (food and cover) and thus benefit wildlife. The action proposes to reduce grazing pressure, (see appendix B for proposed reductions for individual grazing units), impose stricter limits on livestock grazing, increase the vigor and density of range vegetation, and provide a high degree of protection for important aquatic and riparian habitats. Thirty-six percent of the grazing units' public lands would be rested from grazing each year, not including the custodial allotments. When grazing is allowed moderate use will be enforced.

Range condition is expected to improve gradually over the initial 15-year period. The lower semidesert areas (desert scrub and desert grassland) are expected to improve rather slowly, depending upon factors such as present range condition and rainfall.

Schmutz and Smith (1976) and Smith and Schmutz (1975) provide insight into the slow process of range recovery in desert grassland. These authors revealed that the density of mesquite trees was greater on grazed ranges, but that mesquite also continued to invade ungrazed range. Martin (1975) reported that mesquite-infested ranges can be restored to full productivity only if mesquite is removed. The proposed action, however, recommends no such plant removal projects. Conversely, such invaders as mesquite and prickly pear cactus provide important habitat requirements for many species of wildlife.

Within these low-elevation areas certain sites that accumulate water, such as desert washes, are expected to improve at a more rapid rate. Desert mountain ranges where rainfall and potential to produce vegetation are greater are also expected to improve at a rapid rate. Because of permanent water and within the framework of perpetual succession, protected riparian vegetation and adjacent bottom lands are expected to greatly improve in 3 years.

Residual impacts inherent with the proposed action would be most serious during periods of low rainfall when production of range vegetation is low.

Many factors other than livestock grazing affect wildlife populations, although wildlife populations will fluctuate primarily with fluctuations in rainfall.

Table 3-5 shows expected overall impacts for representative wildlife species, including those believed to be most affected by livestock grazing and table 3-6 shows expected impacts of grazing systems on

TABLE 3-5
ANTICIPATED OVERALL IMPACTS ON WILDLIFE POPULATIONS
(After 15 Years Full Implementation of the Proposed Action)*

Key to Anticipated Impacts	
1	Habitat condition is expected to decline with a slight decline in population numbers.
**2	Little appreciable change in population numbers is expected.
3	Habitat conditions is expected to attain up to 25 percent of potential, whereby wildlife species could increase.
4	Habitat condition is expected to attain 25-50 percent of potential.
5	Habitat condition is expected to attain 50-75 percent of potential.
6	Habitat condition is expected to attain 75-90 percent of potential.
7	Highly desirable habitat condition is expected: 90-100 percent of potential.

*Wildlife populations would continue to fluctuate, influenced primarily by weather conditions (which result in varying amounts of food available to range animals) and by inherently cyclic characteristics of the population. Resource management objectives are expected to be difficult to achieve, particularly during the early implementation stages of the proposed action. The proposed action is expected to be adjusted and refined during the 15-year period, providing additional benefits for many wildlife species beyond the 15-year period.

**Certain of these species have limited or questionable occurrence on small tracts of public lands. Others, because of their habitat requirements and area of occurrence, are not expected to change significantly with improvement in range condition. For several species the ES area can provide only marginal habitat.

NOTE: Predators are affected by habitat conditions of their prey. Rodents and insects, for example, provide food for numerous other species.

TABLE 3-5
ANTICIPATED OVERALL IMPACTS ON WILDLIFE POPULATIONS

1.	Black bear	See table 3-7
2.	Mountain lion	" " "
3.	Javelina	" " "
4.	Elk	See table 3-7
5.	Mule deer	" " "
6.	White-tail deer	" " "
7.	Antelope	See table 3-7
8.	Black-tailed jackrabbit	1-2
9.	Desert cottontail	4-5
10.	Rock squirrel	2
11.	Harris antelope ground squirrel	2
12.	Pocket mice	1-2
13.	Merriam's kangaroo rat	1-2
14.	Grasshopper mice	4-5
15.	Harvest mice	4-5
16.	Deer mice	4-5
17.	Hispid cotton rat	4-5
18.	White-throated woodrat	2, 6-7
19.	Coyote	2, 6-7
20.	Kit fox	5-6
21.	Grey fox	5-6
22.	Ringtail	5-6
23.	Raccoon	5-6
24.	Coati	2
25.	Skunk(s)	5-6
26.	Bobcat	5-6
27.	Great blue heron	5-6
28.	Cooper's hawk	5-6
29.	Golden eagle	5-6
30.	Gambel's quail	5-6
31.	Sealed quail	5
32.	Montezuma quail	5
33.	Killdeer	5-6
34.	Mourning dove	5-6
35.	Ground dove	5-6
36.	Whip-poor-will	2, 6-7
37.	Poor-will	6
38.	Common nighthawk	2, 6-7
39.	Lesser nighthawk	6
40.	Horned lark	2, 6-7
41.	Meadow lark	2, 6-7
42.	Lark bunting	6
43.	Cassin's sparrow	6
44.	Dark-eyed junco	6
45.	Sage sparrow	6
46.	Chipping sparrow	6
47.	Brewer's sparrow	6
48.	White-crowned sparrow	6
49.	Couch's spadefoot toad	5-7
50.	Plains spadefoot toad	5
51.	Western spadefoot toad	5
52.	Great Plains toad	5
53.	Red-spotted toad	5-6
54.	Woodhouse's toad	5
55.	Leopard frog	5-6
56.	Eastern fence lizard	5-6
57.	Desert grassland whiptail lizard	5-6
60.	Little striped whiptail lizard	5-6
61.	Texas blind snake	5-6
62.	Ringneck snake	5-6
63.	Western hognose snake	5-6
64.	Western hook-nose snake	5-6
65.	Black-neck garter snake	5
66.	Checkered garter snake	5

THREATENED/ENDANGERED SPECIES

1.	Black-tailed prairie dog (not known to occur at present)	5-6 if present
2.	Mexican wolf (may occur sporatically)	2 " "
3.	Desert bighorn	See table 3-7
	(habitat on public lands is limited in size but highly important)	1-2
4.	Black-crowned night heron (desirable permanent habitat not available, seldom observed)	2
5.	Snowy Egret (desirable permanent habitat not available, seldom observed)	2
6.	Black-bellied tree duck (desirable permanent habitat not available, seldom observed)	2
7.	Mexican duck (desirable permanent habitat not available, seldom observed)	2
8.	Zone-tailed hawk (present in very low numbers)	2, 6
9.	Grey hawk (not known to occur at present)	2
10.	Black hawk	6-7
11.	Southern bald eagle (wintering birds)	6
12.	Peregrine falcon (observation increasing)	6
13.	Buff-breasted flycatcher (may occur sporatically in low numbers as a transient)	6
14.	Beardless flycatcher (limited preferred habitat)	6
15.	Green toad (uncommon)	5
16.	Gila monster (widespread occurrence)	6
17.	Desert tortoise (may occur in low numbers, not confirmed)	5-6
18.	Green rat snake (uncommon, limited suitable habitat)	6
19.	Western Massasauga (no recent confirmation of occurrence)	5
20.	Rock rattlesnake (uncommon, limited suitable habitat)	6
21.	Twin-spotted rattlesnake (uncommon, limited suitable habitat)	6
22.	Loach minnow (habitat secure in Aravaipa Canyon Primitive Area)	6 elsewhere if present
23.	Round-tailed chub (habitat secure in Aravaipa Canyon Primitive Area)	6 " " " "
24.	Spikedace (habitat secure in Aravaipa Canyon Primitive Area)	6 elsewhere if present
25.	Gila topminnow (no recent confirmation of occurrence)	6 " " " "

TABLE 3-6
IMPACTS ON WILDLIFE OF THE ES AREA
(A Summary of Anticipated Impacts After 15 Years of Full Implementation of the Proposed Action)*

Grazing Systems (See map 1-3 for area)	Major Species or Group of Species Impacted	Anticipated Impacts With Regard to Potential (+) = improvement (-) = decline (0) = no appreciable change	Comments and Rationale For Anticipated Impacts
REST ROTATION			
334,142 Acres Public Lands (13 grazing units)	Mule deer	Moderate-to-moderately high +	Rest-rotation grazing is not widely proposed for the better deer and javelina habitat. The 41% proposed reduction in livestock numbers, limits imposed on forage utilization, increased water availability mandated in Instruction Memoranda 74-397 and 75-407, and predicted improvement in range conditions resulting from the grazing systems would improve habitat conditions for deer and javelina. Some competition would occur, particularly between livestock and deer, in small stands of browse during winter grazing periods.
	Javelina	Moderate +	
	Antelope	Moderate-to-moderately high +	Predicted improvement in range condition and water availability would benefit antelope.
	Gambel's quail	Moderate +	Increased ground cover, food, and rest provided during the nesting season 2 years in 3, or 3 years in 4 would improve habitat for quail. Rest-rotation grazing has been proposed quite widely throughout the better scaled quail habitat and should result in significantly better habitat conditions for these birds than have existed in the past.
	Scaled quail	Moderate-to-moderately high +	
	Mourning dove	Moderate +	Anticipated increase in food and cover. Better water availability would improve habitat for doves.
	Small mammals, and their attendant predators	+, (-), 0; most species moderate +	Habitat conditions for the majority of species are expected to improve. For certain species previously mentioned in chapters 2 and 3, which prefer more open or deteriorated range, conditions are expected to decline slightly or remain static. Major changes in these populations are not anticipated. Overall, slightly more prey species should be available for avian and mammalian predators.
	Song birds	Moderate-to-moderately high +	Improved cover, food, water, and rest from livestock grazing during most nesting periods would improve conditions for most song birds, particularly ground dwellers. As a result, more song birds would serve as prey for avian predators. Habitat for wintering birds is expected to improve, and food is expected to increase.
	Reptiles and Amphibians	Moderate +	Reduced grazing pressure is expected to result in improved food and cover for most reptiles and amphibians. Livestock would not disturb water areas, including stock ponds in rested portions of grazing units. These areas would then be periodically available for use by amphibians and other wildlife.
	Threatened Species Known to Occur:		
	Gila monster	Low-to-moderate +	Overall improvement to habitat, including the habitat of prey species, is expected to improve conditions for the Gila monster.
SANTA RITA THREE PASTURE			
279,575 Acres Public Lands (25 grazing units)	Mule deer	Moderate-to-moderately high +	Proposed reduction in livestock number of 51%, limits on forage utilization and predicted improvement in range condition would improve habitat for deer and javelina. Rest from livestock grazing would occur 2 winters in 3 and is expected to provide an overall benefit to deer. Winter would occur 1 year in 3, and livestock and deer are expected to compete for desirable browse in the grazed pasture. Javelina are expected to benefit from grazing pressure and improved range condition.
	Javelina	Moderate +	
	Gambel's quail	Moderate-to-moderately high +	Proposed moderate average utilization of range vegetation, predicted increases in ground cover, and improved range condition would benefit quail. Rest from livestock use during 2 nesting seasons in 3 would also improve habitat for quail. Doves are expected to benefit somewhat from increased ground cover and food abailability, but more importantly from increased water availability.
	Scaled quail	Moderate-to-moderately high +	
	Mourning dove	Moderate +	
	Small mammals and their predators	+, (-), 0; most species moderate +	These species are expected to respond similarly to their predicted response to rest rotation grazing systems. Overall improvement should be somewhat greater since more area is rested under the Santa Rita system.
	Song birds	Moderate-to-moderately high +	Responses should be similar to predicted responses to rest rotation. Greater benefits should accrue to most species, since rest from grazing occurs 2 nesting seasons in 3 and winter use occurs 1 winter in 3. Recommended moderate use one winter is expected to benefit wintering birds.
	Reptiles and Amphibians	Moderate-to-moderately high +	Benefits should be somewhat greater than those anticipated for rest-rotation. Proposed moderate use of range vegetation and large areas of rest from grazing should improve habitat condition. Water areas would be undisturbed during the many rest periods, and amphibians would benefit.
	Threatened Species Known to Occur:		
	Gila monster	Moderate +	As with rest-rotation grazing, the Santa Rita system is expected to improve habitat.
DEFERRED ROTATION			
89,973 Acres Public Lands (8 grazing units including a variety of grazing schedules; riparian areas receive special	Mule deer	Low +	Deferred rotation is not widely recommended for the better deer habitat. The proposed 18% reduction in livestock numbers, recommended moderate use of vegetation, and increased water availability would benefit deer somewhat. Deferred systems, however, provide less rest or more frequent livestock grazing than the rest-rotation and Santa Rita systems and thus are expected to result in greater competition between livestock and deer and less improvement in plant vigor and density.
	Javelina	No appreciable change-to-low +	Reduced grazing pressure is expected to improve conditions for javelina. Fair to good numbers of javelina now occupy suitable habitat in these areas.

*Habitat condition and wildlife populations will fluctuate with fluctuations in rainfall. Adverse impacts to wildlife, however, will be magnified if livestock are allowed to graze during drought periods.

TABLE 3-6 (cont.)

Grazing Systems (See map 1-3 for area)	Major Species or Group of Species Impacted	Anticipated Impacts With Regard to Potential (+) = improvement (-) = decline (0) = no appreciable change	Comments and Rationale For Anticipated Impacts
DEFERRED ROTATION (cont.)	Gambel's quail	Low +	Reduced grazing pressure is expected to slightly improve quail habitat.
	Mourning dove	Low-to-moderate +	Some improvement in dove habitat is expected to result from reduced grazing pressure and increased water availability.
	Small mammals and their predator.	No appreciable change-to-low +	Minor changes in habitat could occur from reductions in present grazing.
	Song birds	Low-to moderate +	Reductions in present grazing and improved water availability are expected to improve habitat somewhat.
	Reptiles and Amphibians	No appreciable change-to-low (-)	The predicted slight increase in ground cover should provide minor improvements for most species.
	Threatened Species Known to Occur:		
	Gila monster	Same as above	Same as above.
YEARLONG GRAZING			
237,907 Acres Public Lands (24 grazing units)	Mule deer	Moderate +	The 33% reduction in present livestock numbers and proposed moderate use of vegetation would improve habitat and reduce competition between livestock and deer. Reduced livestock grazing would disturb fewer areas and result in better conditions for deer and other wildlife.
	White-tailed deer	Low-to-moderate +	Because white-tailed deer are less willing to forage over large areas and compete more closely with cattle for forage than mule deer, yearlong grazing would benefit white-tailed deer somewhat less than mule deer.
	Javelina	Low-to-moderate +	Some habitat improvement is anticipated from reduced livestock grazing pressure.
	Bighorn sheep	Low (-)-to-no appreciable change	Continued livestock grazing in the small but critical areas of public lands would not allow habitat to improve. Because these areas are preferred by sheep, with proposed livestock grazing, bighorn habitat condition is expected to decline.
	Gambel's quail	Low-to-moderate +	Reduced livestock grazing would benefit quail.
	Montezuma quail	Low +	Additional area free from or less disturbed by livestock would be available to these birds. Predicted increase in ground cover would also be beneficial.
	Mourning dove	Moderate +	Reduced grazing and improved water availability would improve habitat for doves.
	Small mammals and their predators	Low-to-moderate +	More area in better condition, increased ground cover, and improved water availability would result in overall habitat improvement.
	Song birds	Moderate + for mostspecies now present	Same as above.
YEARLONG GRAZING (cont.)	Reptiles	Low-to-moderate	Increased ground cover and reduced overall disturbance from livestock grazing would improve habitat for most species.
	Amphibians	No appreciable change	Because livestock are expected to use all water areas year round, little to no improvement in a habitat condition is expected for amphibians.
	Threatened Species Known to Occur:		
	Gila monster	Low-to-moderate	See reptiles above.
SEASONAL GRAZING			
98,732 Acres Public Lands (17 grazing units)	Mule deer	Low-to-moderate+	The proposed 9% reduction in livestock numbers and moderate use of vegetation would improve overall habitat. Muledeer and livestock would continue to compete, particularly on the winter seasonal allotments, and little improvement in desirable browse is expected. See Deferred Grazing, chapter 3.
	White-tailed deer	Low-to-moderate +	The majority of presently occupied white-tailed deer habitat within seasonal grazing allotments is in fair to good condition.
	Javelina	Low +	Fair-to-good numbers of javelina now occupy suitable habitat within deferred areas. The winter seasonal rotation systems would provide additional benefits to javelina.
	Gambel's quail	Low +	Quail would receive minor benefits from reduced grazing pressure.
	Mourning dove	Low-to-moderate +	Reduced grazing pressure and particularly improved water availability would benefit doves.
	Small mammals and their predators.	Low +	Same as above.
	Song birds	Low +	Same as above.
	Reptiles	Low +	Same as above. Reptiles are fairly abundant at present.
	Amphibians	Low-to-moderate +	Under winter seasonal systems water areas would remain undisturbed by livestock every year. Winter seasonal rotation systems would periodically leave water areas undisturbed by livestock. These areas would be available to amphibians during their reproductive period. Under summer seasonal systems, however, livestock would disturb water areas during the major portion of the amphibian reproductive period every year.
	Threatened Species Known to Occur:		
	Gila monster	Low +	See reptiles above.
CUSTODIAL LEASING			
38,161 Acres Public Lands (33 grazing units)	All wildlife species	Unknown	Insufficient information is available for these individual small tracts to predict impacts. No change from the present situation is expected (see Custodial Leasing, chapter 3).

*Habitat condition and wildlife populations will fluctuate with fluctuations in rainfall. Adverse impacts to wildlife, however, will be magnified if livestock are allowed to graze during drought periods.

TABLE 3-6 (cont.)

Grazing Systems (See map 1-3 for area)	Major Species or Group of Species Impacted	Anticipated Impacts With Regard to Potential (+) = improvement (-) = decline (0) = no appreciable change	Comments and Rationale For Anticipated Impacts
EPHEMERAL GRAZING			
250,155 Acres Public Lands (65 grazing units)	Mule deer	Low +	Termination of yearlong grazing in these areas would benefit the few deer that use them. Competition between livestock and deer for early spring forage would be reduced. The small amount of desirable perennial vegetation now present is expected to improve in vigor and eventually in density. Greater long-term benefits are expected for deer and other wildlife species beyond the initial 15-year period. Low erratic rainfall and eroded condition makes the potential of these areas for improvement low. Improvement is expected to require additional time. Improvement in water availability would benefit deer in these dry areas.
	Javelina	Low +	Small numbers of javelina are expected to benefit much the same as deer from improved habitat conditions resulting from proposed management.
	Gambel's quail	Moderate +	The recommended controlled grazing is expected to increase food and cover available to quail. Habitat, particularly in and along desert washes, would reflect greatest improvement. Overall potential of much of the area is low due to limited and erratic rainfall.
	Mourning dove	Moderate-to-moderately high +	Improved food and water availability would benefit doves. Desert wash areas are expected to reflect greatest improvement in condition. Where water is available, fair numbers of dove occur in these areas at present.
	Small mammals and their predators	Moderate +	Increases in food, cover, and water would benefit these species.
	Song birds	Moderate +	Habitat for the majority of song birds would benefit much the same as that mourning dove habitat. Birds wintering in the area also should realize improved habitat, including food availability.
	Reptiles	Low +	Increased food and cover are expected to benefit most species. Fair numbers and variety of reptiles are now present.
	Amphibians	Moderate +	Additional food and cover would improve habitat. Amphibians would have undisturbed use of water areas, such as stock tanks, when water is present and grazing is not authorized.
	Threatened Species Known to Occur:		
	Gila monster	Low +	See reptiles above.
DEFERMENT OF GRAZING USE			
14,050 Acres Public Lands			
A. Critical Watershed	All wildlife species	Moderate-to-high +	No livestock grazing would occur for the foreseeable future.
DEFERMENT OF GRAZING USE (cont.)			
B. Riparian Areas	Song birds	High +; most species	The proposed 3 to 5-year initial deferment in livestock use with the possibility of some subsequent light grazing (not to exceed 40%) is expected to improve stream bottom vegetation significantly and ultimately benefit numerous wildlife species. Many birds dependant upon overstory canopy cover are expected to benefit greatly. Beyond the initial 15-year period, long-term improvement would compound as riparian vegetation increases in density and as canopy cover heightens.
	-Raptors	Moderate-to-high +	Proposed management resulting in improvement of the riparian vegetation is expected to benefit all birds of prey.
	-Small (resident) mammals	Moderate-to-high	Improvement of ground-level vegetation would enhance habitat for all mammals. The degree of improvement would depend on whether grazing is allowed after the 3 to 5-year initial deferment.
	-Reptiles and Amphibians	Moderate-to-moderately high +	Same as above.
	-Fish	Low-to-moderate +	Some benefits are expected to accrue to fish during the initial 15-year period. Greater long-term improvement is anticipated with expected increases in riparian vegetation and heightening of the canopy cover. Improvement would vary in degree time, depending upon whether grazing occurs after the initial 3 to 5-year deferment.
	Threatened and Endangered Species		
	1. Species Known to Occur on a Regular Basis:		
	-Black hawk	Moderately high +	Improvement in the riparian vegetation is expected to result in the establishment of additional nesting sites. Overall improvement in stream bottom habitat should increase available food (prey) supply.
	-Southern bald eagle	Low-to-moderate +	Proposed management is expected to result in additional food (prey) available to wintering bald eagles in the Gila River complex and surrounding areas.
	2. Species That Occur Irregularily:		
	-Peregrine falcon	Low-to-moderate +	Increased food supply resulting from improved habitat condition is anticipated to benefit falcons, when present.
	-Black-crowned night heron	No appreciable change-to-low +	Appropriate habitat for this species is not present. Improved condition of streamside vegetation and increased numbers of amphibians for food would benefit birds occasionally present. Livestock grazing has little impact on habitat.
	-Snowy egret	Same as above	Same as above.
UNALLOCATION OF GRAZING USE			
4,014 Acres Public Lands	All wildlife species	Moderate-to-high +	No livestock grazing would occur for the foreseeable future.

*Habitat condition and wildlife populations will fluctuate with fluctuations in rainfall. Adverse impacts to wildlife, however, will be magnified if livestock are allowed to graze during drought periods.

wildlife. Future population other than for large mammals (table 3-7) cannot be estimated because population data do not exist for the numerous other wildlife species of the ES area.

General

Many factors influence wildlife populations. Clearly separating livestock-caused impacts from impacts caused by fluctuations in the weather is difficult. The problem increases as rainfall decreases from the average. All range animals are affected by low rainfall and resultant low food production. During dry periods wildlife will achieve little to no reproduction, and some wildlife will die whether livestock grazing occurs or not. Livestock grazing during dry periods aggravates the problem and prolongs the effects of drought. Therefore, the constant livestock stocking rates proposed for the grazing units in this ES area will result in adverse impacts to the range and wildlife if proper adjustments are not provided for livestock during drought.

The following criteria are used to evaluate impacts resulting from this large and complex proposed action.

Low-minor: Young, sick, and old animals would be subjected to increased competitive disadvantage. Mortality up to 5 percent could result.

Moderate: Depending upon their condition, additional animals in the above category would die; healthy animals and particularly pregnant individuals would undergo more than usual stress; productivity might be reduced up to 15 percent in the impact area.

High-heavy: Some healthy mature animals are expected to die, particularly in marginal habitat areas. A population reduction of 25-50 percent might occur within the impact area.

Severe: Severe impacts would occur whenever the normally licensed numbers of livestock are allowed to graze the range during drought conditions (periods when little or no plant production occurs). Resultant impacts are expected to be greater than for the high-heavy category.

Various aspects of grazing inherent in the proposed action are expected to impact wildlife species to varying degrees. Among these are degree of use of vegetation by livestock, trampling by livestock, time of use, and the grazing system employed. Most wildlife species would be impacted by several aspects of the proposed grazing, particularly small sedentary animals, which would be subjected to trampling and removal of food and cover by livestock.

The following discussion includes the major anticipated impacts to wildlife of the proposed action by impact category. The discussion centers on species or groups of wildlife that would be most adversely impacted by the proposal. The last section of the chapter attempts to assess the overall cumulative impacts of the proposed action on the wildlife species previously discussed.

Adverse Impacts Associated with Proposed Range Forage Use by Livestock

Of major concern when considering the impact of the proposed action on wildlife is the degree of livestock grazing. What remains on the ground for wildlife habitat requirements after livestock grazing is a central issue in the allocation of the range resources among wildlife and livestock. Livestock herds in the ES area are or have not been flexible (except on a voluntary basis) and production of vegetation is erratic due to fluctuations in rainfall. Under the proposed action, livestock are expected to eat between 20 and 60 percent of the year's growth of palatable forage while maintaining an average of 40 percent. Use in the 0 to 40 percent range (includes light to moderate grazing) is expected to lightly impact the majority of wildlife species. As use surpasses 40 percent and approaches the upper limit of 60 percent, however, impacts would increase. Impacts would be especially adverse when use approaches 60 percent in consecutive years.

This section considers impacts associated with livestock use apart from overall benefits that might accrue to wildlife from grazing systems that include various periods of rest (no grazing).

Large Mammals

Mule Deer. Livestock grazing, if not exceedingly heavy, is usually not detrimental to mule deer. In some cases such grazing can improve conditions for deer (Martin, 1975, Truett, 1972, and Hill, 1956). Competition between livestock and deer is usually low on ranges in good condition.

Mule deer and livestock would compete for desirable browse, particularly during winter, when other forage is dry and low in nutrition. Areas of most severe competition include the desert foothills (see map 2-10), where small stands of palatable browse are intermingled with larger amounts of grass. In work conducted in southern Arizona grass-shrub ranges, Short (1977) found that deer do not eat appreciable amounts of grass, but cattle consume foliage and fruit of browse species.

Plants expected to be most affected include four-wing saltbush, jojoba, desert ceanothus and the fruits of cacti. The entire canopy of most of these shrubs is within the reach of livestock and deer and is subject to grazing. These shrubs usually comprise a minor percentage of the plant species composition and livestock are expected to heavily use these plants heavy when grazing is allowed. Although most shrubs can sustain use set at 50 percent, 40 percent is the recommended upper limit for yearlong use of desert ceanothus (Neff, 1970). Plants can absorb heavy use under grazing systems that provide proper rest (Hormay, 1970), but competition would occur in the area being grazed.

Deer and livestock would compete to varying degrees for suitable forage during spring and early summer before summer rainfall. Competition is likely to be severe when winter rainfall is low, resulting in poor productivity of needed food plants for the critical dry period--spring through early summer. During these periods, use of range plants would approach the upper limit, and impacts are expected to be moderate to high.

Although impacts previously mentioned would occur, overall deer numbers are expected to increase (table 3-7) as a result of the proposed action's livestock reductions, moderate use, forage allocations and anticipated improvement in range condition.

White-tailed Deer. White-tailed deer would be more vulnerable to adverse impacts than mule deer at the upper levels of use because they occupy small home areas. When these areas are heavily grazed (particularily during dry periods), white-tailed deer are reluctant to leave their preferred locations in search of quality food elsewhere. Though white-tailed deer may periodically sustain heavy impacts in their habitat area, the population is expected to increase (table 3-7) with full implementation of the proposed action.

TABLE 3-7
POPULATION ESTIMATES FOR LARGE MAMMAL SPECIES

Present population based on AG&FD estimates for ES area. Future estimates based on 15 years of proposed action implementation.

	Present	Future
1. Mule deer	4,200	4,830 - 5,250
2. Javelina	4,135	4,550 - 4,750
3. White-tailed deer	550	630 - 650
4. Elk	35 - 40	1/
5. Bighorn Sheep	30 - 35	2/
6. Antelope	20	26 - 30
7. Mountain lion	8 - 12	2/

1/ Actions on public lands are expected to have little influence on the elk.
2/ Numbers not expected to change by any appreciable amount as a result of the proposed action. Bighorn sheep might decline slightly, and mountain lion might increase slightly.

Javelina. Normally the food habits of javelina and livestock do not closely overlap when livestock grazing is not excessive. During periods of higher-than-average forage utilization, however, removal of protective cover (most likely in foothill areas where mid and tall grasses predominate or occur as cover) could make javelina more vulnerable to depredation by predators and man (AG&FD, 1976c). Javelina would likely experience adverse impacts during periods of low rainfall, but overall impacts from livestock grazing are expected to be light. Even though javelina and livestock are expected to compete somewhat, the javelina population is expected to increase (table 3-7) due to improved range condition and reduced livestock grazing.

Elk. Elk should not be adversely affected during average conditions. Preferred elk habitat occurs outside areas of BLM jurisdiction. When present on public lands, elk occupy rugged terrain where allowed use by livestock has been reduced from that of the past. Reduced use and the rugged terrain are expected to result in highly adequate elk habitat. Actions on public lands are expected to little influence the herd.

Antelope. During dry periods, livestock are expected to compete somewhat with antelope, but under average conditions and utilization, little competition is expected. As range condition improves, competition would further decline. Antelope and livestock would then be better able to select their differing and preferred food plants (Larsen, 1967).

With improved range condition and water availability resulting from the proposed action, numbers of antelope are expected to increase (table 3-7).

Bighorn Sheep. Under the proposed livestock use, bighorn sheep and livestock would continue to compete heavily for forage in the relatively small but important area of public lands along the rims of Aravaipa Canyon. The area of greatest impact would include small portions of grazing units 128, 129, and 136.

Mountain Lion. The proposed action would make more natural food, primarily deer, available for the mountain lion. Lion numbers, however, are not expected to change by any appreciable amount. Lions would probably feed to a greater degree on the more abundant natural prey species and to a lesser degree on domestic stock.

Other Mammals. The AG&FD makes no population estimates for small animals, nor is such information available from any other source. This discussion will thus include those species believed to be most affected by the proposed action.

Most small mammals spend their entire lives within a small area and are incapable of moving appreciable distances in search of more favorable habitat. Small mammals depending upon preferred livestock forage plants for food and cover would be most adversely affected by livestock grazing. Species such as cottontail rabbits, harvest mice, and hispid cotton rats, which are more reliant upon relatively dense grasses, would be most vulnerable.

Species including ground squirrels, jackrabbits, and Merriam's kangaroo rats occur in more open areas and often achieve high populations in heavily grazed areas (Martin, 1975). The proposed action is expected to have minor impacts on these animals.

Small mammals such as pocket mice, grasshopper mice, deer mice, and skunks would become more susceptible to predation as use of vegetation, particularly grasses, reaches 60 percent. Under the proposed action a percentage of the seed heads of palatable livestock forage plants would remain intact after grazing and would be available as food for granivorous species. As plant densities increase, insectivores, including bats, should find more insects available for food.

Although some adverse impacts are anticipated in grazed areas, particularly during dry periods, most of these small mammals have high reproductive rates and populations capable of rapid recovery.

Many species, including ring-tailed cat, badger, skunks, foxes, coyote, bobcat, hawks, eagles, and snakes rely to varying degrees on small mammals for food. Shortages in the small-mammal food supply would most affect the less mobile predators (badger, foxes, bobcat, and a variety of snakes) that depend almost entirely on small mammalian prey. For this reason, the size of the heavily grazed area is important. Impacts would usually increase as use surpasses 40 percent and the size of the heavily grazed areas increase. The proposed action's overall impact on small mammals and their predators should, in most cases, be light to moderate, although some disturbance is expected, particularly during drought and in grass vegetation types.

Birds

Light to moderate grazing would probably not be detrimental to most rangeland birds (Buttery and Shields, 1975 and Wiens and Dyer, 1975). Sedentary ground dwellers associated with grassland vegetation types or requiring grass as an important component of their habitat would be most vulnerable to disturbance from proposed grazing systems. Because quail feed, nest, or roost on the ground, they would sustain varying degrees of adverse impacts as range use approaches the upper limits. Impacts would be especially adverse where heavy grazing is uniformly widespread. Of the three quail species in the ES area, Gambel's quail should be impacted least. Gorsuch (1934) stated that moderate grazing is not detrimental to Gambel's quail but could benefit their habitat.

Where grazing occurs in spring following periods of low winter rainfall, some competition for green plant material is expected. Availability of green plant food during spring directly relates to the reproductive success of quail (Gallizioli, 1960).

Although grass cover is a desirable habitat component (Gallizioli, 1965), on the basis of existing conditions and the potential of much of their presently occupied habitat, Gambel's quail appear to be better able to tolerate impacts associated with grazing than scaled and Montezuma quail.

Scaled and Montezuma quail depend heavily on grass cover (Brown, R. L., 1971 and Brown, D. E., 1970b). Most of the habitat for scaled quail is relatively level and accessible to livestock grazing. Montezuma quail habitat consists primarily of rugged terrain at the higher elevations, which is less susceptible to uniform heavy grazing. Forty percent is the upper limit of reasonable use for these quail. In areas readily accessible to livestock, impacts are expected to accrue rapidly to these grass-dependent ground dwellers as use surpasses 20 percent. Conversely, grazing can stimulate the production of food for Montezuma quail (Brown, R.L., 1971).

When uniform and widespread use of perennial grass exceeds 40 percent and approaches the upper limit of 60 percent, impacts resulting from the overall effects of grazing would be high, particularly for the Montezuma quail (Brown, R. L., 1971). Although areas of concentrated livestock use will develop under any grazing system under the proposed action, major problems are anticipated during periods of drought and low plant productivity.

Many grassland nesting birds, including the horned lark and meadowlark, are better adapted to grazed ranges (Buttery and Shields, 1975 and Phillips, Marshall, and Monson, 1964). These birds should not be materially affected by proposed range use.

Other resident species and wintering and transitory species such as lark bunting, Cassin's sparrow, sage sparrow, junco, chipping sparrow, Brewer's sparrow, and white-crowned sparrow should not sustain serious impacts.

With several notable exceptions, overall impacts to rangeland birds are expected to be light, although prolonged drought would heighten impacts. Even when utilization is high, a percentage of seed heads would remain on palatable livestock forage plants. Food-producing shrubs (primarily four-wing saltbush) are anticipated to sustain heavy use where they comprise a small percentage of the species composition when grazing occurs. Higher productivity and lower range use during more favorable moisture periods should provide carryover seeds for food during less favorable periods. Insect numbers are expected to increase as density of vegetation increases with time, resulting in additional food for a wide variety of wildlife, including birds.

Reptiles and Amphibians

The proposed livestock grazing program would probably disturb certain herptofauna. Species associated with grass vegetation types and particularly those associated with unprotected aquatic areas are believed to be most vulnerable. At the upper levels of use, increased vulnerability to predation is expected. The western box turtle would likely experience a small amount of competition for green feed during dry periods. Because reptiles and amphibians are sedentary and depend upon habitat conditions within a highly limited area, a variety of reptiles and amphibians are expected to be moderately to heavily impacted when grazing occurs in the heavier use areas such as bed grounds and water. Such species include: Couch's, plains, and western spadefoot toads; Great Plains, green, red-spotted, and Woodhouse's true toads; leopard frog; little striped whiptail, desert grassland whiptail, and Chihuahua whiptail lizards; and the following snakes: Texas blind, ring-neck, western hognose, western hook-nosed, black-necked garter, checkered garter, and massasauga.

Impacts, particularily to small animals, cumulate to a minor degree with the next impact category.

Impacts Associated with Trampling during High-Intensity Grazing

In the operation of proposed rotational grazing systems, the carrying capacity of the area to be grazed is established. Rotational grazing requires a portion of the area to be grazed at a higher intensity, usually for a shorter period than normally occurs. High-intensity grazing in spring increases the chance for disturbing and destroying the nests of ground-nesting birds.

Birds

Under present conditions, species most likely affected by livestock trampling under high-intensity grazing include Gambel's quail, scaled quail, Montezuma quail, killdeer, mourning dove, poor-will, lesser nighthawk, horned lark, and meadow lark. Ground doves, whip-poor-wills, and rufous-crowned sparrows should be less vulnerable to disturbance.

Disturbance to nests would be affected by nest placement. Nests located near or within obstructions (including rocks, cactus patches, and unpalatable bushes) would likely remain unharmed, whereas nests in more open locations might be disturbed. Because of their wide distribution, Gambel's quail and mourning doves would be vulnerable over large portions of the ES area. Gambel's quail usually nest near or within obstructions. Mourning doves electing to nest on the ground near clumps of grass would be especially vulnerable. Tree nesters would be little disturbed. Scaled quail usually nest within obstructions, and their nests would be disturbed only minimally. Montezuma quail nest in grass and could be greatly disturbed by heavy and widespread grazing. Killdeer nest in the open near water where livestock activity is especially concentrated.

The poor-will prefers the slopes of the desert mountains, whereas the lesser nighthawk prefers the lower deserts. Some evidence suggests that the lesser nighthawk can move its nest when disturbed (Phillips, Marshall, and Monson, 1964). Although both species nest on the bare ground, deaths attributed to trampling are expected to be minimal.

On public lands horned larks and meadow larks occur primarily in the eastern portion of the ES area. Both species nest in grass. The frequency of meadow lark nesting in the area is believed to be low.

Ground doves frequent lower drainages but sometimes nest in elevated sites. The whip-poor-will prefers the limited amount of more densely wooded area at the higher elevations. The rufous-crowned sparrow seeks grass on rocky hillsides but is not common in the ES area and should be disturbed little in its preferred habitat. Overall, outright destruction of nests from trampling is anticipated to result in only a minor amount of mortality.

Livestock grazing should little disturb birds that prefer to nest in bushes and trees. The majority of low shrubs in the ES area are normally unpalatable to livestock and are available for nesting. Among the bushes and shrubs present in good numbers, widespread, and desired by birds are several species of cacti, including cholla, four species of wolfberry (*Lycium*), two species of *Condalia*, and whitethorn acacia. Scrub oak is common at the higher elevations. Mesquite provides nesting sites over much of the area. Although livestock sometimes remove mesquite foliage within their reach, a large percentage of the total canopy is available to birds. Soutiere and Bolen (1976) found that doves prefer to nest among the large forks, crotches, and large branches of the main trunk and not within the foliage of mesquite. As livestock forage condition improves, less mesquite foliage would be browsed. Other important arborescent species include net-leaf hackberry, little-leaf sumac, desert willow, and salt cedar. In desert wash areas livestock graze heavily on some individual hackberry trees, often maintaining them as low shrubs and eliminating their potential as nesting sites.

Several shrubs, including four-wing saltbush, hairy mountain mahogany, jojoba, holly-leaf buckthorn, desert ceanothus, and silk tassel, are usually highly palatable to cattle and deer. Birds selecting these shrubs may be somewhat disturbed by foraging animals, depending on their location on the plant. Nests located in four-wing saltbush, jojoba, and desert ceanothus would be most vulnerable. These species are lower and largely within the reach of grazing animals. Portions of the canopies of remaining shrubs are usually unavailable for forage consumption. Holly-leaf buckthorn and silk tassel are not abundant in the ES area. In steep terrain a percentage of the palatable shrubs, including mountain mahogany, are not accessible to the large herbivores.

Mammals

High-intensity grazing may adversely affect certain small mammals. The overall impact of this disturbance, however, is anticipated to be minimal, since most of these species seek refuge and bear their young in burrows, rock crevices, and other obstructions, including woodrat houses. Species that bear their young upon or in vegetation above the ground would be most vulnerable. Depending upon site selection, species such as the black-tailed jackrabbit, desert cottontail, harvest mice, and hispid cotton rat would be disturbed. All of these animals have high reproductive rates, particularly during periods of favorable rainfall. Young black-tailed jackrabbits can move shortly after birth. Cottontail rabbits are helpless at birth but usually nest in protected areas to deter predation from overhead.

As evidenced by the amount of "sign" and actual observations of rodents and predators, certain areas can maintain high wildlife populations under existing intensive periodic grazing. These conditions exist in the rehabilitated areas of the main San Simon Channel, where rank stands of grass have been established. Other such areas could be created throughout in the ES area in conjunction with erosion control. Ingles (1954) stated that weedy tangles can be grazed by livestock to reduce protective cover, thus allowing natural predators a better opportunity to control rodent populations. Livestock trampling would disturb small-mammal burrows, but mortality to animals should be low. Burrows located in areas of sandy soil would be most vulnerable.

Reptiles

Reptiles would be affected by livestock grazing much the same as would small mammals. Reptiles behavior, however, decreases the period of possible disturbance at the ground surface. Most reptiles retreat from the surface to hibernate in winter, and many estivate during summer. When active diurnally during warm periods, reptiles seek overhead cover for protection and shade.

Amphibians

Amphibians, including frogs and toads, center their activity or important stages of their life cycle in or near water. Larval stages of these animals are especially vulnerable in small water areas. When grazing occurs, the disturbance associated with livestock movements is further concentrated at water. On public lands frogs are primarily confined to the permanently flowing water courses. The greatest period of vulnerability to frogs would occur when these areas are grazed. Toads would be most susceptible in water areas during their short reproductive cycle throughout broad areas at the low and middle elevations. During dry periods many of the toads seek refuge in burrows. Toads in the genus Bufo are more reliant on permanent water areas, and, like frogs, they would be most susceptible to disturbance when grazing occurs in these areas.

Competition for Spring and Early Summer Forage

Food available to range animals varies with the time of year. The period of greatest food shortage for most animals occurs during spring and early summer before summer rainfall. Periods vary somewhat with locality, but the most critical period throughout the majority of the area usually occurs from May until summer rains begin. During drought, and most immediately when winter rainfall is low, conditions for range animals are especially adverse.

Food shortages would arise, particularly during the early implementation stages of the various grazing systems. Resident wildlife and livestock would compete for all classes of food plants. The upper value of utilization (60 percent) would appear to be the rule rather than the exception in grazed areas during this period. As range condition and livestock forage condition improve with management, as postulated in the vegetation section of chapter 3, competition between livestock and wildlife for food plants should decrease.

Certain proposed grazing management systems make better allowances than others for the major period of food shortage.

Disturbance to Wildlife Associated with Livestock Grazing Habits

When grazing is allowed, livestock would concentrate near water. Range condition and utilization at water, however, would vary, depending upon the system of management. Systems that employ rest would maintain better range condition near water than areas grazed yearlong. Studies for monitoring the percentage use of vegetation by livestock have been located within 1 mile of water, and most studies are situated within 3/8 to 1/2 mile. Study areas located closer to water will reduce the size of the heavy livestock grazing area next to water.

Where terrain permits, livestock graze the level, more accessible areas first. As forage is depleted livestock move by varying degrees into more rugged terrain, usually at higher elevations and away from water. Under the proposed action wildlife inhabiting these more accessible areas would be more vulnerable to disturbance from grazing than those inhabiting the less accessible areas.

Areas in and next to canyons and desert washes are expected to be more heavily grazed than much of the adjacent open range because livestock and wildlife congregate in these areas. Desert washes and canyons vary in size and quality but occur throughout the rangeland. They usually represent islands of better habitat within the rangeland and as such present special problems to management. If implemented, the proposed action would reduce the area of use in and near washes from that of the past.

Where grazing occurs, highly palatable plants (usually termed ice cream species) comprising a small amount of the overall plant composition would be heavily grazed. The fate of some of these plants, such as small stands of palatable browse, would depend upon several factors: the grazing system, the degree to which they are grazed, and livestock accessibility to them. Where grazing occurs yearlong, highly palatable plants readily accessible to livestock (such as near water) would decline in vigor, and some would eventually die. In most cases this phenomenon has already occurred. Under grazing systems that employ moderate use and adequate rest, such as the Santa Rita three-pasture rotation system, palatable plants, including those near water, are expected eventually to increase in vigor and productivity.

Impacts Related to the Overall Mosaic of Grazing

When grazing systems are initiated, individual grazing units are divided into a number of pastures. Certain of these pastures are grazed on a rotational schedule. In the ES area, grazing units and pastures within grazing units are relatively small, aiding the movement of more mobile animals between areas of differing habitat conditions and livestock use and increasing the chance for some portion of the smaller preferred area of sedentary species to fall within an area not being grazed. If, however, adjacent pastures in adjacent grazing units are grazed simultaneously, undesirably large grazed areas could result, depending upon the amount of overlap of adjacent pasture boundaries. This situation would be especially serious during drought. Impacts associated with this grazing management problem would be modified by the proposed use.

Grazing systems will be adjusted at the time they are to be initiated. To the extent possible, adjacent pastures will not be grazed simultaneously, which will allow better interspersion of use and nonuse areas and will reduce the overall size of the use area. Simultaneous grazing of adjacent pastures in different grazing units, however, could result in excessively large grazed areas, detrimental to wildlife.

Impacts Associated with Proposed Grazing Management Systems

For grazing systems to improve vegetation condition and ultimately benefit wildlife, they must address specific problems inherent in the area. Most of these problems relate to degree of grazing use. If grazing systems are to benefit wildlife, grazing cannot be so heavy as to offset benefits accrued during rest. Grazing systems and use allowed must provide for dry years. Adequate food and cover must remain after grazing to provide habitat requirements during periods of low rainfall and low plant productivity. Spring and early summer constitute a major reproductive period for wildlife species but are usually a major period of food and cover shortage. Adequate vegetation should remain on the ground from the previous growing season to provide suitable food and cover during this important period. Where cattle can graze yearlong, evergreen browse provides highly desirable food for livestock and wildlife when other plants are dry.

In many areas throughout the desert mountains, palatable browse remains in small scattered stands. Often these desirable plants make up a small percentage of the overall plant composition and as such are heavily grazed. If, under livestock grazing, highly desirable plants occurring in small numbers are to increase in vigor and eventually density, grazing systems are needed that provide generous amounts of rest (Martin, 1975). Anticipated impacts of proposed grazing systems on wildlife are summarized in table 3-6.

Santa Rita Three-Pasture Grazing

This grazing system as practiced on the Santa Rita Experimental Range appears to be applicable to much of the ES area. The system design considers local plant growth criteria by grazing only one growing season in three. The overall plan attempts to modify the adverse effect of local weather anomalies. Rest periods in conjunction with proposed moderate use during grazing periods would increase density of vegetation, including that of the more desirable species. Food and cover should be adequate for most wildlife species except during droughts. Ground nesting birds and other small more sedentary animals would be undisturbed by livestock grazing during two reproductive seasons in three. After two growing seasons of rest, ground cover should be in satisfactory condition before spring-summer grazing during the third year. Some disturbance to wildlife is expected as grazing proceeds, but in most cases impacts would be mitigated by moderate use of vegetation.

Rest periods would allow plants and areas favored by livestock (including highly palatable species, watering locations, level sites, and desert wash areas) to improve in condition. Where water remains in rested areas, water-oriented species would be undisturbed. Winter grazing would occur 1 year in 3. During this period especially, small stands of highly palatable browse (ice cream species) are expected to sustain heavy use, but the amount of rest provided should allow these plants to increase in vigor and eventually in density. Some competition, particularly between livestock and deer, would occur in the area being grazed. Depending upon the overall mosaic of grazing and plant distribution in the area, larger animals are expected to move to more desirable areas if the need arises.

Since a portion of each year's forage crop is used, adhering to moderate use is important for providing adequate food and cover for wildlife during the rest periods.

Overall, the Santa Rita system, with proposed use, should substantially improve habitat for most species of wildlife. This statement is based on research conducted at the Santa Rita Experimental Range (Martin, 1975). The two key features of the proposed Santa Rita system are (1) the system meets the growth requirements of important forage plants except during prolonged drought, and (2) under this system these forage plants would be moderately used.

Rest-Rotation Grazing

Many of the attributes of the Santa Rita system apply to rest rotation. The rest-rotation systems provide less rest than the Santa Rita system and therefore promote a larger area of potential disturbance to wildlife. Livestock grazing under rest rotation, however, would not be as heavily concentrated, thus reducing potential disturbance.

Rest rotation allows winter use 2 years in 3 or 3 years in 4, depending upon the number of pastures employed. Livestock and deer would compete during these grazing periods, but rest-rotation grazing has not been widely proposed in the better deer habitat. Small amounts of highly palatable browse, including mountain mahogany, jojoba, hollyleaf buckthorn, desert ceanothus, and silk tassel, would sustain heavy use, primarily in the upper portions of grazing units 16, 17, 27, 59, 69, 44, and 43. More serious competition is expected in the upper portion of grazing unit 154. A minor amount of competition would occur for four-wing saltbush at the lower elevations.

Under rest rotation, rest would be provided during spring or summer or both, 2 years in 3 or 3 years in 4. This rest is expected to benefit many species of wildlife during a major portion of the reproductive period, including ground-dwelling birds, small mammals, and reptiles. It should especially benefit scaled quail, since the system would be used in a major portion of their better habitat.

Yearlong Grazing

Yearlong grazing tends to compartmentalize range use. Livestock would always heavily graze areas near water, which would remain in poor condition for most wildlife species. Depending on the availability of water, little if any livestock use might occur in areas of rougher terrain as exemplified by portions of the Mescal and Peloncillo Mountains. In small and well-watered grazing units, livestock can graze over the entire unit. On such grazing units where wildlife values are high, the proposed action calls for a reduction in livestock numbers, thereby providing more food and cover for wildlife. For example, substantial reductions on grazing units currently being heavily grazed in the Dos Cabezas Mountains would benefit many species of wildlife, including deer and Montezuma quail. For proposed reductions in individual grazing units, see appendix B.

This proposed action would reduce the size of the heavily used areas by reducing livestock numbers, percent utilization of vegetation, and the distance utilization studies are placed from water. More area would thus be in more satisfactory condition, and conditions for wildlife would improve. Under yearlong grazing, more mobile animals are expected to be only lightly impacted during most years. Moderate to high impacts could be expected for small sedentary and water-oriented species, including rodents, shore birds, reptiles, and amphibians and fishes in unprotected (unfenced) areas. The problem should not be magnified unless livestock water areas are increased or changed, since most of these areas are currently grazed yearlong. Where several new waters are proposed, reduced grazing pressure would be spread over a larger area of the grazing unit, thereby reducing impacts.

Seasonal Grazing

Grazing units or portions thereof under seasonal grazing management would employ 12 different grazing systems directed primarily toward improving warm-season perennial grasses. With the exception of grazing unit 15, ample rest is provided for this purpose. Grazing unit 15 contains little public lands and is normally not heavily grazed. The grazing system in grazing units or portions of grazing units 3, 4, 43, 49, 83, 91, 117, and 145 provide rest during the major portion of the growing season every year. Rest periods include the major portion of the spring reproductive period. Conditions for the small grounddwelling animals and especially species that prefer grass should improve in these areas.

The remainder of the seasonally grazed grazing units would provide rest every other year or 2 years in 3. Habitats are expected to improve in areas rested 2 years in 3 and grazed within the proposed limits. Three systems allowing grazing every other year, depending upon the degree of use, might slightly improve cover and food available to wildlife. Grazing every other year, however, would not provide a buffer for periods of low plant productivity. Food and cover in areas grazed every other year could be in short supply much of the time. Impacts are expected to range from moderate to high if grazing pressure is not significantly reduced during dry periods.

Grazing units 3, 4, 49, 83, 117, 134, and 145 would allow winter use 2 years in 3, every other year, or every year. Whenever livestock grazing occurs, particularly in the upper portions of these units, livestock and deer are expected to compete for browse. Use of browse would likely approach the upper limit of 60 percent or more during drought. Although rest is provided through the major portion of the growing season every year, grazing units 3, 4, 83, and 145 would be grazed every October through April. Under these conditions and in view of the potential of these areas, palatable evergreen browse stands are not expected to improve in condition and could be severely damaged. Systems that provide rest every year with moderate use are expected to provide improvement in habitat condition when use does not exceed 40 percent.

Deferred Grazing

Riparian Habitat. The majority of aquatic and associated riparian areas would be managed under deferred grazing. If grazing is allowed on these areas after the initial deferment (as outlined in chapter 1), periodically certain wildlife would be lightly to moderately impacted from trampling and removal of cover. Impacts would vary with the substrata. Rocky bottoms would receive little disturbance. Impacts would be greater in the more level areas of the flood plain and adjacent benchlands.

Small species that focus their activity or important stages of their life cycle at the water's edge would be most affected. Among these species are amphibians and garter snakes. Small minnows could be impacted particularly during periods of low water. Impacts would accrue to several larger predators. Species most affected include those most reliant for food upon small animals associated with aquatic habitat. With the black hawk, several levels of the food chain are involved. Frogs and tadpoles provide food for garter snakes, and both species are eaten by the black hawk. Frogs also provide food for the great blue heron and raccoon. Other upland animals previously mentioned and particularly small ground dwellers would be periodically disturbed where soil and vegetation are present.

The proposed action would be highly beneficial to species reliant upon the overstory vegetation (canopy) for food and nesting sites and particularly for a great variety of nongame birds. More food would be available for such avian predators as the sharp-shinned hawk, Cooper's hawk, and peregrine falcon. These and other species are dependent upon the smaller birds for food. Benefits would depend upon the kind and amount of riparian vegetation reestablished or maintained. Canopy-forming trees are extremely important to numerous breeding birds (Carothers and Johnson, 1975). With increased canopy cover, breeding bird density could increase two to eight times to achieve the densities for mixed broadleaf and cottonwood riparian plant communities (table 2-10) reported by Carothers and Johnson (1976).

The proposed action should improve water quality. Increased canopy cover might eventually reduce critical water temperatures, which would most benefit fish in the upper Gila River. Sediment loads from public lands would be reduced, further improving water quality. Map 3-1 shows aquatic and riparian areas expected to achieve and maintain good condition as a result of the proposed action.

The proposed action should improve habitat conditions for all species reliant upon the aquatic and associated riparian areas. Included are obligate species and many others more common to the upland. Where grazing is allowed moderate periodic impacts are expected for species and their predators associated with the water's edge and the low understory vegetation. Overall benefits, however, should be high.

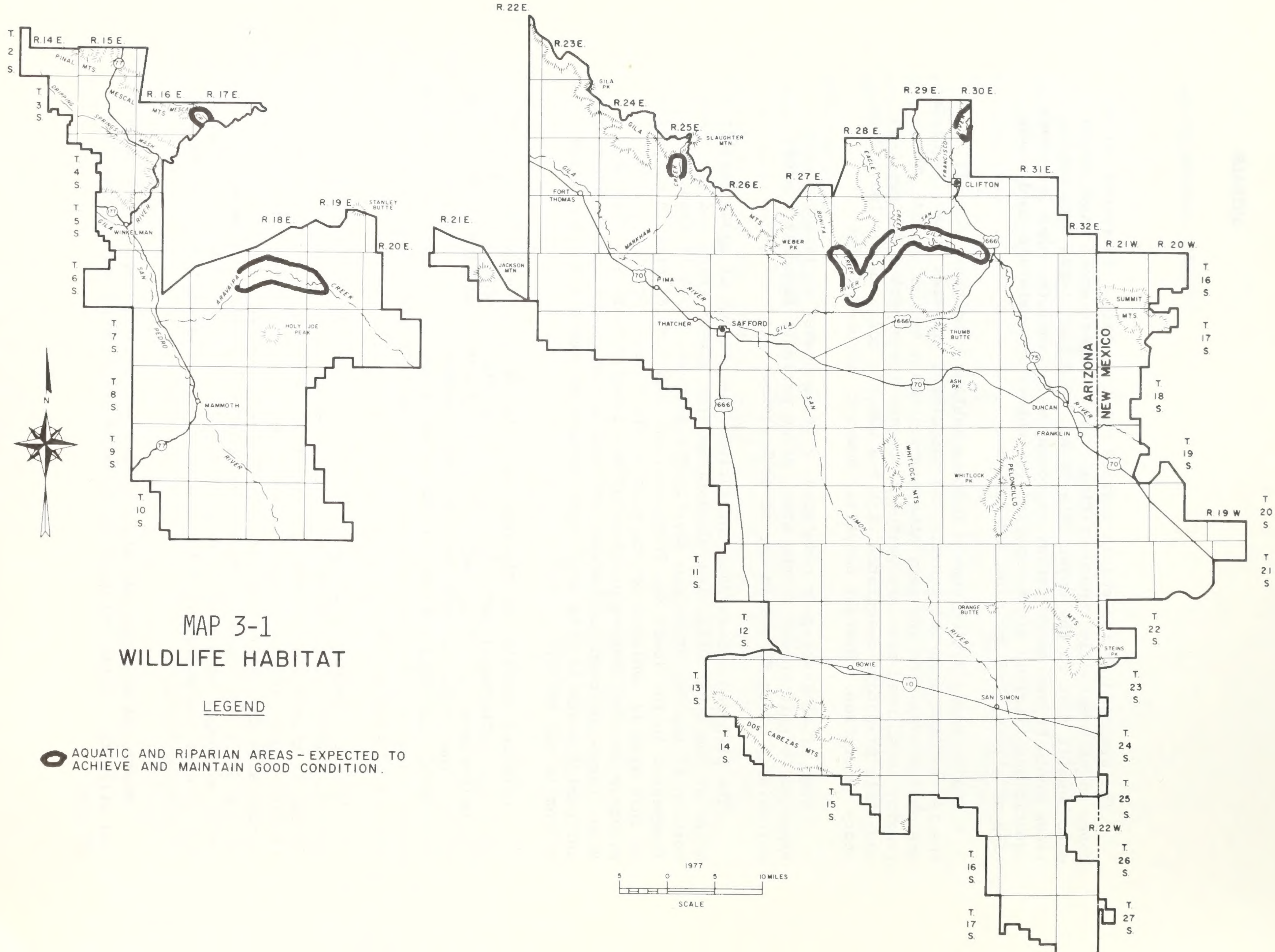
Even after fencing is completed, a small number of livestock are expected to gain access to the area, since periodic flooding hinders maintaining cross fences in the river bottoms.

The proposed action does not include the fencing of approximately 2 miles of the upper Gila River downstream from Bonita Creek and the lower portion of the San Francisco River. The pattern of public lands is fragmented in the lower San Francisco, and BLM jurisdiction in a portion of this area is confined to one side of the river. Nor is fencing proposed for the ES-area portions of the lower Gila River. The Gila River forms the boundary between the San Carlos Apache Indian Reservation and public lands in this area. The agency responsible for the river bottom is not known.

Unfenced aquatic and riparian areas would remain valuable to wildlife, but continued livestock grazing would significantly contribute to the maintenance of the present and potential poor condition of flora and fauna. The density of the most desirable members of the riparian plant community, including cottonwood and willows, would not materially increase nor would a more natural development of these important areas with associated wildlife species.

With the exception of approximately 1 mile, the main channel of the San Simon River is fenced to preclude livestock use. Maintaining fences in this area, however, is extremely difficult. Periodically, livestock gain access to the channel through the numerous and heavily eroded side channels. Most of the channel is included in a broad area of the San Simon Valley proposed for ephemeral grazing management and would no longer be grazed on a regular basis. Rehabilitated portions of the channel are currently being grazed under previously established grazing systems.

Protected spring areas will develop natural vegetation with associated wildlife. Spring protection projects are already in progress in the ES area.



MAP 3-1
WILDLIFE HABITAT

LEGEND

AQUATIC AND RIPARIAN AREAS - EXPECTED TO ACHIEVE AND MAINTAIN GOOD CONDITION.

Other Deferred Grazing Systems. The other deferred grazing systems are much the same as the seasonal systems. With the exception of a portion of grazing units 3 and 152, the deferred systems provide less total rest than the seasonal systems. Adverse impacts to vegetation and wildlife are expected to be greater as use surpasses 40 percent than for systems that provide more rest. Proposed livestock reductions would improve the present situations.

The proposed action would allow winter use 2 years out of 3 on grazing unit 114 and 3 years in 4 on grazing unit 165. This use would result in deer-livestock competition in grazing unit 114 and in the upper portion of grazing unit 165. It would not favor the increase of palatable browse.

Ephemeral Grazing Management

Under ephemeral grazing the number of cattle authorized to graze would vary as would the length of time grazing would be authorized. Ephemeral grazing management assumes that as long as annuals are available and succulent, livestock would concentrate their grazing on them rather than on remnant stands of perennial grass and browse (primarily saltbushes). Under these conditions desirable perennial vegetation, including plants in and near desert washes, would increase in vigor and to some degree density.

During dry periods many small animals are dependent for food upon the seeds of annuals produced during wet periods. Therefore, if ephemeral grazing is heavy it would create food shortages, primarily for the more sedentary species.

Numerous wildlife species, including a variety of reptiles, rabbits, rodents, small birds, javelina, and their attendant predators, survive in these ephemeral areas under difficult environmental conditions. Other more mobile species, such as migratory birds, hawks, eagles, and small numbers of deer, use these areas during specific periods or when conditions are favorable.

Within ephemeral areas certain reptiles, rabbits, rodents, and small birds, including Gambel's quail, are most vulnerable to adverse impacts from grazing. Larger more mobile animals are less vulnerable. Depending upon how grazing is managed, impacts from grazing could vary from practically none to high. When annuals are abundant and succulent, light livestock grazing is expected to result in minor impacts. During periods when no grazing is authorized, wildlife and livestock would not compete for vegetation produced.

Annual plant production occurs during two periods of the year. One group of annuals grows in spring as a result of winter-spring moisture conditions. Summer or warm-season annuals grow in response to summer rainfall. The period of succulence of annual vegetation does not extend from one season to the next.

Both periods have inherent problems with livestock use. The use of spring annuals appears to be potentially more deleterious than summer use. Spring annuals are less dependable, but they can provide nutritious food during the reproductive period of many wildlife species. Summer rain and resultant plant production are more dependable, but desirable perennial plants are green at this time and are more vulnerable to grazing during their growing season.

Custodial Permits

For approximately 60 sections of public lands scattered in small tracts throughout 33 grazing units, BLM proposes no positive management. Grazing of these areas would be left up to the management discretion of the individual ranch operator in conjuntion with adjacent State and private land under his control. How some of these areas are managed is not always known. Most are thought to be grazed yearlong, whereas others are used in conjunction with adjacent Forest Service land. Present habitat condition is also not known for many of these small tracts. The handling of these areas in this proposed action, however, would not result in any appreciable change over the present situation.

Impacts Associated with Proposed Range Improvements

Range improvement projects consisting of fences, water developments, and water delivery systems would slightly disturb wildlife during construction and for a short period after completion. Work crews would frighten the larger animals from work sites, but these animals would return shortly after work ceases. Small-animal habitat would be disrupted and in some cases altered in the small areas of soil surface disturbance and minor vegetation clearing. Installation, operation, and maintenance of two pumps along the Gila River would disrupt wildlife in these local areas. The pumps would be needed to supply livestock water to the adjacent upland, thus enabling the fencing of the river. Pumps would be located at existing access points. Fences constructed in and near the antelope range would meet BLM specifications established for antelope and should not greatly impede antelope movement.

Several new waters proposed for grazing units would alter present grazing of these areas. Reductions in livestock numbers would reduce overall grazing pressure in these units. Overall construction of new waters is expected to both beneficially and adversely impact wildlife. Wildlife would benefit from having additional water available to them both in the use and rested pastures. On the other hand, wildlife would be adversely affected by the presence of lifestock in areas previously not grazed because of the lack of water. Policy now requires that all water facilities BLM constructs or permits be made available to wildlife whether or not livestock are grazing in an area. Additional water and improved accessibility to water should especially benefit deer, antelope, doves, and numerous nongame birds.

Impacts to Endangered and Threatened Species

Poor conditions would remain for bighorn sheep along portions of the rim of Aravaipa Canyon. Species associated with riparian habitat, such as the black hawk, may periodically undergo light to moderate adverse impacts where grazing is allowed. Overall impacts, however, are expected to be positive for these birds and other wildlife species associated with the fenced riparian areas. These species should increase in numbers. Conditions are also expected to improve for wintering bald eagles and peregrine falcons. As additional information becomes available, endangered and threatened species would receive full consideration under all legislation set forth for their protection. In the future, attempts would be made to reestablish once endemic species and to create new habitat for others.

BLM has completed formal consultation under Section 7 of the Endangered Species Act with the Albuquerque Regional Office of the U.S. Fish and Wildlife Service. The Fish and Wildlife Service biological opinions have been included in this ES.

Impacts to Insects

Data from insect sampling indicate that the general reduction of the number of cattle on the range would slowly increase the number of insect species and populations due to the increase in the amount of vegetation. Presumably, populations of insect-feeding animals would also increase due to the increased abundance of insects. The complete elimination of grazing on exclosures, however, resulted in a very slight increase in the number of insect species in 14 years. Between 15 and 35 years of nongrazing appear to be required before the densities of a large number of insect species will significantly increase over present levels in the grazed areas. The differences in the effects of the various grazing systems is unknown.

The western viceroy, Limenitis archippus obsoletus, would probably not be adversely affected by the proposed action, as water flow in perennial streams would not be noticably affected.

Spring improvements would reduce insect populations in seep areas, since such improvements would reduce the size and duration of such seeps. These improvements, however, would not threaten or endanger any known species.

NATURAL HISTORY RESOURCES

Paleontological Resources

Overall, the proposed action would have a low beneficial impact on paleontological resources. It would reduce livestock numbers (appendix B), classify nine of the grazing units containing paleontological sites as ephemeral range, and intensively manage three grazing units containing such sites. Such management would benefit paleontological resources by increasing plant cover and reducing erosion. Table 3-8 shows percentage reduction in sediment yield expected under the proposed action. Natural geological forces, however, would continue to erode the sites, because the potential of the ephemeral range to produce plant cover to reduce erosion would remain low.

All of the paleontological sites would be grazed. Cattle would trample and break exposed fossils and contribute to bank sluffing by walking along and climbing up and down the banks, displacing fossils and resulting in the loss of their contextual value. The amount of trampling and bank sluffing would be low as would the adverse impact.

The expected loss of paleontological resources attributed to livestock grazing would be low and insufficient to change the scientific, educational, or recreation value of any sites, including the natural area eligibility of sites P-1, P-5, P-9, and P-15. Some scientific, educational, and recreational information would be lost on all sites.

Geological Resources

Easily eroded sediments creating a badlands effect are the notoriety of geologic sites G-1, G-2, and G-3, where overgrazing has accelerated natural geologic erosion. The proposed action would reduce livestock numbers, classify grazing units 190 and 184 as ephemeral ranges, and revise the AMP for grazing unit 48, which would increase ground cover and eliminate the escalated rate of erosion caused by overgrazing (table 3-8). The proposed action would have a low beneficial impact on geological resources, although their sighseeing values would not change.

TABLE 3-8
MANAGEMENT TYPE AND SEDIMENT YIELD REDUCTION
ON PALEONTOLOGICAL AND GEOLOGICAL SITES

Site No.*	Grazing Unit No.	Sediment Yield Reductions (%)	Management Type and Grazing System
P-1, P-15, P-16, P-17, P-18	190	5	Ephemeral
P-3, P-13, P-23	53	19	Ephemeral
P-5	147	0	Ephemeral
P-7	58	5	Intensive--Seasonal
P-9	48	8	Intensive--Santa Rita
P-12	46	4	Ephemeral
P-21	184	3	Ephemeral
P-22	174	0	Ephemeral
	175	2	Ephemeral
G-1	48	8	Intensive--Santa Rita
G-2	190	5	Ephemeral
G-3	184	3	Ephemeral

*P - Paleontological, G - Geological

CULTURAL RESOURCES

Summary

The proposed action could disturb or destroy 26 cultural resource sites qualified for nomination to the National Register of Historic Places and 74 sites unqualified for nomination to the National Register. No National Register sites would be adversely impacted. The proposed livestock grazing management systems would benefit cultural resource sites by decreasing disturbance from trampling and erosion. Some of the anticipated impacts from the construction of range improvements will be mitigated by construction stipulations in the proposed action (chap. 1), but mitigation itself will create adverse impacts. The indirect impact of vandalism is not expected to increase measureably.

Damage is expected to be greater in the early stage of implementation of the proposed grazing program but decrease after completion of range improvements and improvement of watershed. Adverse impacts are expected to be minor compared to the anticipated impact of vandalism unrelated to the proposed action. The combined effect of all actions would be a continuation of the downward trend in the condition of the cultural resources.

The methods used in analyzing expected impacts are discussed in appendix A.

General

The relationship between the proposed action and its impact on cultural resources has three components: (1) the cause of the impact, (2) the impact on the physical remains and environment, and (3) the impact on the cultural and scientific data and on the recreational and other values present in these remains. This section discusses the possible causes, types, and degree of impact in terms of these three components.

Causes of Impact

Environmental impacts may be direct or indirect. A direct impact is defined as "the effect an action will have on environmental resources as a direct and immediate result of construction or development" (Scovill, Gordon, and Anderson, 1972). Indirect impacts are "the effects on the environment which are not an immediate or direct result of an action, but which would probably not occur without it" (Scovill, Gordon, and Anderson, 1972).

Three components of the proposed action have the potential of directly impacting cultural resources:

- Livestock grazing
- Range improvements
- Mitigative measures

Ten types of range improvements are proposed:

(1) fence construction
(2) pipeline construction
(3) road construction
(4) water trough construction
(5) water storage tank construction
(6) earthen reservoir construction
(7) rainfall catchment construction
(8) spring development
(9) well construction
(10) detention dam construction

Three indirect impacts would result from the activities of the proposed action:

IMPACT	SOURCE
Visitor use and vandalism	Range improvement
Trampling and erosion near improvements	Range improvements
Erosion	Grazing

Types of Impact

According to the Code of Federal Regulations (36 CFR 800.9) adverse impacts on cultural resource sites would occur under the following conditions:

- destruction or alteration of all or part of a property;
- isolation from or alteration of its surrounding environment;
- introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or
- neglect of a property resulting in its deterioration or destruction.

The disturbances of the proposed action could affect the physical remains of the ES area's cultural sites and the data potential of these remains in several ways, as indicated in the following specific examples of the impacts outlined in 36 CFR 800.9. A property can be destroyed or altered by any component of the proposed action through the removal, breakage, or movement of individual artifacts or the disturbance of loss of horizontal or vertical cultural deposits. The result would be the destruction of all locational, chronological, and activity pattern data, making impossible the reconstruction of the history and processes of the site's occupation.

If a site could not be avoided by direct impacts, mitigative data recovery could save much of the data. Data recovery, however, also has adverse impacts. Generally not all the data are recovered, and data that are, cannot be studied by future researchers, who may possess more advanced techniques and more sophisticated theories. In either case, the depletion of the area's data base is irreversible.

Isolation from or alteration of a site's surrounding environment would result from the installation of a fence across or near the site or from the construction of range improvements that could significantly change the local environment. The greatest such impacts would result from erosion and the construction of earthen reservoirs. Such alterations or loss of environmental data would, in turn, decrease or destroy the potential for deriving paleoecological information on the site's occupation. Isolation or alteration of the site's immediate environment would also decrease the recreational values of the site.

The presence of cattle, range improvements, and eroded terrain would introduce to the cultural resource sites visual, audible, and atmospheric elements out of character with the property. Large, highly visible improvements, such as water storage tanks, rainfall catchments, and earthen reservoirs, would introduce the most of such elements. These elements could also adversely affect the property's recreational values and use.

The fourth adverse impact--neglect of a property resulting in its deterioration or destruction--could result from any of the measures in the proposed action. Such neglect might include the failure to recognize the need for preserving a cultural resource site in planning projects; the construction of improvements near a site, resulting in its increased use by cattle or visitors; and the failure to consider all possible impacts on the cultural resources during the planning of projects and the establishing of grazing systems.

Neglect could also take the form of exposing a site to future (indirect) impacts by the removal of the vegetation and soil covering a site or its watershed. Such vegetation and soil removal could result from construction or overgrazing and would result in increased erosion, increased damage from trampling, and increased visibility of the site to vandals. New or improved access into an area could increase visitor use and vandalism and the numerous adverse impacts that accompany them.

The proposed action has a built-in flexibility that allows for minor changes in the grazing plans. This flexibility, however, could have adverse impacts in the future. Any unforeseen changes in the intensity or pattern of grazing or in the range improvements required to implement these changes would directly and indirectly impact any cultural resources present. The location, nature, and degree of these impacts cannot be estimated, but the possibility of their occurrence must be considered as the proposed action is implemented and modified in any way.

Not all of the possible impacts discussed above are equally applicable to all sites. For example, a visual intrusion near a site might have a highly adverse impact if the site is significant for its recreational value. On the other hand, the intrusion might have a low or negligible adverse impact if the site is significant only for its data-yielding potential.

Degree of Impact

The degree or intensity of impact from direct and indirect causes is affected by three factors: the resource; the type of disturbance; and the size and depth of area disturbed and the duration of disturbance. The possible degree of impact to the primary types of sites from each component of the proposed action is shown in table 3-9.

Each type of impact has been assigned a relative rating indicating the expected degree of impact.

Low--The impact would not significantly alter the property's research, recreational, or other values.
Moderate--The impact would alter or destroy a significant portion of the property's research, recreational, or other values.
High--The impact would alter or destroy most of the property's research, recreational, or other values.

The degree of impact from any particular activity depends greatly on the spatial extent of the disturbance. A trough or fence would therefore have a lower impact than a catchment, even though the depth of disturbance might be the same.

As shown in table 3-9, earthen reservoirs, vandalism, and erosion would heavily impact all four classes of sites. Roads would heavily impact surface and architectual sites. Water storage tanks and rainfall catchments would heavily impact architectural sites. Trampling would heavily impact surface sites and nonarchitectural remains, and mitigative data recovery would have a high adverse impact on surface, subsurface, and nonarchitectural sites.

TABLE 3-9
POSSIBLE DEGREE OF ADVERSE IMPACT TO CULTURAL SITES

IMPACTING ACTIVITIES	TYPE OF SITE			
	Surface	Sub-Surface	Architectural	Non-Architectural
Fences	L	L	L	L
Pipelines	L	M	M	M
Roads	H	M	H	M
Water troughs	L	L	M	L
Water storage tanks	M	L	H	M
Earthen Reservoirs	H	H	H	H
Rainfall catchments	H	M	H	M
Spring developments	M	M	M	L
Wells	M	M	M	L
Data recovery	H	H	M	H
Trampling	H	L	M	H
Vandalism	H	H	H	H
Erosion	H	H	H	H

H--High impact, M--moderate impact, L--low impact

Expected Impacts

Of the 430 known cultural resource sites in the ES area (334 archaeological and 96 historical), 100 (73 archaeological and 27 historical) are expected to experience direct or indirect adverse impacts from the proposed action. Table 3-10 shows the number and types of sites expected to be impacted and the number of impacts.

TABLE 3-10
SUMMARY OF ADVERSE IMPACTS ON CULTURAL RESOURCE SITES

CLASS OF SITES	NO. SITES	NO. IMPACTS
National Register	0	0
National Register Quality		
Archaeological	15	23
Historical	11	17
Total	26	40
Not National Register Quality		
Archaeological	58	84
Historical	16	23
Total	74	107
Total Archaeological	73	107
Total Historical	27	40
Total	100	147

Predicted causes of site-specific adverse impacts are tabulated in table 3-11. All sites expected to be adversely impacted, directly or indirectly, from the proposed action are included. Multiple impacts are expected at some sites, and therefore the number of impacts is greater than the number of sites involved. For a description of the sites listed in table 3-11, refer to appendixes 2-G and 2-H.

Impacts by Component of Proposed Action

Three components of the proposed action would directly impact the ES area cultural resources: livestock grazing; construction and presence of range improvments; and mitigative data recovery. The indirect impacts of project-caused erosion, other erosion, trampling, and increased visitor use and vandalism are also expected to result from the proposed action.

TABLE 3-11

ANTICIPATED SITE-SPECIFIC ADVERSE IMPACTS ON CULTURAL RESOURCES

Allotment Sites	Impacts: Trampling	Streambank Erosion	Gully Erosion	Sheet and Rill Erosion	Proposed Project	Total
2						
AR-066	X		X			2
5						
AR-259	X					1
AR-260	X					1
HS-023	X					1
* HS-024	X					1
HS-058	X					1
6						
AR-248	X					1
AR-250	X			X		2
AR-251	X		X	X		3
HS-060	X					1
7						
AR-014					Fence	1
* AR-161					Fence	1
AR-197	X					1
AR-199					Fence	1
AR-200					Fence	1
AR-201	X				Fence	2
HS-022					Fence	1
HS-029	X		X	X	Fence	4
* HS-038		X				1
8						
AR-273			X			1
* AR-274			X			1
HS-082			X			1
HS-084			X			1
9						
AR-255	X					1
HS-062	X					1
HS-063	X					1
HS-064	X					1
12						
* AR-247			X	X	Fence	3
* HS-050			X	X		2
14						
AR-291			X	X		2
16						
* AR-070					Pipeline	1
* AR-202	X			X	Pipeline	3
22						
HS-052				X		1
* HS-053				X		1
* HS-057			X	X		2
26						
AR-241					Pipeline	1
* HS-001	X		X	X	Pipeline	4
30						
HS-045	X					1
32						
AR-242	X				Pipeline	2
43						
* AR-156		X		X		2
* HS-049	X					1
44						
* AR-243	X					1
45						
AR-005			X			1
AR-237	X					1
AR-240	X					1
46						
* HS-077			X			1
48						
AR-062			X			1
AR-113					Fence	1
* AR-114	X					1
AR-120			X			1
AR-121				X		1
AR-123			X			1
* AR-128		X	X			2
AR-132					Fence	1
AR-301		X	X	X		3
HS-032	X	X	X			3
52						
AR-265			X	X		2
AR-287				X		1
53						
AR-063			X			1
AR-299		X	X	X		3
AR-303		X	X	X		3
AR-304		X	X	X		3
57						
AR-131			X	X		2
* HS-077					Fence	1
58						
AR-135	X		X			2
59						
AR-141		X	X			2
60						
AR-142	X					1
AR-143		X				1
AR-144	X					1
AR-145	X					1
* AR-146	X					1
69						
* HS-002			X			1
HS-075	X				Well	2
HS-078		X	X			2
73						
AR-184			X			1
90						
AR-98			X			1
120						
AR-281	X		X			2
128						
AR-175	X					1
AR-206		X	X			2
129						
AR-189	X		X			2
AR-190	X					1
AR-191	X					1
AR-195	X					1
134						
* AR-264		X	X			2
151						
* AR-187	X					1
AR-261	X					1
154						
* HS-031			X			1
158						
* AR-221			X			1
AR-223			X			1
AR-286	X					1
165						
* AR-315	X					1
166						
AR-126		X				1
180						
AR-269			X	X		2
AR-272	X					1
181						
* HS-080	X					1
182						
HS-088					Concrete Dam, Storage Tank	1
183						
AR-280	X		X	X		3
186						
AR-174	X					1
190						
* AR-307		X	X			2
AR-309		X	X			2
AR-314			X			1

Totals 1/	Trampling	Streambank Erosion	Gully Erosion	Sheet and Rill Erosion	Proposed Project	Total
National Register Quality						
AR	6	4	6	3	4	23
HS	4	1	6	4	2	17
Total	10	5	12	7	6	40
Not of National Register Quality						
AR	27	9	27	13	8	84
HS	10	2	5	2	4	23
Total	37	11	32	15	12	107
Total AR	33	13	33	16	12	107
Total HS	14	3	11	6	6	40
Total	47	16	44	22	18	147

1/ Totals represent number of impacts, not number of sites.
* - National Register Quality AR - Archaeological HS - Historical

Livestock Grazing. The primary adverse impact of livestock grazing is trampling of cultural remains. The principal determinants of the degree of impact from trampling are the numbers and distribution of livestock being grazed.

Livestock distribution would be affected by the type of grazing system implemented and by the location of range improvements. The nature of this distribution does not affect the cultural resources except where grazing is increased in an area as a result of range improvements. Refer to the discussion on indirect impacts of range improvements for a description of these impacts.

The critical determinant of the degree of impact from trampling is livestock numbers. The proposed action calls for deferment of livestock grazing on 15,600 acres of land and maintenance of an additional 34,064 acres of land (8 grazing units) unallocated for grazing. This reduction in acres grazed would highly benefit the cultural resources present. The remaining 185 grazing units (2,311,998 acres) would be managed intensively, custodially, or as ephemeral range. Livestock numbers would be reduced on a majority of these units. The overall average reduction would be 33 percent.

An average livestock reduction of approximately 50 percent would occur on grazing units having cultural resource sites now being adversely impacted by grazing. The proposed reductions would be highly beneficial in reducing from moderate to low the adverse impact of trampling.

Direct Impacts of Range Improvement Construction. All possible types of direct impacts are expected to result from range improvement construction: destruction, alternation, isolation, visual intrusion, and neglect. The direct impact of destruction and alteration will be mitigated by avoidance and mitigative data recovery as stipulated in the proposed action. The slight residual impacts expected on cultural resources would be adverse but negligible.

Table 3-11 shows that 11 sites are expected to be impacted by fence construction, 5 by water pipelines and associated storage and trough facilities, 1 by a well, and 1 by a concrete dam and storage tank. The list of sites involved may change dramatically if previously unknown sites are discovered during clearance surveys, if sites listed are found to be outside of the impact zone, or if project locations are modified during final project planning. Sites that could be directly impacted by roads built for range improvement access cannot be identified, since the location of these roads has not yet been determined.

Construction Stipulations. If range improvements cannot be relocated to avoid cultural resource sites, the proposed action's stipulation requiring archaeological data recovery will be followed. Such measures, however, would have highly adverse long-term impacts on individual sites, since removing data from a site is a permanent irretrievable commitment of the resources. Moreover, not all data can be recovered in a salvage operation. Data no longer in its original context would be lost to future research, and the region's data base would thus decrease. The trade-offs resulting from this construction stipulation are as follows: direct disturbance from construction would be traded for visual intrusion, isolation, neglect, or data recovery impacts, and long-term preservation of the resource (avoidance) would be traded for a short-term gain in knowledge. The overall adverse impact of mitigative data recovery in the ES area is expected to be negligible. Little mitigative data recovery is expected, and what occurs would result in some data gains.

General Erosion. Erosion as an indirect impact of grazing results from poor watershed condition. The proposed action is expected to improve watershed condition and thereby reduce general erosion on grazing units. The indirect impacts of erosion on cultural resources are expected to decrease from the current level of moderately adverse to a level of low adverse. The expected improvement in watershed condition would thus have a low beneficial impact on the cultural resources. Table 3-11 lists the 82 sites expected to be impacted by erosion.

Indirect Impacts of Range Improvement Construction. The construction of range improvements is expected to impact cultural resources indirectly by increasing livestock trampling, erosion, visitor use, and vandalism. Increased trampling would occur around water improvements, such as troughs and earthen reservoirs, where livestock tend to congregate. The clearing of vegetation and removal of topsoil, where necessary to construct improvements, would increase erosion and expose cultural remains to trampling and vandalism. The construction or increased use of roads and trails for access to improvments may result in increased public travel to the project area. This increased accessibility to sites may increase vandalism at the sites, but this increase is expected to be negligible. The impact cycle is endless: each disturbance or impact increases the intensity of other impacts.

The indirect impacts of the construction of range improvements are expected to be long term and highly adverse at specific sites. Construction, however, should have a negligible adverse impact overall on cultural resources because of the few cultural sites expected to be involved. Indirect impacts of range improvement construction would thus be only negligibly greater than present impacts. These impacts cannot be predicted on a site-specific basis and are therefore not included in table 3-11.

National Register of Historic Places

No adverse impacts are expected to occur at historic sites listed on the National Register of Historic Places.

The proposed action would have only beneficial impacts on the Kearny Campsite and Trail (Site HS-004), as a result of the proposed Gila fence, which would exclude grazing from the campsite and the known portion of the Kearny Trail. No range improvements are proposed nearby, and no indirect impacts are expected.

The proposed action would also have no adverse impacts on Fort Bowie National Historic Site (Site HS-015), administered by the National Park Service (NPS). BLM proposes no range improvements for the site. Grazing would continue under restrictions requested by NPS. Most of the cultural features have been fenced to exclude cattle, and the present grazing program has had no significant impact on the remaining features.

National Register Quality Sites

A total of 26 sites (15 archaeological and 11 historical) determined to be of National Register quality are expected to be adversely affected by the proposed action. Table 3-11 displays the sources of impact expected at each site.

Three proposed fences and three water pipelines are expected to affect National Register quality sites. The expected impact will be adverse but negligible overall as a result of mitigative measures stipulated in chapter 1.

Other impacts to National Register quality sites are expected to be of the same degree as those discussed under Expected Impacts and will be mitigated in the same manner.

The Foote Wash-No-Name Wash Archaeological District (sites Ar-320-332), which has been determined to be eligible for inclusion in the National Register, has been disturbed by non-BLM flood control construction, but no impacts are expected from the proposed grazing program.

Sites Unqualified for Nomination to the National Register

A total of 58 archaeological sites and 16 historical sites not of National Register quality are expected to be adversely impacted by the proposed action. Table 3-11 indicates the types of direct and indirect impacts expected to occur at each site.

The proposed action would highly benefit these sites by reducing livestock trampling. Present adverse impacts at the 37 affected sites range from low to high but tend to be high. The proposed reduction in livestock numbers should lessen this overall impact to a low adverse status.

Twelve unqualified sites are in the impact zone of proposed range improvement projects. The impact is expected to be adverse but negligible because stipulated mitigative measures will be followed. Erosion would continue to disturb 58 sites, but the anticipated improvement in the watershed should reduce the present impact of moderately adverse to the level of low adverse, having a low beneficial impact. Increased visitor use and vandalism resulting from improved access and exposing of sites should have no measurable impact over the present level impacts on these cultural resources due to the small number of proposed range improvements and additional roads.

Other Cultural Sites

Impacts to unrecorded and unknown resources should be of the same kinds and have the same effects as those expected to occur at known sites. Possible disturbances to either unrecorded or unknown sites from range improvement construction should greatly decrease as a result of project clearance surveys and the mitigative measures included in the proposed action.

The degree of impact from trampling and indirect impacts cannot be predicted, but, on the basis of past and expected future impacts to known sites, these impacts are not expected to be great. Sites containing fragile surface remains would be the most vulnerable to disturbance from trampling, whereas sites containing great cultural depth would be damaged more from indirect impacts, such as erosion.

Buried sites with no visible surface remains could be disturbed by any construction or indirect impact that extends below the surface. Possible disturbances would be similar to those occurring at nonburied sites. Stipulations providing for halting construction, salvage, and other mitigative measures will be followed, and the resultant adverse impacts should be negligible as they are at present.

AESTHETICS

After the visual resource management (VRM) procedures are followed and the VRM contrast rating process (described in construction stipulation 8 in chapter 1) is employed, no long-term impacts would result in excess of the allowable objectives for the established VRM classes. A typical project of each type would have its greatest impact at the time of construction. The construction impact would be short term and would gradually diminish as the site is rehabilitated. The impact of the structures, however, would continue throughout their lives (table 3-12).

TABLE 3-12
PROPOSED RANGE IMPROVEMENTS HAVING VISUAL IMPACTS

GRAZING UNIT No.	GRAZING UNIT Name	PROJECTS Fence (Miles)	Pipe-line (Miles)	Stor-age Tanks	Earthen Reser-voirs	Rainfall Catch-ments	Wells	Spring Develop-ments	Water Troughs
				VRM CLASS I					
44	Horseshoe	1.7	3	2					
117	Dripping Spring				2				
118	Limestone Canyon		0.6	1			1	1	2
119	Mescal Mountain	5.3				1			
180	Black Rock		0.1	2					2
181	Spenazuma	2.8	0.4					1	4
182	Holdup Canyon		0.1	1	1		1		1
				VRM CLASS II, III, AND IV					
5	Limestone Canyon				1				
12	Hoverrocker				1			1	
26	Tollgate					1			
36	Carlisle				1				
43	Lazy "B"				2				
83	Apache Springs					1			
130	Aravaipa					1		2	
134	Klondyke				1				
167	Bullgap Community					1			
168	Turtle Mountain					1			

PRIMITIVE VALUES

Primitive Areas

Aravaipa Canyon Primitive Area would not be impacted by the proposed action since livestock grazing has already been eliminated from the area.

Natural Areas

The proposed grazing systems would benefit 22,480 acres of proposed outstanding natural areas and the proposed State natural area but would be detrimental to 7,720 acres of proposed outstanding natural areas. Reduction of livestock numbers would have a low beneficial impact on the four proposed research natural areas (4,720 acres).

The 41 existing range improvements identified in table 2-13 would result in from 6,560 to 13,120 acres remaining in poor range condition and not being representative of the scientific, educational, and recreational values for which the natural areas are to be established. The range improvements would have moderately negative impacts on from 9 to 19 percent of the total acreage proposed for natural area status.

The varying degrees of impact are defined using the following criteria.

Low Impact--The beneficial or adverse impacts of the action would be insufficient to change the quality of the natural values for which the area is to be established.

Moderate Impact--The action would beneficially or adversely change the quality of the natural values for which the area is to be established.

High Impact--The action would have an adverse impact sufficient to eliminate those natural values for which the area is to be established or a beneficial impact sufficient to restore or preserve the natural values for which the area is to be established.

Grazing Management System

Grazing systems were evaluated to determine whether they would preserve in a natural condition the research, educational, and recreational use values for which the areas are to be established (table 3-13).

TABLE 3-13
IMPACTS OF GRAZING SYSTEMS ON NATURAL AREAS

NATURAL AREA	GRAZING UNIT NO.	TYPE OF MANAGEMENT AND GRAZING SYSTEM	ACRES OF PUBLIC LANDS	DEGREE OF IMPACT
Fishhook Canyon	151	Intensive--Seasonal	3,800	M-
Markham Canyon	154	Intensive--Seasonal	2,080	M-
	158	Intensive--Santa Rita	160	L+
Johnny Creek	165	Intensive--Deferred Rotation	1,840	M-
Bonita Creek	165	Intensive--Deferred Rotation	360	H+
	166	Intensive--Deferred Rotation	7,720	H+
	167	Intensive--Santa Rita	680	H+
Eagle Creek	3	Intensive--Seasonal and Deferred Rotation	3,360	L+
	168	Intensive--Yearlong	2,160	L+
Gila Box	3	Intensive--Deferred Rotation	360	H+
	7	Intensive--Deferred Rotation	5,950	H+
	16	Intensive--Rest Rotation	840	H+
	17	Intensive--Rest Rotation	50	H+
	167	Intensive--Santa Rita	840	H+
Little Doubtful	45	Intensive--Santa Rita	1,200	L+
Dos Cabezas	72	Intensive--Yearlong	400	L+
Howell Canyon	73	Intensive--Yearlong	600	L+
	74	Intensive--Yearlong	1,040	L+
Government Peak	73	Intensive--Yearlong	1,480	L+
San Simon	90	Intensive--Santa Rita	160	H+
	91	Intensive--Seasonal	---	H+

H- High Impact, M - Moderate Impact, L - Low Impact, (+) Beneficial Impact, (-) Negative Impact.

Research Natural Areas. The proposed action will allow grazing to continue on the four proposed research natural areas. The proposal would reduce livestock numbers to improve the vegetation. The areas and their livestock reductions are:

1. Little Doubtful, grazing unit 45, reduce 60 percent;
2. Dos Cabezas, grazing unit 72, reduce 60 percent;
3. Howell Canyon, grazing unit 73, reduce 73 percent; and
4. Government Peak, grazing unit 73, reduce 73 percent.

If grazing continues, even at the reduced numbers, a climax condition would not be attained to allow comparison with grazed areas. The future value of these areas as RNA's would thus be lost.

Outstanding Natural Areas. The MFP recommendation for the outstanding natural areas (ONA) is to preserve their riparian habitat and their associated birdlife, fish, and animals.

Livestock grazing in the Gila Box (grazing units 3, 7, 16, 17, and 167) and Bonita Creek (grazing units 165, 166, and 167) would be deferred for 3 to 5 years to allow for the propogation and improvement in condition of the riparian habitat. Afterwards livestock grazing would be allowed. The AMPs have provided for adequate range rest and established stocking rates and levels of forage use (20-60 percent) in balance with the ONA's management objectives. Deferment of grazing for 3 to 5 years and AMP implementation would highly benefit the Gila Box and Bonita Creek ONAs.

The public lands in Eagle Creek ONA (grazing unit 3 and 168) are steep, poorly accessible to livestock, and contain little riparian habitat. Since the public lands are located in the uplands that would be grazed in conjunction with bottom lands, grazing on the public lands would be low. The public lands are presently in good range condition and would remain the same or improve to an excellent condition with implementation of the AMPs. The proposed action would have a low beneficial impact on Eagle Creek ONA.

The riparian habitat of the canyon bottoms of Fishhook Canyon (grazing unit 151), Markham Canyon (grazing units 154 and 158), and Johnny Creek (grazing unit 165) would be grazed in conjunction with the uplands. As in the past, grazing in the canyon bottoms would exceed the 20-60 percent utilization of the proposed action and would prevent the understory vegetation or new tree saplings from becoming established or from maintaining good plant vigor. Such grazing would thus have a moderate negative impact on these ONAs.

The seasonal and deferred rotation grazing systems proposed for Fishhook Canyon (grazing unit 151), part of Markham Canyon (grazing unit

154), and Johnny Creek (grazing unit 165), would not provide adequate range rest for the propagation and establishment of the riparian vegetation. These systems would thus have a moderately negative impact on these grazing units. In Aravaipa Canyon Primitive Area, eliminating grazing for 2 to 3 years was necessary before riparian vegetation increased significantly. Without adequate rest the riparian habitat would remain the same or improve only slightly.

The Santa Rita three-pasture rotation system proposed for a portion of Markham Canyon (grazing unit 158) in 2 to 3 years would provide adequate range rest to improve the condition of the existing riparian vegetation. In 6 to 10 years this system would substantially increase the amount of vegetation. The Santa Rita system would moderately benefit the natural areas. The system's grazing of bottom lands in conjunction with the uplands, however, would distribute forage utilization unequally and result in the canyon bottom being grazed in excess of 60 percent. Such overgrazing would thus offset the moderately beneficial impact of adequate range rest and result in only low beneficial impacts.

State Natural Area

The San Simon Natural Area (grazing units 90, and 91) was recommended as a scientific study area. Numerous studies have been conducted on this creosotebush area because of its representativeness of the Chihuahuan Desert shrub type in Arizona. The natural area proposal concluded that livestock grazing would be a compatible use as long as stocking rates were based upon forage production and climatic changes. The proposed action would implement an AMP that would establish stocking rates in balance with grazing capacity, provide adequate rest of the range, and establish utilization of forage at 20 to 60 percent. Implementation of the AMP would thus preserve the scientific study values of the site and have a high beneficial impact.

Range Improvements

Range improvements were evaluated to determine whether their location and function would affect the natural condition of the proposed natural areas. The evaluation determined that only those range improvements directly supplying water to livestock, such as troughs, springs and reservoirs, would affect their natural condition.

As in the past, an area of approximately 160 to 320 acres around each of the 18 water troughs, 5 developed springs, and 18 stock reservoirs (table 2-15) would remain in poor range condition. Poor range condition is caused by livestock staying close to water until all available forage is gone, causing a difference in plant types and densities. This change of plant composition would constitute an undesirable condition lessening the scientific and educational values of the ONAs and RNAs and having a moderately negative impact.

LAND USE

Recreation

Recreation designations, facilities and uses were evaluated to determine whether the proposed action would enhance or be detrimental to their present management objectives, recreation quality, and level of visitor use.

Designations

Gila Box Wild and Scenic River Study Area. The proposed action would highly benefit this study area. The immediate river area would be allowed to recover from heavy grazing, which would substantially improve the riparian habitat, increase the amount of wildlife--especially birdlife, improve scenic values, and return the Gila Box to a more primitive condition. Each of these benefits would enhance the area's value as a potential wild and scenic river.

Off-Road Vehicle Designations. For the construction and maintenance of range improvements an estimated 45 miles of "roads" would be established within areas proposed for off-road vehicle regulation. In view of the size of the ES area, this number of miles of established "roads" is small and would have a low negative impact on watershed and wildlife values, the protection of which is the purpose of the "regulated" designation. No new range improvement projects would be located in proposed "closed" areas.

Facilities

Visitor use at the recreation sites identified on map 2-25 is not expected to change appreciably due to proposed action. The aesthetic appeal of Bonita Creek 1, 2, 3, and 4, and the Gila Box access sites would be enhanced, but the aesthetic quantities of Aravaipa Canyon East Entrance, Spring Canyon and Old Clifton Bridge Recreation Sites would continue to deteriorate or remain the same.

Each existing and proposed recreation site was evaluated to determine whether livestock grazing would affect the site's vegetation cover, cause unpleasant and unsanitary conditions for visitors, or reduce visitor use. Loss of vegetation cover is a sign of site deterioration, whether caused by livestock or recreation use. Changes in vegetation cover affect the site's aesthetic appeal because bare ground, soil erosion, and an overgrowth of weeds are not visually appealing. The proposed action would not change recreation site condition.

Bonita Creek 1, 2, 3, and 4, Spring Canyon, and Old Clifton Bridge Recreation Sites. Livestock grazing on these sites has substantially reduced the understory vegetation and increased the amount of bare ground, reducing the sites' aesthetic appeal. Livestock trampling of the bare ground has powdered the soil and created excessive dust, which is undesirable for camping and picnicking. Deferment of livestock grazing for 3 to 5 years in Bonita Creek (grazing units 165, 166, and 167) would increase the understory vegetation, reduce the amount of bare ground and dust, and improve the aesthetic quality of Bonita Creek 1, 2, 3, and 4 recreation sites. The aesthetic qualities of Spring Canyon (grazing unit 166), and Old Clifton Bridge (grazing unit 7) recreation sites would not be improved by the proposed action because the amount of understory vegetation would not increase, the amount of bare ground would not decrease, and excessively dusty conditions would continue. Since all of the sites would be grazed, livestock excrement in the sites would cause unpleasant odors and attract flies. The presence of livestock would alarm some people and inhibit their leisurely enjoyment of the sites.

Lower Gila and Gila Box Access Sites. These proposed sites were evaluated to determine the effect of the proposed action upon their potential for development. Deferment of livestock grazing in the Gila Box (grazing units 3, 7, 16, 17, and 167) for 3 to 5 years would increase the vegetation cover, enhancing the site's aesthetic qualities. Yearlong grazing on the lower Gila River (grazing units 119, 120, and 121) would not change the sites' present quality. The sites' aesthetic values have deteriorated slightly from the loss of understory vegetation.

Livestock grazing on the sites, including the Gila Box, would continue after 3 to 5 years. After these sites are developed, the presence of livestock and their defecation would cause the same problems as occur on other recreation sites.

Recreation Uses, Use Areas, and Amounts

The proposed action was evaluated to determine whether it would beneficially or adversely affect the Recreation Information System (BLM Manual 6110) quality rating, recreation opportunity, or visitor use of each activity. The proposed action would have a slightly beneficial long-term impact (table 3-14). Changes in recreation quality, opportunities, and visitor use would be negligible except for hunting. The proposed action would moderately improve hunting quality and have a low beneficial impact upon hunting opportunities and visitor use.

Fishing. The proposed action would improve fishing quality in the Gila Box by deferring livestock grazing for 3 to 5 years and by reducing the sediment load in the Gila River. Deferment of grazing would increase the vegetation canopy, which would reduce critically high water temperatures. Implementation of AMPs would increase the ground cover, which would slightly reduce the sediment yield into the Gila River from all grazing units and improve the water quality of the fishery. The beneficial impacts, however, would be insufficient to change either the amount of visitor use or the present Class B fishing quality.

TABLE 3-14
LONG TERM IMPACTS ON RECREATION

	Quality	Oppor-tunity	Visitor Use	Percent
Fishing	L+	X	X	0
Hunting	M+	L+	L+*	+4%
Floatboating	X	X	0	0
Collecting - rocks/minerals	X	X	0	0
Sightseeing	L+	X	0	0
ORV Use	X	X	0	0
Camping	0	0	0	0
Picnicking	0	0	0	0
Primitive Use	L+	X	X	0

L - low, M - moderate, H - high. (+) beneficial impact, (-) adverse impact, (X) negligible impact, (0) no impact.

*Dependent upon Arizona Game and Fish Department issuing a commensurate increase in permits.

Hunting. The proposed action would improve wildlife habitat and improve hunting quality. The long-term impact would be positive.

Water Sports--Floatboating. Sediment yield from the grazing units into the Gila River would be reduced slightly but not enough to change the turbidity of the river to improve floatboating. Two to four new cross fences over the Gila River would create hazards for floatboaters. The fences, however, are in segments of the river only lightly used for recreation. The reduction in turbidity and presence of the fences would not change the present recreation quality classes identified in table 2-17 or change the amount of visitor use.

Collecting--Rocks and Minerals. Construction of new range improvements would adversely impact the Black Hills (grazing units 16 and 26) and Round Mountain (grazing unit 43) Rockhound Areas. The use of heavy equipment during construction and the related ground disturbance would break, fracture, and displace fire agate and chalcedony. The fences would obstruct the movement of rockhounds and would be considered a nuisance. Without proper fence-crossing devices rockhounds would break down fences in trying to cross them.

Construction of 1 mile of pipeline, one trough, one water storage tank, and 1 mile of fence would disturb approximately 2.25 acres within the Black Hills Rockhound Area. Approximately 0.25 acres would be lost to future collecting from placement of the troughs and storage tank. Placement of the trough is within 0.25 miles of the camping area and would cause a conflict of use between recreation and livestock management. Construction of 1.5 miles of fence would disturb approximately 1.5 acres in the Round Mountain Rockhound Area.

The disturbance of 3.75 acres would not significantly impact the present recreation quality of the rockhound areas (table 2-17) or affect the amount of visitor use.

Sightseeing. Deferment of livestock grazing for 3 to 5 years in the Gila Box (grazing units 3, 7, 16, 17, and 167) and Bonita Creek (grazing units 165, 166, and 167) would improve the wildlife habitat and increase the birdlife two to eight times (Carothers and Johnson, 1976), increasing the present sightseeing recreation value from Class B to Class A in 15 years. Data, however, were not available to calculate the present amount of sightseeing visitor use in these two areas or to project the extent to which visitor use would change.

Fishhook Canyon (grazing unit 151), Markham Canyon (grazing units 154 and 158), and Johnny Creek (grazing unit 165) would continue to be grazed. The density of the desirable riparian plants (willow, cottonwood, and sycamore) would not substantially increase, keeping the population of birdlife at its present level. The recreation quality rating of Class C (table 2-17) and the amount of visitor use would not change.

The opportunity to view livestock would decrease because of the proposed livestock reductions. Some grazing systems, such as rest rotation, would concentrate livestock, but even then the viewing of livestock would be infrequent because of the relatively small numbers of livestock and the large size of the grazing units. The reductions in livestock numbers would not change the present Class C recreation quality rating for the ES area.

Off--Road Vehicles (ORV). Construction of 3 miles of fence would restrict ORV use in a known ORV use area, the Jackson Mountain area, (map 2-22) by crossing two existing roads and approximately four dry washes.

Additional ORV use throughout the ES area, although presently low, would be restricted with the addition of 153 miles of fences. Moreover, fences designed to have low visibility would be hazardous to ORV users in this area.

The additional miles of fence would not change the present Class B recreation quality rating for ORVs or the present amount of visitor use.

Use Problems. Conflicts between livestock operators and recreationists would continue and be evidenced by open gates, cut fences, trespassing, scaring and chasing cattle, and shooting of livestock and range facilities. The proposed increase in fences, gates, and other facilities would result in increased vandalism, particularly as revegetation occurs.

Livestock Grazing

A review of past grazing use illustrates how overstocking the range occurred in the Safford District. During the late 1800s and until the passage of the Taylor Grazing Act (1934), there was little control over livestock grazing on public lands within the Safford District. Most of the ranges in the District were severely overstocked, and livestock grazed all available land. Many ranchers held the attitude that if their livestock did not graze the land, someone else's would. No government agencies controlled grazing, and ranchers paid no fees for the use of the land.

In 1936 the first adjudication (processing of applications and claims for livestock use of public lands) attempts were made. First consideration was given to livestock operators who could show control or prior use of water necessary to support livestock grazing on public lands. In most areas, the applications for livestock grazing exceeded the land's actual carrying capacity.

In 1935 and 1936 the Soil Conservation Service (SCS) conducted a range survey of the public lands. This survey was presented to the Safford District Advisory Board in February 1937. The Board recommended that the carrying capacity of the ranges in the District be set somewhat highter than the range survey indicated was proper. The Advisory Board's recommendations that correspond to SCS carrying capacities are shown in the following table.

SCS Survey CYL* per Section	(AC/AUM)	Corresponding Advisory Board Recommendation CYL per Section	(AC/AUM)
0 - 2	0 - 27	7	8
2 - 6	27 - 9	10	5
6 -12	9 - 4	12	4
13½ or more	4	Same as above	---

*Cattle yearlong: amount of forage needed to sustain a cow for 1 year.

On the vast majority of grazing units (see appendix B) the Advisory Board's recommendations were accepted, and overstocking has continued up to the present.

The proposed action would significantly affect livestock grazing in the ES area. Its implementation would reduce licensed grazing by 57,209 AUMs or an average of 33 percent on the grazing units within the ES area. These figures, however, exclude grazing units proposed for ephemeral management and units on which licensed grazing has been based on the public lands portion of the units only. The amount of grazing use that might be licensed on units proposed for ephemeral management cannot be predicted, nor can the amount of reduction in licensed grazing use in these areas. Table 3-15 presents an analysis of livestock grazing by proposed management system.

Grazing licenses on some units with small percentages of public lands have been based on the public lands portions only, and the amount of grazing occurring on the non-public lands in these units is not known. The present estimated grazing capacities, however, are based on all the lands within a grazing unit, and the change in livestock grazing that would result from the proposed action's implementation is not known for these units.

The proposed 57,209 AUM reduction in licensed livestock use would result in a short-term decrease in range livestock production for the grazing units within the ES area. Refer to appendix B for specifics by grazing units. Over the short term, stocking rates too heavy for the good of the range can produce greater livestock gains per acre and more income (Martin, 1975). Over time, however, such heavy stocking rates decrease the rangeland's productivity and decrease the range's ability to sustain grazing.

Within 15 years following the initial reduction in grazing, the ES area's carrying capacities are expected to increase by 14,237 AUMs or 12 percent as the rangelands improve toward their potentials (see appendix B). The units proposed for ephemeral management are excluded from this percentage for the reasons described above. Livestock production would also increase during the period.

TABLE 3-15
ANALYSIS OF LIVESTOCK GRAZING

GRAZING SYSTEM	AVERAGE PRESENT LICENSED USE TOTAL AUMs 1/	PROPOSED USE TOTAL AUMs 2/	ESTIMATED AVAILABLE LIVESTOCK AUMs IN 15 YEARS 3/
Rest Rotation 13 grazing units 19% of ES area within grazing units	32,690	19,198	21,439
Santa Rita System 25 grazing units 20% of ES area within grazing units	50,873	24,923	28,749
Deferred Rotation 8 grazing units 6% of ES area within grazing units	37,027	30,525	33,554
Yearlong Grazing 24 grazing units 18% of ES area within grazing units	26,599	17,906	20,799
Seasonal Grazing 17 grazing units 8% of ES area wtihin grazing units	19,856	18,158	20,406
Custodial Management 33 grazing units 11% of ES area within grazing units	5,025	3,989	3,989
Ephemeral Management 65 grazing units 16% of ES area within grazing units	---	Ephemeral	Ephemeral
Deferment of Grazing Use 1% of ES area within grazing units	0	---	---
Unallocation of Grazing Use 1% of ES area within grazing units	0	162	162
TOTAL	172,070	114,861	129,098

1/ Average of past 5 years licensed use including State and private lands where such use occurred in conjunction with use of the public lands.
2/ Adjustment to carrying capacity, including State and private lands where such use would continue in conjunction with public lands.
3/ Although production is expected to increase as shown above, BLM would not be committed to any additional livestock use.

The proposed stocking rates would generally allow more forage for each grazing animal. In addition, as range conditions improve, livestock would have access to a larger proportion of desirable forage species. These factors would provide a greater opportunity for increased weight gains, increased calf crop percentages, and reduced death losses from nutrition problems. The proposed action would thus provide more opportunities for improved livestock performance, which could increase livestock production.

Intensive management calls for grazing systems requiring livestock to be moved regularly, compelling livestock to acclimate to new terrain and water sources. The acclimation process could have a short-term effect on livestock performance, causing a decrease in weight gain. Rotation grazing systems, however, have been shown to improve livestock performance (Waldrip, Parker, and Marion, 1967; and Merrill, 1954). Over the long term, livestock performance can be expected to improve as range conditions improve and livestock become accustomed to being moved regularly. Under the proposed grazing program the following average benefits are expected: calf crop + 10.8 percent, calf weened weights + 48 pounds, cull cow weights + 40 pounds, and death loss -3.7 percent (table 3-16).

Operating the proposed intensively managed grazing systems would require more time and effort than would yearlong grazing. Many of the licensees that manage their units on a part-time basis would probably not have the additional labor. Obtaining more labor would represent an additional expense. Furthermore, laborers with the necessary experience are relatively scarce. On the other hand, by having to spend more time supervising livestock operations, licensees could better observe and care for their livestock.

Under rotational grazing systems, the resting of portions of a grazing unit would concentrate cattle on the grazed portions. Water sources would be more heavily used, and cattle would have a greater tendency to attempt escaping through fences, requiring more maintenance of fences and water sources. Furthermore, the construction of range improvements needed to implement these grazing systems would require additional maintenance effort from the licensees.

Thirteen of the proposed grazing systems would be operated on grazing units formed by combining several existing allotments. Combining existing allotments would significantly alter the present pattern of use, having both beneficial and adverse impacts.

On the beneficial side, small allotments often do not lend themselves to multiple pastures, and an effective grazing system could well be operated by combining several allotments into a unit. Moreover, in most cases fewer range improvements would be required on such combined

INTENSIVE MANAGEMENT BENEFITS TO LIVESTOCK PERFORMANCE+

Grazing Unit No.	Increase % Calf Crop	Increase Calf Weights (lbs)	Decrease Animal Death Rate (%)	Increase Cull Cow Weights (lbs)
19	10	100	0	10
183	5	25	4	25
182	5	25	4	75
181	10	50	4	25
180	15	100	4	25
168	15	75	4	25
167	15	50	4	75
164	5	50	4	15
163	12	40	4	25
158	15	50	4	50
152	20	50	4	50
146	5	25	4	25
139	15	50	4	50
135	10	20	4	25
134	0	25	2	60
132	15	0	4	50
130	10	50	4	50
123	25	25	4	25
121	15	25	4	40
120	20	50	4	25
119	5	50	2	25
118	5	50	4	50
117	15	50	3	50
114	15	50	4	50
90	10	40	2	75
88	10	50	4	50
85	5	25	2	50
83	5	15	4	50
81	10	50	2	25
80	10	50	2	0
78	5	25	2	40
75	10	50	4	50
74	5	50	4	50
73	5	50	4	75
72	14	50	4	40
71	10	50	4	50
69	4	50	4	50
63	10	50	4	50
57	10	25	4	50
56	10	50	4	50
55	5	25	4	50
54	0	50	4	45
52	*	*	2	*
49	28	75	8	50
48	10	25	4	50
45	5	50	4	50
44	10	40	4	25
43	10	25	3	25
36	5	40	4	25
34	10	50	4	50
32	10	100	4	50
31	5	100	4	50
30	25	100	4	25
28	5	25	4	50
27	5	50	4	50
26	10	50	4	50
22	5	25	4	30
21	15	100	4	25
18	25	70	4	50
17	20	50	4	25
16	20	100	4	25
14	5	50	4	40
13	25	50	2	50
12	20	50	2	50
9	5	40	4	50
8	5	25	4	25
6	5	50	4	25
5	10	25	4	25
2	10	25	4	25

+Anticipated to occur within 15 years after implementation of proposal.
*Operations raising only heifers for breeders.
Source: Safford District AMPs.

allotments. On the other hand, separating cattle belonging to several licensees while gathering or branding would be difficult and time consuming. Licensees would have to agree on dates for gathering and branding and would have to share operating and maintenance expenses.

Implementation of ephemeral management would significantly affect the livestock operations on the grazing units involved. Under ephemeral management, livestock grazing would be licensed for unpredictable amounts of time only during periods of favorable climate. Purchasing cattle on short notice, holding them for a short time, and then selling them would generally not be feasible. The licensee, rather, would have to maintain a continuous livestock operation on lands located elsewhere, such as irrigated lands or other ranching units. Where other grazing lands are not available, the licensee would have difficulty maintaining an economically feasible livestock operation on a unit proposed for ephemeral management.

Deferment of livestock use in the critical watershed areas along the San Simon River would have little effect on livestock production, since these lands presently support little grazing. Deferment of livestock grazing in the 5,250 acres of proposed riparian habitats, however, would alter the existing pattern of grazing on the units involved. These riparian areas would be fenced, eliminating their continuous use for grazing and as water sources. They then could not be grazed for a few years, which would result in a loss of 292 AUMs and a short-term decrease in livestock production. Cattle grazing on upland areas near these water courses would be strongly attracted by the area's lush forage, shade, and water. They could drift against the fences, requiring the licensee to drive the cattle away to other water sources.

Implementation of custodial management would have little impact on livestock grazing except for the effects of the proposed reduction in licensed grazing use.

Construction of the three proposed detention dams would benefit livestock production. Restoration of the forage production potential of the areas upstream from the proposed structures would increase livestock forage from 4,000 to 8,000 AUMs.

ECONOMIC AND SOCIAL CONDITIONS

Summary

The proposed action would have an overall low impact on the general economy of the ES area. Earnings for the area would be increased slightly. Greater recreation opportunities would generate small additional revenues as would the construction of range improvements. Local governments would lose some Taylor Grazing Act payments as well as property taxes paid on cattle. Some temporary employment would be created in the construction sector.

Possibly high adverse economic impacts are expected initially on 20 grazing units proposed for ephemeral management and 21 grazing units proposed for intensive management. Within 15 years after implementation of the proposed action, however, the number of grazing units expected to be highly impacted would drop to 19. The proposed action's impact on the 14 grazing units whose average licensed use data are based only on public lands cannot be estimated.

This section quantifies impacts for the general economy, including recreation, construction, local governments, and employment. Significance of impact is based on the quantified data, including absolute amounts and percentages. Some information, such as ranch income lost, cannot be quantified because of a lack of specific financial data. Moreover, because data are not available for particular range users, certain assumptions were made to determine the significance of impact on the range user. These assumptions are stated in the discussion of the livestock industry.

Population

Impacts of the proposed action on the ES area's population are expected to be minor. If the 41 ranches expected to undergo heavy adverse impacts were to fail and the ranchers were to move outside the ES area, the area's population would decline by about 0.2 percent. This hypothetical situation does not suggest that these ranches would fail, or that ranchers would move if they did. It merely shows the relatively minor impact to the population of the area.

ES Area Earnings

Initially allottees and licensees in the ES area would lose 57,209 AUMs of forage, having an estimated value of $470,000, including direct and indirect income. This AUM loss, however, is based on the assumption that the present level of production could be maintained. These reductions are expected to decrease by 14,237 AUMs within 15 years as the range's grazing capacity increases. Along with this increase, additional returns could be expected through increased percentage calf crop, weaning weights, and cull cow weights, reduced death loss, and decreased fixed and variable costs.

According to cost-return evaluation of proper range use in the Chino Winds Soil Conservation District (Arizona Inter-Agency Range Committee 1972, 1973) net returns per AUM could be increased 115 percent with comparable cuts in grazing and increases in production. If this relationship were applied across the board for the ES area, the proposed action over a 50-year period has the potential for increasing average annual income by approximately $407,000 above present income, including direct and indirect income. This application does not consider economies of scale, which may vary with ranch size. The stated increase was based on a 400-head breeding herd. This figure does not reflect an analysis of the individual rancher's situation but is an overall estimate meant to show that the impacts might be less severe than those perceived.

Recreation

Improvements in recreation opportunities accompanying implementation of the proposed AMPs are expected to generate an average annual income of about $2,300 per year. This income is expected to flow into ES area's local economies.

Construction

The construction industry would be beneficially impacted by the implementation of the proposed action. During the initial period of range improvement construction, BLM would invest $784,100 (1976 dollars), and range users would invest $185,200 for a total of $969,300 The income multiplier for the construction industry is 1.040. The construction multiplier is taken from the three-county area but is considered applicable to the entire ES area. Total income impact from construction during the period of construction would therefore be about $1,008,100.

Local Government

Reductions in livestock grazing would lower the incomes of local governments by reducing the county tax bases and reducing Federal Government payments under the Taylor Grazing Act. Initially the reduction of 57,209 AUMs would reduce revenue by an estimated $10,300 as provided for in the Taylor Grazing Act. A subsequent increase of 16,365 AUMs over a 15-year period, however, would ameliorate the loss. Over a 50-year period the annual loss would average $8,600, $4,600 for school funds, and $4,000 for range improvements.

Property taxes paid by ranchers for cattle would also decrease if ranchers are unable to compensate for the reduction in AUMs on public lands. The counties would initailly lose about $11,100, but this loss would decrease as grazing capacities increase over 15 years. Over a

50-year period the estimated annual loss would amount to $9,300. These losses reflect 1978 tax values per head, which have increased by about 21 percent over 1975 values. Estimated values were derived from three-county averages, assumed to approximate those of the entire ES area.

The initial reduction to carrying capacity is expected to decrease ranch values by about $6,674,000. The increase in the range's grazing capacity would partially restore values. The average value lost over a 50-year period would be an estimated $5,580,000. This loss in value could potentially reduce the borrowing capacity of the ranch holding or sale value of the ranch or both. Although these reductions are conceptualized as paper value, their effects might be very real.

Employment

Completion of the proposed range improvements would require approximately 277 man-months of construction labor. If this construction were to occur in 1 year, 23 jobs would be created, which would amount to less than 2 percent of the the construction industry employment in the ES area. Employment in the construction of range improvements would likely occur over an extended period as AMPs are funded by congressional appropriations. Such construction could reduce unemployment in the local area, although specialized skills might be obtained from outside the ES area.

Reduction of grazing could result in ranchers having to eliminate part of their seasonal or full-time hired help. How much help would have to be released, however, is not known. Some ranchers might want to supplement their ranch income with part-time jobs. Both situations could result in more competition for available jobs.

Livestock Industry

The initial reduction of grazing to carrying capacity would have an adverse financial impact on many of the allottees. The extent of the impact on the individual allottee would depend on the economies of his ranch, alternative options, and his financial condition. An estimate of the impacts can be discerned from appendix B, showing the percent reduction by grazing unit. Initially the average licensed use from 1972 to 1976 would decline by 33 percent. This percentage, however, omits grazing units under ephemeral management and units on which licensed use is based only on public lands and on which total grazing capacity is unknown. Within 15 years after implementation of the proposed action and reduction to carrying capacity, carrying capacity would increase to within 25 percent of the initial average licensed use. In addition, the 69 grazing units under intensive management would accrue advantages from weight gains, reductions in death loss, and percentage increases in calf crop.

During this period of increasing carrying capacity following initial reduction, certain allottees might suffer substantial adverse financial impacts. Others, who had originally operated at or near carrying capacity, would suffer little or no adverse impact.

A total of 33 allotees would have to reduce cattle grazing on public lands by more than 50 percent, 31 by 26 to 50 percent, and 12 by 1 to 25 percent. Thirty-six grazing units would have no reduction. Of the 193 grazing units, 14 percent or 27 are operated by full-time ranchers.

Impacts on the individual rancher can better be seen by examining separately the five proposed categories into which the ES area's grazing units would fall: custodial (33 units), ephemeral (65 units), intensive (73 units), unallocated-unused (8 units), and grazing units on which 5-year licensed use data are based on the grazing capacity of the public lands only (see appendix B, footnote 3) (14 units). Many grazing units however, are currently managed differently from their proposed management.

Under the proposed action, 33 grazing units would be classed as custodial. These units have small areas of often widely scattered public lands, the carrying capacity for which BLM charges an AUM fee. The proposed action would have no financial impact on permitttees of custodial grazing units. The management of over 90 percent of these units would not change, and those permittees on grazing units changing to custodial management would not have to reduce livestock numbers. Five of these units are operated by full-time ranchers.

Of the 65 grazing units proposed for ephemeral management, 26 or 40 percent are already so classed and would not be impacted. Moreover, some of the 39 remaining grazing units have been managed as ephemeral range although not so classed. In such cases permittees have grazed cattle only when ephemeral forage was present but continued to pay the AUM fee to preserve their grazing rights. Table 3-17 shows the average licensed use for these 39 grazing units. The herd size on 20 grazing units exceeds 200 head yearlong, and on 15 grazing units exceeds 300 head. Grazing units grazed by herds larger than 200 head would be highly impacted by the proposed action. Only one of these units is operated by a full-time rancher.

The proposed action calls for the intensive management of 73 grazing units under AMPs. On 65 of these units grazing would initially be reduced to carrying capacity; on the remaining 8 the amount of AUMs for livestock would be permitted to increase.

Fifteen years after implementation of the proposed action, range condition would improve to the point that only 57 intensively managed grazing units would have undergone an absolute reduction in AUMs, whereas 16 intensively managed grazing units would have experienced an absolute increase in AUMs.

TABLE 3-17
AVERAGE LICENSED USE OF GRAZING UNITS
PROPOSED FOR EPHEMERAL MANAGEMENT

AUMs	Number of Grazing Units
0- 99	10
100- 199	9
200- 299	5
300- 399	1
400- 499	5
500- 599	3
600- 699	0
700- 799	0
800- 899	1
900- 999	0
1000-1099	0
1100-1199	0
1200-1299	1
1300-1399	0
1400-1499	1
1500-1599	1
1600-1699	0
1700-1799	2
Total	39

Table 3-18 shows these changes by initial herd size at implementation, and table 3-19 shows these changes 15 years thereafter. The broken line through the tables divides the 300 animal unit economic size from smaller herds. All grazing units having more than 300 head are expected to suffer adverse financial impacts from their proposed reductions in AUMs. Additionally those full-time ranchers that have herds of less than 300 head would also suffer adverse impacts with a reduction in AUMs.

Initally, 21 grazing units would be adversely impacted under the above criteria. After 15 years, 19 grazing units would be adversely impacted. These figures, however, can only be estimates because full financial data on grazing units are not known nor are other sources of family income.

Thirteen full-time ranchers would initially be impacted. Twelve of these would lose AUMs under the proposed action, and one would gain AUMs. After 15 years 10 ranchers would continue to lose AUMs and 3 would gain AUMs.

Fourteen additional grazing units proposed for intensive management have their average licensed use based on the grazing of public lands portions of the grazing unit rather than all the land within it. Because of the lack of data on the non-public lands portions, the percent reduction in AUMs cannot be calculated. Eight full-time ranchers are in this category.

The severity of the financial impacts on these intensive management grazing units would be lessened by improved calf-crop percentages, calf weights, cull cow weights, and reduced animal death rates expected to result from AMP legislation (table 3-16). In some cases their financial position may even be improved. Under AMPs, calf crops are expected to increase by an average of 10.8 percent, and calf weights by an average of 48 pounds. Cull cow weights are expected to increase by an average of 40 pounds, and animal death losses are expected to decrease by 3.7 percent. The ranch income that would accrue cannot be calculated for a lack of specific data, but such benefiits are expected to be substantial.

Certain individuals in the ES area license more than one grazing unit (table 3-20). Others hold grazing units in association with other individuals, often family members. There are 15 additional grazing units in various combinations. Impacts on individuals from the reduction or increase of AUMs on multiholdings could thus be greater than those for single holdings.

A ranching operation's return to operator, to labor, to management, and to capital depends, among other factors, upon the market price for cattle when sold, the size of the herd, and the manager's skill. The

TABLE 3-18

GRAZING UNITS FACING INITIAL REDUCTIONS AND INCREASES IN AUMS

Grazing Unit Size by Animal Units	Animal Unit Months Lost or Gained														
	1-199	200-399	400-599	600-799	800-999	1000-1199	1200-1399	1400-1599	1600-1799	1800-1999	2000-2199	2200-2399	3800-3999	4000-4199	4600-4799	TOTAL
1-99	9#,3*	11#	1,1*	3												24,4*
100-199	2,1*	1	4#	4	2	3#	2#									18,1*
200-299	1#,1*	1	1,1*	1#	2	1	2		1#							10,2*
300-399	1*#		1	1#		1			1	1						5,1*
400-499									1			1				2
500-599											1#		1#	1		3
600-699															1	1
900-999							1									1
2100-2199								1#								1
Total	12,6*	13	7,2*	9	4	5	5	1	3	1	1	1	1	1	1	65,8*

*Grazing units having proposed initial increases in AUMs. Other numbers represent grazing units whose AUMs would be decreased.

#One grazing unit operated by full-time rancher.

TABLE 3-19
GRAZING UNITS FACING FUTURE (15-YEAR) REDUCTIONS AND INCREASES IN AUMS

Grazing Unit Size by Animal Units	Animal Unit Months Lost or Gained													
	1-199	200-399	400-599	600-799	800-999	1000-1199	1200-1399	1400-1599	1600-1799	1800-1999	3400-3599	3600-3799	3800-3999	TOTAL
1-99	15##,6*	3	2,1*	1										21, 7*
100-199	2*	4#,1*	5	1	3	3##								16, 3*
200-299	1,3*#		1#	2,1*	2	1		1#						8, 4*
300-399		1,1*#	2#				1		1					5, 1*
400-499							1			1				2
500-599										1#	1	1#		3
600-699													1	1
900-999						1								1
2100-2199					1*#									1*
Total	16,11*	8,2*	10,1*	4,1*	5,1*	5	2	1	1	2	1	1	1	57,16*

*Grazing units expected to have future increases in AUMs. Other numbers represent grazing units whose AUMs would be decreased over initial AUMs but would remain the same or increase after initial reduction.

#One grazing unit operated by full-time rancher.

TABLE 3-20
MULTIPLE HOLDINGS OF ES-AREA PERMITTEES

Grazing Units in Multiple Holdings	Type of Management	Average 5-Year Carrying Capacity (AUMs)	Carrying Capacity (AUMs)	AUMs Apportioned to Wildlife	Percentage Reduction to Carrying Capacity
1	Custodial	300*	300**	---	0
168	Intensive (Proposed AMP)	3,360	2,522	62	27
15	Intensive (Proposed AMP)	133*	305	1	0
36	Intensive (Proposed AMP)	3,744	2,712	17	34
17	Intensive (Proposed revision of Implemented AMP)	1,707	1,211	35	37
26	Intensive (Proposed AMP)	1,774	568	28	54
58	Intensive (Proposed revision of Implemented AMP)	1,794	973	1	46
61	Ephemeral (Classified)	7	Ephemeral	---	---
73	Intensive (Proposed AMP)	1,961	615	85	73
62	Intensive (Implemented AMP)	2,957	2,400	---	19
66	Ephemeral (Proposed)	1,422	Ephemeral	---	---
79	Ephemeral (Proposed)	1,200	Ephemeral	---	---
99	Ephemeral (Proposed)	14	Ephemeral	---	---
67	Custodial	12*	4**	---	67
85	Intensive (Proposed AMP)	99	108	---	0
76	Custodial	36*	36**	---	0
83	Intensive (Proposed AMP)	988	1,097	101	0
177	Custodial	19	19	---	0
179	Custodial	120	60	---	50
182	Intensive (Proposed AMP)	1,279	587	107	62
193	Ephemeral (Classified)	12	Ephemeral	---	---
187	Ephemeral (Classified)	121	Ephemeral	---	---
189	Ephemeral (Classified)	0	Ephemeral	---	---

*These AUMs are based on the licensed use of only the public lands within the grazing unit boundary.

**These AUMs are based on the estimated grazing capacity of only the public lands within the grazing unit boundary.

price received by ranchers for livestock varies greatly from year to year or even more frequently. According to the U.S. Department of Agriculture, Economic Research Service (1974) (table 3-21), in 1964 the average southwest cattle ranch suffered a loss, whereas 1972 was a particularly profitable year. Operating under pure competition, the cattle rancher has little or no control over beef prices. He can hold cattle from the market to await a more favorable price, but he risks an even lower price. Or the rancher may be forced to sell because of an immediate need for cash. Although the proposed action would not affect the price of beef, the price of beef is discussed because of its effect on return.

A second factor influencing return to ranchers--herd size--would be impacted by the proposed action (Martin and Goss, 1962). A ranch twice the size of another will often earn more than twice the smaller's return because of economies of scale. Economies of scale allow the larger operator to achieve certain efficiencies that the small operator cannot, thus giving the larger operator smaller operating costs per unit.

By making many operators smaller, the proposed action would also tend to make them less cost efficient. In southeastern Arizona, the operating costs per unit of livestock for a 100- and 200-head herd of cattle are 1.35 and 1.05 times respectively the cost of operating a 300-head herd (computed from Dickerman and Martin, 1967).

Closely related to these economies of scale is the density of cattle on the range. As grazing capacity is achieved under the proposed action and the number of cattle per unit area decreases, costs per unit area would increase.

The proposed action would not directly affect the skill of the ranch manager, but it might hinder a poor manager in making any return.

Attitudes and Values

How the proposed action would influence rancher values and attitudes would depend to some extent upon the degree of financial hardship imposed. The ranchers' choice of occupation or adherence to ranch fundamentalism is not expected to change, a contention reinforced by the estimate that more than 50 percent of the ranchers are over 45 years old. People of this age group could not change occupations without great difficulty.

The proposed action is expected to reinforce income satisficing, especially among ranchers forced to live on less income but reluctant to quit ranching because of community ties, lack of occupational alternatives, or personal choice. Some ranchers might wish to supplement their ranch incomes on the outside, creating greater competition in the labor market.

TABLE 3-21

SOUTHWEST CATTLE RANCHES: SUMMARY OF INVESTMENTS, COSTS, AND RETURNS PER RANCH, 1964-72 1/

ITEMS	1964	1965	1966	1967	1968	1969	1970	1971	1972
					NUMBER				
Livestock on ranch:									
All cattle	387	393	393	387	392	393	395	387	397
Brood cows and heifers	304	301	289	300	304	309	277	279	275
					DOLLARS				
Total ranch capital, Jan. 1.	364,230	369,480	409,900	464,390	481,280	519,620	525,970	544,040	556,730
Land	243,840	254,000	281,940	281,940	343,140	363,780	368,940	374,100	379,260
Buildings and improvements	60,640	62,150	64,900	66,850	68,750	70,670	71,500	72,200	73,200
Livestock	49,650	43,050	52,570	56,400	58,202	73,320	73,150	85,590	91,460
Machinery and equipment	10,100	10,280	10,490	10,940	11,370	11,850	12,380	12,150	12,810
Total cash receipts	20,402	31,512	32,348	30,031	33,636	39,602	35,589	37,611	40,228
Calves	12,100	15,895	19,006	18,966	20,923	19,869	18,126	19,350	31,429
Steers and heifers	2,268	7,208	5,869	4,320	5,515	4,776	10,424	7,405	3,402
Cows and bulls	6,034	8,409	7,473	6,745	7,198	14,957	7,039	10,856	5,397
Value of perquisites	1,188	1,286	1,527	1,415	1,485	1,772	1,791	2,035	2,483
Change in inventory	162	-272	213	1,186	294	-1,848	-788	1,040	11,900
Gross ranch income	21,752	32,526	34,088	32,632	35,415	39,526	36,592	40,686	54,611
Total operating expenses	22,935	23,749	23,359	23,868	25,137	27,352	26,562	29,899	29,009
Feed and grazing fees	8,277	7,352	7,489	7,451	6,779	7,734	9,262	11,490	9,191
Other livestock expenses	3,038	4,383	3,137	2,916	4,091	4,558	2,188	2,633	3,335
Machinery expense	3,879	3,957	4,079	4,262	4,461	4,570	4,714	4,750	4,861
Buildings and fences	1,762	1,797	1,872	1,929	1,983	2,028	2,065	2,073	2,094
Property taxes	1,549	1,583	1,790	2,041	2,034	2,062	2,097	2,187	2,269
Hired labor	3,141	3,350	3,600	3,812	4,286	4,821	4,821	5,148	5,540
Other expenses	1,289	1,327	1,392	1,457	1,503	1,579	1,570	1,618	1,719
Return to operator--labor, management and total capital	-1,183	8,777	10,729	8,764	10,278	12,174	10,030	10,787	25,602

1/ Preliminary Source: U.S. Department of Agriculture, Economic Research Service, 1974.

Increased speculation or conspicuous consumption might result from ranchers being forced out of business. Individual ranchers or groups of ranchers might buy the ranches of those forced to quit ranching. The extent of this impact, however, is not known.

Community ties would not be expected to change. The impact of having to leave the area might be particularly traumatic on ranchers having strong community ties.

The proposed action is expected to increase rancher stress, especially where the ramifications of the action are unknown. Ranchers are expected to perceive changes in income and status with alarm. A combination of all the factors discussed previously is expected to increase ranching cohesiveness, which may be manifest in organizing to resist reductions. Such action might come through formal organizations, such as the Cattle Growers Association or the Farm Bureau.

The community can be expected to strongly support the ranchers. This support would emanate from the well informed as well as from the less well informed with strong emotional ties. In general, the proposed action is expected to increase negative attitudes toward government.

CHAPTER 4

MITIGATION

4

CHAPTER 4

MITIGATION

The mitigating measures in table 4-1, in addition to those included as part of the proposed action, will be used to reduce or eliminate adverse impacts of the proposed action should it be adopted. These mitigating measures meet the criteria of being real, committed, and enforceable.

TABLE 4-1
MITIGATING MEASURES

Resources Impacted	Mitigating Measures	Changes due to Mitigation
Soils and Vegetation	Disturbed areas around detention dams will be contour ripped to a depth of 12 inches.	Effects of soil compaction will be eliminated by increasing infiltration rate by 50% and reducing both runoff and soil erosion by 25%.
	If the areas upstream from the 3 detention dams do not revegetate or are invaded by obnoxious, noxious or poisonous plants, the areas will be sprayed, seeded, or both.	Spraying will be 80% effective in controlling weed species. Seeding will increase ground cover and infiltration and will reduce runoff and erosion.
Livestock Grazing	In the 13 combined grazing units, BLM will encourage licensees to reach agreements on compatible range operations and breeds, and kinds and grades of livestock. If agreements cannot be reached, the District Manager will assess the conflict(s) and issue a decision specifying breed and grade of bulls, kinds of livestock, season of use, and range improvement maintenance responsibility.	Conflicts between licensees on combined grazing units will be eliminated either by agreement or decision.
Wildlife	A wildlife biologist will be involved in the finite location, time of construction and construction stipulations in all proposed projects.	Wildlife will be only minimally disturbed. In some cases wildlife impacts will be completely eliminated.
	During periods of drought special measures, such as livestock reduction or removal, will be considered.	The removal or reduction of livestock grazing during drought periods will greatly benefit wildlife populations and habitat by ensuring that wildlife will be able to use the existing forage, cover, and water. If the resource manager does not implement the livestock reduction or removal, wildlife values will not benefit.
	Funds will be requested for studies to determine the biological needs of the white-tailed deer.	Studies will provide information to determine the opportunities for management of the white-tailed deer herd.
	Areas of competition between desert bighorn sheep and livestock in Aravaipa Canyon will be identified and livestock will be removed.	Livestock-desert bighorn sheep competition in Aravaipa Canyon will be eliminated on public land.
	During the final stages of AMP implementation, special attention will be given to riparian habitat. Where physically possible riparian habitat will be fenced and managed principally for its wildlife and recreational values.	Riparian habitat will be recognized for its values as crucial wildlife habitat and for its recreational diversity.
Natural History	6.5 miles of fence will be built to exclude livestock from 655 acres of paleontological sites, Nos. P-1, P-5, and P-15 (table 2-12). These sites are suitable for inclusion in the National Natural Landmarks Program.	Fencing will eliminate trampling of fossils, improve vegetation vigor, and reduce sheet erosion on sites by 20%. Fencing will cause the loss of 10 AUMs and the short-term ground disturbance of 10 acres. Fencing will restrict and create hazards for ORV use.
Cultural	Cultural resource stipulations will be included in all grazing leases and permits. These stipulations will require that the leasee or allottee not injure, alter, destroy, or collect any article of cultural or scientific importance and that he immediately notify BLM of any discovery, alteration, or destruction of these resources.	A 20% reduction of these impacts is anticipated.
	Cultural resource reports and recommendations included in the AMPs will be updated to include new sites discovered, present impacts, and required mitigation as determined through inventories and monitoring.	A 20% reduction of impacts is anticipated with grazing plan adjustments and site-specific protection measures.
Primitive Areas	Proposed primitive areas will be reevaluated, and AMPs will be modified to include primitive area management objectives.	Primitive values will be preserved and evidence of man's intrusion will be minimized.
Natural Areas	The 6 proposed outstanding natural areas (ONAs) and 4 proposed research natural areas (RNAs) will be inventoried, designated, and managed if they possess unusual natural characteristics. For designated areas, AMPs will be altered to include ONA and RNA objectives. These objectives will take precedence over grazing management objectives.	On designated areas, natural conditions and characteristics will be retained or enhanced. 33 miles of fence may be required which would temporarily disturb 33 acres. 5 to 10 livestock water facilities may have to be relocated. Such fencing will eliminate 2,705 AUMs annually.
Recreation	1 mile of pipeline, 1 trough, and 1 water storage tank proposed within the Black Hills Rockhound Area will be relocated.	A conflict between campers and cattle will be eliminated. Relocation will prevent the loss of ½ acre class B rockhound area.
	1½ miles of proposed fence in the Round Mountain Rockhound Area will be modified to provide 2-people walk-throughs and 2 cattleguards.	The proposed fence with walk-through will create a minimal obstacle to rockhounds. The cattleguards will provide easy access where the fence crosses the existing roads.
	Fence posts in ORV-use areas will be located for maximum visibility and painted in readily visible colors.	The hazard of ORVs hitting fences will be minimized.
	Cattleguards will be installed on all heavily used public access roads leading to established recreation areas.	The problem of gates being left open will be eliminated.
	The public education program will be amplified.	Program will help mitigate rancher-recreation problems: shooting of livestock and range improvements, trespassing, and the scaring and chasing of livestock.

CHAPTER 5

UNAVOIDABLE ADVERSE IMPACTS

CHAPTER 5

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are those impacts discussed in chapter 3 that would not be mitigated by the measures listed in chapter 4. Such impacts are often referred to as "residual" impacts. They are unavoidable mainly because either (1) the proposed action directly conflicts with another value or values or (2) the cost of mitigation would be prohibitively high.

SOILS AND VEGETATION

The proposed action would have both long- and short-term unavoidable impacts on soils. The short-term impacts would include soil compaction and erosion. In the short term, projects would disturb 739 acres and increase sediment yield from 0.52 to 2.5 acre-feet per year. Long-term impacts would involve 362 acres occupied and disturbed by proposed projects: 225 acres from roads and trails, 50 acres from detention dams, and 87 acres from other range improvements.

The proposed action would also have long- and short-term unavoidable adverse impacts on vegetation. For example, the grazing of green growing plants would interrupt plant development for a short time. Over the long term, the proposed action would remove 362 acres from production.

ANIMALS

Some impacts associated with proposed livestock grazing management would remain, although certain wildlife species would be affected more than others. Impacts would be magnified when grazing occurs during the drought and other periods of low range productivity and as use of vegetation exceeds 40 percent. Because of their locations and the time and amount of rest provided, certain deferred and seasonal grazing systems appear to impact wildlife more than others.

Livestock trampling would result in minor wildlife losses, particularly under high-intensity grazing. Most losses would occur near livestock concentration areas, such as watering facilities, and during the spring and summer reproductive period when young animals are present. Overall deaths from trampling, however, are expected to be low.

Although adverse impacts inherent with the proposed livestock grazing program would remain, conditions for most wildlife would be improved over those of the past. All adverse impacts associated with livestock grazing could be eliminated by the termination of grazing.

Minor unavoidable short-term impacts would result from the construction of proposed projects, which include fences and water developments. Construction operations would kill a small number of animals and alter or disturb small amounts of habitat. Long-term benefits to wildlife resulting from the construction of proposed projects, however, are expected to more than offset short-term losses.

Table 5-1 summarizes unavoidable adverse impacts of the proposed action. Impact categories are explained in the following section.

Category 1

Category 1 deals with impacts on wildlife habitat, primarily as a result of livestock grazing during continuing drought and periods of low productivity. Severity under proposed management would depend upon the length of the drought. With use of vegetation continually high, resource management objectives would not be met. If further adjustments and special considerations are not invoked during these periods the impacts indicated in table 5-1 would result.

Category 2

Category 2 impacts are those associated with moderate grazing (as intended by the proposed action), forming the basis for anticipated improvement in range and wildlife habitat condition. Moderate livestock grazing is the key to the success of practically the entire proposed action.

Category 3

As a result of past actions and the proposed action, the majority of riverine habitat would be protected by fencing, creating highly desirable habitat conditions in these areas (map 3-1) and benefiting many wildlife species. Riverine areas not proposed for fencing would maintain the present poor condition or improve only slightly as a result of overall reductions in grazing pressure.

Categories 4, 5, and 6

Impacts associated with these categories are expected to be adverse to small numbers of individual animals but are not expected to affect significantly the populations of the ES area. Cumulative effects linked to these impacts are considered in overall impacts (category 7).

Category 7

Category 7 includes overall residual impacts. Categories 1 and 3, however, are omitted. Impacts associated with category 1 are not acceptable and would not allow or would severely curtail the reaching of resource objectives. Category 1 impacts would require the application of specific mitigation, such as temporary reductions in livestock numbers during the impact period or further reductions in base herds.

TABLE 5-1

UNAVOIDABLE ADVERSE IMPACTS OF THE PROPOSED ACTION
ON SELECTED AND REPRESENTATIVE SPECIES OF WILDLIFE
(A SUMMARY)

Wildlife (Affected)	IMPACT CATEGORIES						
	1. Livestock grazing during periods of low-range productivity--use attains the upper limit of 60% in consecutive years.	2. Competition for food and cover--use averages 40% but does not attain 60% in consecutive years.	3. Impacts in aquatic/riparian areas not proposed for fencing. (Local impact)	4. Trampling by livestock resulting in death of animals.	5. Construction of water projects. (Short term)	6. Construction of fence projects. (Short term)	7. Overall residual impact excluding categories 1. and 3.
Black bear	2	7	2-3	NA	9	9	7
Mountain lion	1-2	7	2-3	NA	9	9	7
Javelina	1-2	6	2-3	NA	9	9	6
Elk	2	6-7	2	NA	NA	NA	6-7
Mule deer	1-2	5-6	2-3	NA	9	9	5-6
White-tailed deer	1-2	5	2-3	NA	9	9	5
Antelope	1-2	6	NA	NA	9	9	6*
Black-tailed jackrabbit	2-3	6-7	NA	8	9	9	6-7
Desert cottontail	1-2	4-5	2-3	8	9	9	4-5
Rock squirrel	2	7	7	7	9	9	7
Harris' antelope ground squirrel	2	7	7	7	9	9	7
Pocket mice	2-4	2-6	7	7	9	9	2-6
Merriam's kangaroo rat	2-3	6-7	7	7	9	9	6-7
Grasshopper mice	1-2	4-5	7	8	9	9	4-5
Harvest mice	1-2	4-5	2-3	8	9	9	4-5
Deer mice	1-2	4-5	2-3	8	9	9	4-5
Hispid cotton rat	1-2	4-5	2-3	8	9	9	4-5
White-throated wood rat	2	6-7	2-3	7	9	9	6-7
Coyote	2	6-7	7	NA	9	9	6-7

*Approximately 6 miles of three-stand antelope fence expected to impede movement slightly.

Definition of Impacts

1. Retrogression of habitat--habitat condition would decline up to 25%, depending upon the length of the impact period within the proposed framework of livestock use.

2. Habitat condition would remain static during the impact period. No progression in habitat condition would be expected.

Note: Certain wildlife species prefer or are better able to survive under deteriorated range condition.

3. Habitat improvement would be greatly retarded, reaching only 25% of expected potential.

4. Habitat improvement would be retarded, reaching from 25-50% of expected potential.

5. Habitat improvement would be retarded, reaching 50-75% of expected potential.

6. Habitat condition improvement would be lightly retarded, reaching 75-90 percent of expected potential.

7. Only minor (insignificant) overall adverse impacts from proposed action are expected on the population of the ES area.

8. The death of a few animals would result, but the impact would be insignificant on the population of the ES area.

9. Proposed action would likely result in the death or displacement (permanent or temporary) of a few animals but would be insignificant to the population of the ES area.

NA Not applicable.

TABLE 5-1 (cont.)

Wildlife (Affected)	IMPACT CATEGORIES 1. Livestock grazing during periods of low-range productivity--use attains the upper limit of 60% in consecutive years.	2. Competition for food and cover--use averages 40% but does not attain 60% in consecutive years.	3. Impacts in aquatic/riparian areas not proposed for fencing. (Local impact)	4. Trampling by livestock resulting in death of animals.	5. Construction of water projects. (Short term)	6. Construction of fence projects. (Short term)	7. Overall residual impact excluding categories 1. and 3.
Kit fox	2	5-6	7	NA	9	9	5-6
Grey fox	2	5-6	6-7	NA	9	9	5-6
Ringtail	1-2	5-6	2-3	NA	9	9	5-6
Raccoon	1-2	6	2	NA	9	9	5-6
Coati	2	6-7	7	NA	9	9	6
Skunk(s)	2	5-6	2-3	NA	9	9	5-6
Bobcat	2	5-6	7	NA	9	9	5-6
Great blue heron	7	6	2-3	NA	9	9	6
Cooper's hawk	2	5-6	2-3	NA	9	9	5-6
Red-tailed hawk	2	5-6	2-3	NA	9	9	5-6
Golden eagle	2	5-6	7	NA	9	9	5-6
Gambel's quail	2	5-6	2-3	8	9	9	5-6
Scaled quail	1-2	5	NA	8	9	9	5
Montezuma quail	1-2	5	NA	8	9	9	5
Killdeer	2	5-6	2	8	9	9	5-6
Mourning dove	2	5-6	2	8	9	9	5-6
Ground dove	2	5-6	2	8	9	9	5-6
Whip-poor-will	2	6-7	7	8	9	9	6-7
Poor-will	2	6	7	8	9	9	6
Common nighthawk	2	6-7	7	8	9	9	6-7
Lesser nighthawk	2	6	7	8	9	9	6
Horned lark	2	6-7	NA	8	9	9	6-7
Meadowlark	2	6-7	NA	8	9	9	6-7
Lark bunting	2	6	NA	NA	9	9	6
Cassin's sparrow	2	6	NA	NA	9	9	6
Black-throated sparrow	2	6-7	7	7	9	9	6-7
Dark-eyed junco	2	6	7	7	9	9	6
Sage sparrow	2	6	7	7	9	9	6
Chipping sparrow	2	6	6	7	9	9	6
Brewer's sparrow	2	6	7	7	9	9	6
White-crowned sparrow	2	6	6	7	9	9	6
Couch's spadefoot toad	1-2	5-6	2-3	8+	9	9	5-6

+Slightly more vulnerable to death by trampling.

TABLE 5-1 (cont.)

Wildlife (Affected)	IMPACT CATEGORIES 1. Livestock grazing during periods of low-range productivity--use attains the upper limit of 60% in consecutive years.	2. Competition for food and cover--use averages 40% but does not attain 60% in consecutive years.	3. Impacts in aquatic/riparian areas not proposed for fencing. (Local impact)	4. Trampling by livestock resulting in death of animals.	5. Construction of water projects. (Short term)	6. Construction of fence projects. (Short term)	7. Overall residual impact excluding categories 1. and 3.
Plains spadefoot toad	1-2	5	2-3	8+	9	9	5
Western spadefoot toad	1-2	5	2-3	8+	9	9	5
Great Plains toad	1-2	5	2-3	8+	9	9	5
Red-spotted toad	2	5-6	2-3	8+	9	9	5-6
Woodhouse's toad	1-2	5	2	8+	9	9	5
Leopard frog	1-2	5-6	2	8+	9	9	5-6
Eastern fence lizard	2	5-6	7	7	9	9	5-6
Desert grassland whiptail	2	5-6	7	7	9	9	5-6
Little striped whiptail	2	5-6	7	7	9	9	5-6
Texas blind snake	2	5-6	2-3	8	9	9	5-6
Ringneck snake	2	5-6	2-3	7-8	9	9	5-6
Western hognose snake	2	5-6	2-3	7-8	9	9	5-6
Western hook-nosed snake	2	5-6	7	7	9	9	5-6
Black-neck garter snake	1-2	5	2-3	7-8	9	9	5
Checkered garter snake	1-2	5	2-3	7-8	9	9	5
	THREATENED/ENDANGERED SPECIES						
Black-tailed prairie dog	(Not known to occur at present)						5-6 (If present)
Mexican wolf	(May occur sporatically)						7 (If present)
Desert bighorn	1	1-2	NA	NA	NA	NA	1-2
Black-crowned night heron	(Desirable permanent habitat not available)						7
Snowy egret	(Desirable permanent habitat not available)						7
Black-bellied tree duck	(Desirable permanent habitat not available)						7
Mexican duck	(Desirable permanent habitat not available)						7
Zone-tailed hawk	1-2	6	2-3	NA	9	9	6

TABLE 5-1 (cont.)

Wildlife (Affected)	IMPACT CATEGORIES: 1. Livestock grazing during periods of low-range productivity--use attains the upper limit of 60% in consecutive years.	2. Competition for food and cover--use averages 40% but does not attain 60% in consecutive years.	3. Impacts in aquatic/riparian areas not proposed for fencing. (Local impact)	4. Trampling by livestock resulting in death of animals.	5. Construction of water projects. (Short term)	6. Construction of fence projects. (Short term)	7. Overall residual impact excluding categories 1. and 3.
Grey hawk	(Not known to occur at present)						5-6 (If present)
Black hawk	1-2	6-7	2-3	NA	9	9	6-7
Southern bald eagle	1-2	6	2-3	NA	9	9	6
Pegrine falcon	1-2	6	2-3	NA	9	9	6
Buff-breasted flycatcher	1-2	6-7	2-3	NA	9	9	6
Beardless flycatcher	1-2	6-7	2-3	NA	9	9	6
Green toad	1-2	5	2-3	8+	9	9	5
Gila monster	2	6	2-3	8	9	9	6
Desert tortoise	(May occur, not confirmed)						5-6 (If present)
Green ratsnake	2	6	7	7	9	9	6
Western massasauga	(No recent confirmation of occurrence)						5 (If present)
Rock rattlesnake	(No recent confirmation of occurrence)						6 (If present)
Twin-spotted rattlesnake	(No recent confirmation of occurrence)						6 (If present)
Loach minnow	(Habitat secure in Aravaipa Canyon Primitive Area)						6 (Elsewhere, if present)
Round-tailed chub	(Habitat secure in Aravaipa Canyon Primitive Area)						6 (Elsewhere, if present)
Spikedace	(Habitat secure in Aravaipa Canyon Primitive Area)						6 (Elsewhere, if present)
Gila topminnow	(No recent confirmation of occurrence)						Unknown

Category 7 excludes category 3 because category 3 considers only local impacts within the small area of permanent aquatic and riparian habitat not proposed for fencing.

PALEONTOLOGICAL RESOURCES

Eight of the paleontological sites on public lands within the ES area would not be fenced, resulting in minor and insignificant damage from livestock trampling. The scientific integrity of the sites, however, would not be compromised.

CULTURAL RESOURCES

Unavoidable adverse impacts to the cultural resources of the ES area would result from all activities of the proposed action. The degree of impact would be as follows:

- Livestock grazing (trampling)--low, adverse
- Range improvements--negligible, adverse
- Mitigative data recovery--negligible, adverse
- Erosion--low, adverse
- Vandalism, visitor use, trampling, and erosion as a result of improvements and improved access--negligible, adverse

Descriptions of the specific impacts are included in chapter 3.

Although the proposed action would benefit cultural resources by reducing the impact of trampling and erosion from the present moderately adverse to low adverse, a residual low adverse impact is expected to occur after completion of mitigative measures.

Construction of range improvements might disturb or destroy sites or introduce visual intrusions or alter the site's environment. Construction might also disturb or destroy buried cultural sites if they are not discovered during clearance surveys. The residual impacts after mitigation are expected to be adverse but negligible.

Several unavoidable adverse impacts are anticipated from the implementation of construction stipulations. The most damaging measure is salvage. Although valuable data may be recovered, salvage is an irretrievable commitment of the resource that removes forever a portion of the area's data base. The option to salvage would be chosen only when a known site could not be avoided when a route is planned, when a buried site is discovered during construction, or when vandalism or other adverse impacts have damaged sites to the point where other protective measures would not be satisfactory.

Less destructive measures such as fencing and signing would create unavoidable adverse impacts in the form of visual intrusions, which would alter the site's setting and original environment.

Delays in implementing the monitoring of known sites and the inventory of areas not previously intensively surveyed would result in continued adverse impacts for the short term. Although the monitoring and surveys would be conducted as frequently as possible, delays in identifying and mitigating continuing or new impacts (proposed action and nonproposed action caused) are anticipated.

Indirect impacts of range improvement construction (increased trampling, erosion, vandalism, and visitor use near the improvements), though partially mitigated through fencing sites and other measures, would remain as negligible adverse impacts.

All anticipated unavoidable adverse impacts would result in data loss and the resultant depletion of the resource base. These impacts constitute the most significant loss expected to occur to the cultural resources as a result of the proposed action. Those most affected would be future researchers whose source of data has already been greatly reduced by vandalism and construction in the ES area.

All unavoidable adverse impacts could also lower the recreational values of the individual sites having recreational values and might decrease the recreational use of these resources. Opportunities for enjoyment of scenic, historical, architectural, cultural, and other qualities would be decreased in quality and quantity. The degree and frequency of this impact, however, is not expected to be great.

PRIMITIVE VALUES

The fencing and exclusion of the four proposed research natural areas would eliminate a maximum of 492 AUMs annually from livestock grazing in the grazing units identified in table 5-2. Additionally, deferment of grazing in the proposed outstanding natural areas would eliminate from livestock grazing a maximum of 2,705 AUMs annually during the deferred period. The associated 43 miles of fencing would temporarily disturb the site, create a visual intrusion, and restrict vehicular access. Removal of existing management facilities in the research natural areas would temporarily disturb the site.

RECREATION

Residual impacts on recreation land use would be low and would not change the present recreation resource value classes or reduce visitor use.

The 153 miles of fence proposed in the ES area would have the long-term effect of restricting ORV access. Use of more visible colors of fenceposts on 3 miles of fence in the known ORV use area near Jackson Mountain would have an additional long-term negative impact on visual resources.

TABLE 5-2
MITIGATION-CAUSED RESIDUAL IMPACTS ON NATURAL AREAS

Name	Grazing Unit No.	Acres of Fenced Public Lands	AUMs Lost Annually	Miles of Fence
RESEARCH NATURAL AREAS				
Little Doubtful	45	1,200	192	2
Dos Cabezas	72	400	40	1
Howell Canyon	73	600	60	1
	74	1,040	110	2
Government Peak	73	1,480	90	4
OUTSTANDING NATURAL AREAS				
Fishhook Canyon	151	3,800	220	12
Markham Canyon	154	2,080	200	8
	158	160	15	1
Johnny Creek	165	1,840	176	4
Bonita Creek	165	360	40	Not required
	166	7,720	720	Not required
	167	680	70	Not required
Eagle Creek	3	3,360	420	5
	168	2,160	300	3
Gila Box	3	360	24	Not required
	7	5,950	360	Not required
	16	840	70	Not required
	17	50	6	Not required
	167	840	84	Not required

UNAVOIDABLE ADVERSE IMPACTS

Vandalism of range improvements would continue and could even increase because of the substantial number of new facilities proposed.

ECONOMIC AND SOCIAL CONDITIONS

The adverse economic and social impacts identified in chapter 3 cannot be mitigated and are therefore carried into this chapter as unmitigated adverse impacts.

CHAPTER 6

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

6

CHAPTER 6

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This chapter analyzes the trade-offs between short- and long-term productivity of individual resources involved in the proposed action (table 6-1). For this analysis, short-term refers to the period of time required to achieve Allotment Management Plan objectives (15 years after implementation), and long-term refers to the period beyond 15 years in which the proposed action's adverse or beneficial impacts would still occur. This chapter, however, does not include cumulative impacts of the proposed action with other Federal, State, or private actions identified in the Interrelationship section of chapter 1.

TABLE 6-1
SUMMARY OF TRADE-OFFS: SHORT-TERM VS. LONG-TERM PRODUCTIVITY

Resource	Short Term	Long Term	Trade-Offs	Net Effect on the Natural Environment Over the Long Term
Climate	None	None	None	No Change
Air Quality	A slight increase in pollutants (exhaust fumes and dust) would result from (1) construction of range improvements and (2) concentration of livestock in use pastures.	A decrease in pollutants (exhaust fumes and dust) would result from improved vegetative response. Vegetation would protect the soil and thereby diminish dust particles in the air.	A short-term increase in pollutants would be traded to develop the grazing program. In the long term, pollutants would decrease.	Improvement
Geologic Setting	None	None	None	No Change
Topography	None	None	None	No Change
Soils	Soil loss would slightly increase from construction and concentration of livestock in pasture.	Increased vegetation production and ground cover would result in a significant long-term reduction in soil loss.	The short-term loss would be traded for a long-term overall reduction in soil loss after management objectives are met.	Improvement
Water Resources	Water quality would decline slightly because of the temporary increase in soil erosion.	Reduced sediment yield, slower runoff rates, and more on-site water recharge would result in a long-term improvement in water quality in all perennial streams in the ES area.	The initial decline in water quality would be traded for a long-term improvement in water quality.	Improvement
Vegetation	739 acres of vegetation would be temporarily lost from production.	Approximately 362 acres of vegetation would be permanently lost due to range improvement construction. Plant vigor, reproduction, seedling establishment and litter accumulation would increase by 50 percent, palatable species would increase, and overall range condition would improve. Vegetation for livestock and wildlife would increase.	The short-term loss of vegetation would be traded for a significant long-term increase in vegetation production.	Improvement
Wildlife	Range improvement construction would disturb wildlife for a short period of time. Livestock-wildlife competition would intially increase during period of livestock concentration in pastures.	Competition between livestock and wildlife for forage would decrease. Riparian and aquatic wildlife communities would stabilize, and an increase in available forage and improvement of habitat would result in increased numbers of wildlife.	The short-term adverse impact on wildlife from construction would be traded for the overall improvement of wildlife habitat and increase in wildlife populations.	Improvement
Natural History Resources and Cultural Resources	Eighteen cultural sites could be directly impacted by range improvement construction and mitigative data recovery. Sites avoided could be adversely affected by visual intrusions and alteration of the surrounding environment.	The adverse effects of trampling by livestock would be slightly reduced. Exposing of sites by range improvement construction could increase trampling, erosion, and vandalism. Watershed improvement would result in decreased erosion of natural history and cultural sites.	Permanent depletion of the data base and decrease in the quality of recreation and other values would outweigh short-term gains in knowledge, shifting of impacts, and decreased erosion. Although the trade-off does not appear favorable, the degree of impact for the proposal would be slightly less than the degree of impact at present.	Improvement
Visual Resources	Construction would create visual intrusions having their greatest impacts in the short term.	Vegetation growth would lessen visual impact, although all projects would have some impact as long as they exist.	Adverse short-term impacts would be traded for a long-term overall visual improvement resulting from an increase in vegetation and consequent reduction in soil erosion.	Improvement
Recreation	Most recreation opportunities would improve. Range improvement construction might interfere with hunting, hiking, and sightseeing.	The long-term improvement of wildlife habitat, visual resources, and water resources would improve recreation opportunities. Construction of roads would make more land accessible to recreationists.	Expected recreation benefits would far outweigh short-term disturbance of hunting, hiking, and sightseeing.	Improvement
Minerals	None	None	None	No Change
Livestock Grazing	Reductions in livestock numbers would reduce competition between livestock and wildlife. Increased forage production would benefit most of the other existing resources. The initial reduction in livestock would reduce incomes of some allottees. Complying with AMPs would increase the expense of handling livestock.	Over the long term, vegetation would increase, making more forage available for livestock. Range condition and carrying capacity would be evaluated periodically and livestock numbers adjusted to proper carrying capacity, which should be significantly greater than the present capacity. A long-term increase in calf weaning weights, percent calf crop, and cull cow weights would accompany a decrease in death loss.	The short-term reduction in livestock numbers would be traded for increased vegetation cover, improved wildlife habitat, watershed protection, water quality, recreation opportunities, and a reduction in the loss of cultural and historical resources.	Improvement
Economic and Social Conditions	Allottees would lose income as a result of decreases in allowable livestock use. Range improvement construction, however, would add money to the local economy. Reductions in livestock would reduce county incomes from taxes. BLM would collect less in grazing fees	The grazing capacity of the ES area would increase as the range improves. Percent calf crop and weaning weights would also increase. In the long term allottees would increase their earnings.	Short-term reduction in licensee income would be traded for long-term increases in income.	Improvement

CHAPTER 7

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

7

CHAPTER 7

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This chapter identifies the irreversible and irretrievable commitment of resources resulting from the proposed action. The term irreversible refers to what is incapable of being reversed: once an action begins, it would continue. The term irretrievable means irrecoverable: once something is used, it is not replaceable.

If the proposed action is implemented, few irreversible or irretrievable commitments of resources would result. Human resources and monies, fuel, and materials used in implementing this proposal would be irreversible and irretrievable. Archaeological, historical, and scenic values inadvertently destroyed by the proposed actions would also be irretrievable. Finally, soils eroded as a result of the proposed action would be irretrievable. All other resources involved in the proposed action, however, would be retrievable, reversible, or both.

The following discussion of the ES area's resources identifies possible resource commitments.

SOILS AND WATERSHED

During the construction of range improvements, detention dams, and roads and trails, erosion would be accelerated for several years, and water quality might decrease slightly. These commitments, however, are not irreversible. Increased soil loss is irretrievable, but, over the long term, soil erosion would decrease, and water quality would improve.

VEGETATION AND ANIMALS

During construction of range improvements, detention dams, and roads and trails, 739 acres of vegetation would be destroyed. More than half of these, 377 acres of vegetation could be reestablished, and their destruction would not be irreversible. Consumption of forage would also not be irretrievable, since under the proposed action overall vegetation would increase within the ES area. Similarly the proposed action would have no irreversible or irretrievable impacts on animals.

CULTURAL RESOURCES

All activities and indirect impacts of the proposed action are expected to disturb cultural resources at least to a slight degree, a disturbance that would be irreversible. Each cultural object, structure, site, or district is unique, fragile, and nonrenewable. Any damage to these resources or their environment results in loss of data that cannot be replaced or duplicated. The resultant depletion of the resource base would reduce opportunities for future preservation, research, or recreation use, and this reduction would be an irreversible and irretrievable commitment of the resource. Mitigation studies would not lessen this commitment, since study itself constitutes a commitment of the resource. Although the deteriorating trend in site condition would improve under the proposed action, the trend would be irreversible. The only trend expected to stabilize is erosion, but site condition would not improve as a result.

AESTHETICS

Any disturbance to surface soil or rock colors, erosion patterns, or geologic features that would leave a permanent scar on the landscape would be irreversible. Range improvement projects that would intrude on the naturalistic landscape would be irretrievable for the life of the facility.

RECREATION

Actions that would displace terrestrial or aquatic wildlife would reduce the quality of consumptive and nonconsumptive recreation opportunities. Such actions would be irretrievable during their occurrence but they are not considered significant for the proposed action.

ECONOMIC AND SOCIAL CONDITIONS

The proposed action would involve the commitment of material associated with the proposed improvements listed in appendix D. Once installed, these materials would basically be irretrievably committed, although the materials might have some salvage value.

The major irreversible and irretrievable commitment would involve the costs associated with installation, maintenance, or administration of components of the proposed action. Once the expenditures are made, those particular funds would not be available for alternative public programs. An additional irretrievable commitment would involve the labor associated with the proposed action. Labor, once expended, cannot be retrieved. Moreover, irretrievable losses of property tax revenue would occur with reductions in livestock use.

CHAPTER 8

ALTERNATIVES TO THE PROPOSED ACTION

CHAPTER 8

ALTERNATIVES TO THE PROPOSED ACTION

Chapter 8 describes four alternatives to the proposed action and discusses the anticipated impacts of each alternative. The four alternatives are (1) no action, (2) elimination of grazing on public lands, (3) limited management, and (4) reduction to 50 percent of grazing capacity.

Between the no-action alternative and the elimination of grazing are an infinite number of alternatives. The alternatives selected that are intermediate to the two extremes reflect significant variation in degree of impacts, thus providing a wide basis for decisionmaking.

Table 8-1 compares the estimated long-term impacts on major environmental elements of the proposed action and of the four alternatives. This table also ranks the magnitude of impact in ascending order. The least adverse or most beneficial impact is shown as 1, and the highest adverse or least beneficial impact is shown as 5.

NO ACTION

Description

Under the no-action alternative the existing level of management would continue without change, and the level of management that would be attained by the proposed action would not be reached. The present amount of authorized livestock use on all grazing units would remain the same with no major adjustments. The existing 16 allotments managed under Allotment Management Plans (AMPs) would continue to be operated without major changes, but no new AMPs would be implemented. No additional areas would be deferred from livestock use, and no additional public lands would be classified and managed as ephemeral range. The Tanque, Barrier, and Slick Rock detention dams would not be constructed. Range improvements would be constructed only as needed for the orderly use of the range. Other management programs, such as wildlife habitat, minerals, and recreation, would continue.

Impact Analysis

Soil and Water Resources

If the no-action alternative is adopted, sediment yield is not expected to increase significantly (see table 8-1), remaining about the same or slightly higher than the present 2,330 acre-feet per year. Areas presently in critical or severe erosion condition class would increase to 270,000 acres. Acres identified as soil problem areas would not improve. No new soil disturbance, however, would be associated with this alternative.

TABLE 8-1
COMPARISON OF LONG-TERM MAJOR IMPACTS OF THE PROPOSAL AND ALTERNATIVES

Environmental Element	Unit	Present Status	Proposed Action (Rank)**	Alternative 1 No Action (Rank)**	Alternative 2 Elimination of Grazing (Rank)**	Alternative 3 Limited Management (Rank)**	Alternative 4 50% Grazing Capacity (Rank)**
Soils							
Disturbance	Acres	0	336 (3/4)	0 (1)	4,200 (5)	140 (2)	336 (3/4)
Sediment Loss	Ac.Ft./Yr.	2,330	1,492 (3)	2,330 (5)	1,265 (1)	1,560 (4)	1,380 (2)
Critical or Severe Erosion Condition	Acres	264,787	240,000 (3)	270,000 (5)	230,000 (1)	250,000 (4)	235,000 (2)
Vegetation							
Range Condition	Acres*						
Excellent		61,640	104,398 } (3)	45,698 } (5)	110,000 } (1)	80,000 } (4)	108,000 } (2)
Good		145,564	314,954 }	153,453 }	315,000 }	300,000 }	315,000 }
Fair		1,230,334	1,202,279 } (3)	1,172,594 } (5)	1,270,000 } (1)	1,240,000 } (4)	1,212,000 } (2)
Poor		908,526	724,431 }	974,317 }	651,062 }	726,062 }	711,062 }
Production	AUMs	116,989	131,226 (1/2/3)	96,314 (5)	131,226 (1/2/3)	129,802 (4)	131,226 (1/2/3)
Ground Cover	% Change	---	+50 (3)	-20 (5)	+60 (1)	+45 (4)	+55 (2)
Wildlife							
Mule Deer	Number	4,200	4,830-5,250 (3)	3,800-4,000 (5)	5,500 (1)	4,400-4,600 (4)	5,000-5,350 (2)
Javelina	"	4,135	4,550-4,750 (3)	3,900-4,050 (5)	5,000 (1)	4,300-4,500 (4)	4,650-4,850 (2)
White-tailed Deer	"	550	630- 650 (3)	450- 480 (5)	750 (1)	620- 650 (4)	650- 680 (2)
Elk	"	35-40	35- 40 (3)	35- 40 (5)	35-40 (1)	35- 40 (4)	35- 40 (2)
Bighorn Sheep	"	30-35	18- 25 (3)	18- 25 (5)	35-40 (1)	18- 25 (4)	18- 25 (2)
Antelope	"	20	26- 30 (3)	16- 20 (5)	30-36 (1)	26- 30 (4)	28- 32 (2)
Cultural Resources							
Sites Disturbed or Destroyed	Number	133	100 (3/4)	133 (5)	Unknown (1)	Unknown (3/4)	100 (2)
Livestock Grazing	AUMs	172,070	129,098 (2)	151,395 (1)	0 (5)	123,161 (4)	57,430-129,098 (3)
Calf Crops	% Change	---	+10.8 (2)	-10 (4)	N/A	+8 (3)	+13 (1)
Calf Weaned Weights	Change Pounds	---	+48 (2)	-25 (4)	N/A	+30 (3)	+50 (1)
Cull Cow Weights	Change Pounds	---	+40 (2)	-30 (4)	N/A	+30 (3)	+50 (1)
Death Loss	% Change	---	-3.7 (2)	+5 (4)	N/A	-2 (3)	-5 (1)
Economics							
Improve Maintenance	Dollars	---	32,000 (4/5)	--- (1)	21,000 (3)	2,500 (2)	32,000 (4/5)
Income (Direct + Indirect)	Change $	---	+407,000 (1)	-104,000 (4)	-1,413,000 (5)	+338,000 (3)	+351,000 (2)
Ranch Values	Change $	---	-5,580,000 (2)	-1,480,000 (1)	-20,070,000 (5)	-6,040,000 (3)	-7,400,000 (4)
Revenue to Counties	Change $	---	-17,900 (2)	-4,800 (1)	-65,000 (5)	-19,400 (3)	-23,800 (4)

*Excludes areas on allotments over which BLM has no control.

**Numbers in parenthesis represent a ranking of how the proposed action or alternative would impact an environmental element. A ranking of (1) indicates the least adverse or most beneficial impact, and a ranking of (5) indicates the most adverse or least beneficial impact.

Neither water quantity nor quality is expected to change significantly under the no-action alternative. Sediment loads might increase slightly but not significantly.

Vegetation

If livestock numbers are not reduced on public lands in the ES area, the vegetation resource, as a whole, would deteriorate in the next 15 years. Table 2-28 and 8-1 display changes in range condition estimated to occur in 15 years under existing range management.

The Area of desert grassland would continue to decrease slowly as the principal grass plants--tobosa grass and alkali sacaton--die and are not replaced by new plants. Undesirable plants, such as snakeweed, burroweed, and creosotebush, would increase in the area. The mountain grasslands and mountain shrub vegetation types would decrease in percent composition of desirable species--sideoats grama, mountain mahogany, and Wright's buckwheat--and increase in undesirable species--turpentine bush, snakeweed, and burroweed.

The pinyon-juniper vegetation type would remain virtually unchanged, since most of it is either inaccessible to livestock or is found on allotments in good condition.

The broadleaf riparian vegetation type would deteriorate as livestock use in the bottom lands continues. Reproduction of velvet ash, cottonwood, sycamore, and other riparian tree species would remain low. Mesquite would continue to increase as the seeds are disseminated by livestock. Only in the Aravaipa Canyon Primitive Area would this vegetation type experience a continued upward trend, since livestock have been removed from the canyon bottoms.

The creosotebush vegetation type would remain as it is now with few exceptions, since it contains mostly unpalatable shrubby species. The palatable species present--four-wing saltbush, tobosa grass, black grama, and bush muhly--would virtually disappear in 15 years as a result of excessive stocking.

The mesquite type would remain as it is now, dominated by shrubby plant specicies of low palatability. This type is generally in a stable condition, but it might increase slightly in acreage.

The acreage of the saltbush type would expand slightly in 15 years.

The desert shrub type would not appreciably change in size but would change in composition. Major grass species (sideoats grama, black grama, tobosa grass and bush muhly) would decrease in percent composition. Palatable shrubs (jojoba, four-wing saltbush) would continue to be overused, and reproduction would be low. Half-shrubs would take advantage of lowered perennial grass production and vigor and would increase in composition.

The half-shrub type would increase in acreage at the expense of palatable perennial grasses.

In all vegetation types as the plant density decreases, the amount of bare ground would increase, and gullying would become more evident.

Threatened or endangered plant species would not be affected by this alternative.

Animals

The no-action alternative would have varying effects on the fauna of the ES area. Figures 2-15 through 2-24 and table 8-1 portray population projections for important and representative species. Species that prefer heavily used and deteriorating ranges would increase. Balda (1975) found that a well-managed grassland at the base of the Chiricahua Mountains, next to the southeastern boundary of the ES area, supported 4 species of breeding birds, whereas a highly overgrazed grassland that had been invaded by shrubs and succulents supported 20 species. Balda did not endorse overgrazing as a habitat management practice but called for the maintenance of a more "natural" plant and animal species composition and density. Other species would continue to decrease or remain static. Wildlife species associated with the grassland complex and riparian areas would be the most adversely affected. Benefits to wildlife provided by permanent water development would be lost.

Many insect species densities are currently low compared to the potential of the ES area. Whether these insect species densities would increase or decrease under existing management is not known, but an increase in these densities would probably be correlated with an improvement in range conditions. Under the no-action alternative, insect species densities are expected to decline slightly.

Natural History Resources

Paleontological Resources. The no-action alternative would have a low negative impact on paleontological resources. The condition of the vegetation would continue to decline, allowing erosion of the paleontological sites to increase slightly. All of the sites would be grazed at the present stocking rates, and livestock would continue to trample and break exposed fossils and contribute to bank sluffing, which would displace fossils and result in loss of their contextual value.

An insignificant amount of scientific, educational, and recreational information would be lost from erosion due to overgrazing, and the loss would be insufficient to change the scientific educational or recreational values of any sites, including the natural area eligibility of sites P-1, P-5, and P-15.

Geological Resources. Continued decline in the condition of the vegetation would result in a slight increase in erosion on geologic sites G-1, G-2, and G-3.

The no-action alternative would have a low negative impact upon the scientific, educational, and recreation value of these sites, which would be insufficient to change their present quality.

Cultural Resource

Under the no-action alternative, livestock numbers and distribution would remain as at present. The moderately adverse impact of grazing on cultural resources would continue, but the limited number of range improvements built would have a negligible adverse impact.

Under this alternative the three detention dams would not be constructed, and watershed condition would continue to deteriorate in some areas.

Erosion would increase, but its impacts on cultural resources would not exceed the present level of moderate adverse. In the long run, the impact of erosion under the proposed action would decline to a low adverse status. Vandalism and visitor use resulting from this alternative would not increase above the present negligible level.

The no-action alternative's adverse impacts on cultural resources could be lessened by following the mitigation listed in chapters 1 and 4. Grazing impacts would be slightly reduced; range improvement impacts would be slightly reduced; and the indirect impacts of erosion and increased vandalism and visitor use would decrease by a negligible amount.

The unavoidable adverse impacts would remain from all sources, including the following:

livestock grazing	moderate, adverse
range improvements	negligible, adverse
mitigative data recovery	low, adverse
erosion	moderate, adverse
vandalism and visitor use	negligible, adverse

Aesthetics

Under the no-action alternative the range improvements of the proposed action would not be constructed. As a result, the visual resources would be affected by fewer new facilities--only those improvements deemed necessary for the orderly use of the range.

Soil erosion rates would increase slightly, and the condition of vegetation would continue to deteriorate. Livestock in riparian areas would continue to strip vegetation and trample streambanks, contributing to a decline in visual quality. These impacts would be unavoidable and could not be mitigated.

Excess forage depletion would change the color and texture of vegetation and impact the naturalistic landscape. In addition, trampling and vegetation removal in areas of concentrated livestock use would degrade the area's visual quality.

The no-action alternative would cause regression from natural conditions in the proposed natural areas. Soil erosion would increase slightly, and the condition of the vegetation would continue to decline or remain stable (table 8-2). Moreover, excessive grazing would inhibit reproduction of the riparian vegetation in the proposed outstanding natural areas, having a moderately negative impact. Continued grazing of the research natural areas would continue to deteriorate their scientific and educational value for comparison with areas grazed. Such grazing would thus have adverse impacts.

TABLE 8-2
IMPACTS OF NO-ACTION ALTERNATIVE ON NATURAL AREAS

NAME	ACRES OF PUBLIC LANDS Declining Vegetation Condition	Static Vegetation Condition
Fishhook Canyon	2,850	950
Markham Canyon	2,240	---
Johnny Creek	1,840	---
Bonita Creek	7,884	876
Eagle Creek	---	5,520
Gila Box	5,145	2,895
Little Doubtful Canyon	1,200	---
Dos Cabezas	400	---
Howell Canyon	1,640	---
Government Peak	1,480	---
San Simon State	---	---
TOTAL	24,679	10,241

Wilderness Values

This alternative would have minimal impact on the roadless areas identified in chapter 2.

Land Uses

Recreation.

Designations. Under the no-action alternative livestock grazing would not be deferred in the Gila Box Wild and Scenic River Study Area. The authorized livestock use would remain the same. Excessive grazing would prevent the reproduction of the riparian vegetation, reducing the quality of the riparian habitat, its related wildlife, and its scenic values. The Gila Box's potential for becoming a wild and scenic river would thus diminish. No action would have a moderately adverse impact on the recreation value of the Gila Box.

Facilities. The no-action alternative would have the same impact on facilities as the proposed action.

Recreation Uses, Use Areas, and Amounts.

Fishing. Soil erosion rates would increase slightly, adding to the turbidity of the Gila River and having a low negative impact on fishing. The Class B fishing quality rating and the amount of visitor use, however, would not change.

Hunting. The no-action alternative would not improve the wildlife habitat or the populations of deer, javelina, mountain lion, dove, quail, or rabbits. With no appreciable changes in populations, the hunting quality and rating class would probably remain the same (table 2-17), and visitor use would not change appreciably because demand would not change.

Sightseeing. Authorized livestock grazing would remain the same, and riparian habitat areas would continue to be excessively grazed, preventing reproduction of the riparian vegetation vital to birdlife. Bird populations would decrease, having the moderately adverse impact of reducing the sightseeing recreation value of the Gila Box, Bonita Creek, Fishhook Canyon, Markham Canyon, and Johnny Creek.

The no-action alternative would result in overgrazing and a decline in vegetation condition on approximately 64 percent of the public lands in the ES area. Livestock reductions would be required, slightly reducing the opportunity to view livestock but not enough to change the present recreation quality.

Use Problems. The conflict of use between ranchers and recreationists would be the same as under the proposed action.

Livestock Grazing. If livestock numbers remain the same on public lands in the ES area, the carrying capacity of the range would continue to decrease at the rate of 1.2 percent per year. In 15 years this decrease would amount to 20,675 AUMs. A decrease in forage production would result in an estimated 10 percent decrease in percent calf crop, 25-pound decrease in calf weaning weights, and a 30-pound decrease in cull cow weights. The percent death loss is expected to increase by 5 percent.

Agriculture, Vegetation Products, and Mineral Resources. The no-action alternative would not affect agriculture, vegetation products, or mineral resources.

Economic Conditions

As range conditions in the ES area deteriorate under the no-action alternative, so would income to ranchers and counties. The decrease in carrying capacity would also be reflected in the decline of ranch values. Over a 50-year period, direct and indirect income from livestock would decrease by $104,000 annually, and counties would lose $2,300 annually in Taylor Grazing Act fees and $2,500 annually in property taxes. Ranch values are expected to decline by about $1,480,000. Employment is not expected to change significantly.

ELIMINATION OF GRAZING ON PUBLIC LANDS

Description

Under this alternative, livestock grazing would be eliminated on public lands in the ES area. Grazing trespass could be controlled only by extensive fencing to separate the large amount of State and private land intermingled with public lands. Approximately 2,100 miles of boundaries would have to be surveyed and fenced. Existing range improvements on public lands serving no useful purpose would be removed. With the large amount of new boundary fencing, many private landowners could be expected to close their lands to the public, thereby limiting access to public lands.

The proposed Tanque, Barrier, and Slick Rock detention dams would be constructed as soon as possible to control erosion in the San Simon drainage. Other management programs, such as wildlife, minerals, and recreation, would continue as well as the maintenance of some range improvements.

Impact Analysis

Soil and Water Resources

The Pacific Southwest Inter-Agency Committee (1968) method of calculating sediment yield indicates that eliminating grazing on public land would reduce sediment yield in the ES area from the present 2,330 acre-feet per year to approximately 1,925 acre-feet per year. The construction of the detention dams would reduce soil loss by another 660 acre-feet per year.

Problem areas outlined in chapter 2 would improve with the elimination of livestock grazing. Blowing dust, however, would continue to be a problem in the San Simon and Bowie areas, since much of it is generated on private farmland.

Vegetation

Plant cover would increase from 40 to 60 percent on almost all areas except the barren vegetation type. Land with a plant cover of 10 percent might increase to 15 percent and hence show a 50 percent increase. Plant cover in riparian areas would increase most rapidly because of the moisture available to and resilience of the plant communities.

Grasses would increase in density and cover due to improved vigor and reproduction. Litter accumulation would improve microsite conditions for seedling establishment and plant growth. Litter accumulation would also increase the occurrence and size of wildfires. Wildfires would help restore grasslands invaded by shrubs.

Fire and competition from grasses would decrease the shrub cover on areas invaded by shrubs, but shrub cover would remain nearly stable on naturally occurring shrub vegetation types. Shrubs highly palatable to livestock would gain vigor, obtain good growth form, and reproduce.

Desert shrub vegetation and barren lands along the San Simon River would become lush grasslands of Johnson grass, vine mesquite, Halls panic and blue panic. Tamarisk would become more abundant along the main channel and in areas subjected to prolonged flooding. Estimated changes in range condition are shown on table 8-1.

This alternative is expected to have no adverse or beneficial impacts on threatened or endangered plant species.

Animals

The elimination of grazing on public lands would end the competition between wildlife and livestock on public lands. The 172,070 AUMs of forage now consumed by livestock would immediately be available to wildlife. As range conditions improve, the amount of forage available to wildlife would increase. Habitat conditions, however, would not improve for all wildlife species. Optimum habitats for some species are seral plant communities.

Most wildlife populations would increase as range conditions improve toward a higher seral plant community (see table 8-1). For most of the open range, climax conditions would not occur within the 15-year period. A more rapid stabilization is expected, however, in aquatic and riparian areas, although large trees, including cottonwoods and willows would not achieve maximum height. Mountainous areas with their greater moisture are expected to improve more rapidly than the lower desert ranges. But many of these populations would again decrease as the climax is reached. The climax association may have the greatest species diversity but does not support the highest population densities.

Vulnerability of furbearers, predators, and game animals to hunting would lessen because new boundary fences would decrease hunter access.

Unless BLM maintains water developments presently maintained by allottees on public lands, some wildlife habitat would be lost for lack of water. Areas near natural waters and waters needing no maintenance would become good wildlife habitat as range conditions improve.

Populations depending upon riparian habitats would change most drastically. Insect diversity and populations would increase significantly in 15 to 25 years, and insects would begin to provide adequate food for insectivores. The grasslands that would develop behind the Barrier, Tanque, and Slick Rock detention dams would provide highly productive habitats for many wildlife species.

Mule Deer. Most mule deer habitat is in poor to fair condition, especially at lower elevations. Livestock removal would improve mule deer habitat and increase populations. Mule deer would no longer have to compete with livestock for desired palatable plants, and all maintained water developments would become beneficial. Mule deer would probably reach their maximum numbers before climax vegetation develops.

White-tailed Deer. White-tailed deer range might increase at its lower elevational limits. Coues' whitetail are probably more adapted to climax plant communities, and their population could be expected to increase as climax conditions are attained.

Javelina. Javelina habitat would improve near water and in riparian areas. The quality of javelina habitat, however, might decline as the climax plant communities develop and cacti decrease in abundance.

Pronghorn Antelope. The antelope herd in the ES area does not appear to be limited by forage. The removal of livestock from the public lands would thus not affect or only moderately increase antelope populations.

Bighorn Sheep. Livestock grazing has already been removed from Aravaipa Canyon and the public lands on its south rim. The elimination of grazing on the canyon's north rim may tend to increase the size of the bighorn sheep herd.

Large Predators. Lion populations would increase slightly as prey populations increase and as hunting and trapping decrease. Territory size would still limit populations, but decreased access might open new areas for breeding territories.

Small Game. Small-game habitat would generally be improved by increases in ground cover. In addition, small game would no longer have to compete with livestock for annual grasses and forbs.

Insects. The densities of many insect species would increase significantly from 15 to 35 years after elimination of grazing. Insectivores dependent on these species for their diet would also increase in density.

Natural History Resources

Eliminating grazing on public lands would have a low beneficial impact on the paleontological and geological resources. The accelerated rate of erosion caused by overgrazing would decrease as the vegetation cover increases. Impacts related to livestock being on the sites, such as breaking fossils by trampling and contributing to bank sluffing, would be eliminated. The beneficial impacts, however, would be insufficient to change the scientific, educational, or recreation value of any paleontological or geological sites.

Cultural Resources

Eliminating grazing on public lands would highly benefit cultural properties by eliminating the adverse impacts of livestock trampling. Fencing livestock off public lands, however, would have a moderately adverse impact on cultural resources. Other types of range improvements would not be constructed, which would highly benefit the cultural resources. The removal of some existing improvements would have a negligible adverse impact on cultural properties. Any sites located in the impact zone of the Tanque, Barrier, or Slick Rock detention dams would be highly impacted. The indirect impacts of erosion would be reduced. Such impacts would be slightly less than under the proposed action and would result in a change from the present moderate to a low impact state.

Vandalism and visitor uses would be slightly lessened as a result of the blocking of vehicular access with boundary fences, but the anticipated level of impact would remain negligible.

The adverse impacts of fence construction could not be avoided by relocation, but the impacts would be reduced slightly by implementing other mitigative measures as described in chapter 1. Site-specific mitigative measures would reduce the adverse impact of erosion, vandalism, and visitor use to the same degree as under the proposed action, since the same level of inventory, monitoring, site patrols, and protective measures would be maintained.

The unavoidable adverse impacts and degree remaining after mitigation include the following:

livestock grazing	none
range improvements	negligible, adverse
detention dams*	high, adverse
mitigative data recovery	low, adverse
erosion	low, adverse
vandalism and visitor use	negligible, adverse

*Possible degree of impact. The expected degree cannot be estimated before clearance surveys.

Aesthetics

Eliminating livestock grazing on public lands would prevent potential modifications of the naturalistic landscape, such as establishing pastures or developing range improvements. Improvements needed to keep livestock off public lands, such as fences, however, could conflict with VRM objectives.

The removal of livestock from riparian areas would eliminate trampling of streambanks and enable vegetation to become reestablished, thus improving visual quality.

All existing range improvements could be removed and their sites rehabilitated, but the land surface scars and the present state of vegetation would never be totally restored to natural conditions existing before project development.

This alternative would reduce the potential for soil movement, and less visual disturbance would be associated with erosion than is anticipated under the proposed action.

VRM objectives could be used to keep boundary fences from conflicting with acceptable standards, and no longer needed range improvements could be removed and their sites rehabilitated. Nevertheless, boundary fences would remain as structures on the landscape and would modify the basic elements of line, color, and texture. Even with rehabilitation, abandoned range improvement sites would be noticeable.

The elimination of grazing on public lands would highly benefit the proposed research natural areas (RNAs). In part, the value of RNAs is as a base of comparison to grazed lands. With the removal of livestock, the need for these scientific study areas might diminish.

Eliminating grazing on the public lands would also highly benefit the proposed outstanding natural areas (ONAs). The riparian habitat would improve rapidly toward a climax vegetation with subsequent increases in wildlife. Specific impacts would initially (3-5 years) be the same as under the proposed action in the Gila Box and Bonita Creek. After 3 to 5 years, however, when the proposed action would resume grazing, the elimination of grazing alternative would be more beneficial than the proposed action. The elimination of grazing alternative would also be highly beneficial to Fishhook Canyon, Markham Canyon, and Johnny Creek. The benefits would be the same as those identified in the proposed action for Bonita Creek and Gila Box during the first 3 to 5 years.

Wilderness Values

This alternative would have minimal impact on the roadless areas identified in chapter 2.

Land Uses

Recreation.

Designations. Eliminating grazing on public lands would highly benefit the potential designation of the Gila Box Wild and Scenic River area. The riparian habitat would improve rapidly. Wildlife, especially birdlife, would increase. And scenic values would improve. The beneficial impacts of this alternative would be the same as those of the proposed action. Increased riparian vegetation cover would slightly restrict recreation access to the river.

Facilities. Eliminating grazing on public lands would eliminate all of the adverse impacts identified for the proposed action. The understory vegetation and ground cover would increase on all sites identified in the proposed action. The recreation value of all sites would be enhanced, and the impact would be moderately beneficial.

Recreation Uses, Use Areas and Amounts.

Fishing. Eliminating grazing would decrease the turbidity of the Gila River and increase the vegetation canopy along the river. Reduced water turbidity would improve water quality, and increased vegetation canopy would reduce critically high water temperatures, which would have a low beneficial impact upon fishing. The benefit, however, would be insufficient to change the present Class B fishing quality rating or the amount of visitor use.

Hunting. This alternative would have the same beneficial impacts on hunting as the proposed action. The projected population increases in huntable wildlife would be closer to the upper limits identified for the proposed action and would be reached in a slightly shorter time (10-12 years). With the anticipated increases in the population of huntable wildlife, hunting visitor use would increase to near the upper limits identified in the proposed action. The large amount of fencing needed for this alternative, however, would explicitly identify the private land. More private landowners would be expected to close their land to the public, thereby blocking access to public lands and immeasurably decreasing hunting visitor use. Reduced accessibility would also immeasurably reduce hunting quality.

Water Sports-Floatboating. The four existing fences across the upper Gila River, whose purpose is to separate grazing units, would not be needed. To eliminate grazing on public lands, however, eight additional fences would be needed across the Gila Box, and four additional fences would be needed across the lower Gila River. The eight cross fences would make the Gila Box dangerous for floatboaters, since it would no longer meet the acceptable minimum criteria. Twenty miles of river presently considered to be of Class C recreation quality would be eliminated, as well as 100 to 200 visitor use days annually. The four fences in the lower Gila River would make floatboating more hazardous and reduce the present recreation quality from Class B to Class C. Visitor use would not change.

Collecting--Rocks and Minerals. Fences to exclude livestock grazing would be located along property lines. Their impacts could not be mitigated. A total of 12.75 miles of fence would disturb 12.75 acres in five rockhound areas. Disturbances during construction would break, fracture, and displace collectable rocks and minerals but would not change the recreation quality of any areas.

The fences would be obstacles to visitors, who would consider them a nuisance. Without proper crossing devices the fences would be broken down by visitors trying to climb over them. The amount of visitor use, however, would not change.

Sightseeing. The riparian habitat areas would improve rapidly and increase the birdlife two to eight times in 15 years or less. The present sightseeing recreation quality of the Gila Box, Bonita Creek, Fishhook Canyon, Markham Canyon, and Johnny Creek (table 2-17) would improve to Class A. Visitor use would increase, but the extent of increase cannot be quantified.

The opportunity to view livestock on public lands--a Class C recreation opportunity--would be eliminated, having a highly negative impact.

Off-Road Vehicles. Of the 2,100 miles of fence needed to eliminate grazing on public lands, 58 miles would be constructed in off-road vehicle (ORV) use areas. The fences crossing numerous dry washes and existing roads would restrict ORV use and create additional hazards. The present Class B recreation quality and the amount of visitor use would not change.

Use Problems. If livestock were eliminated from public lands the adjacent private landowners would be expected to close their land to the public, in many instances blocking access to public lands. The conflict between ranchers and recreationists would intensify and would result in more vandalism and trespass. Visitor use would decrease, but the extent of the decrease cannot be quantified.

Livestock Grazing. Eliminating livestock grazing on public lands might place stress on State and private rangelands. New water would need to be developed, and severe overgrazing might occur on State and private lands if proper reductions are not made.

The elimination of grazing on public lands might also violate the intent of the Taylor Grazing Act. Under the Code of Federal Regulations the cancellation of grazing privileges would be subject to legal rights of appeal.

Agriculture. Most ranch operations in the ES area are independent of the farming operations, and farming operations would not feel significant effects from the elimination of grazing on public lands. The number of local calves available to feedlots and irrigated pastures would decrease, and the market for feed crops might be depressed. Less salt and supplement would be purchased for range livestock, which might decrease sales for livestock feed stores. Moreover, fewer cattle would be available for local livestock auctions.

Mineral Resources. Limited access might hamper prospecting on public lands.

Vegetation Products. With the exception of forage not harvested, the elimination of livestock grazing on public lands would not affect vegetation products.

Economic Conditions

The elimination of livestock grazing on public lands is expected to reduce the total income in the ES area by about $1,413,000. Payments made to the counties under the Taylor Grazing Act would be eliminated, amounting to about $31,000 annually. Declining property tax revenues on livestock would reduce annual income to the counties by about $34,000. Ranch values would decline by an estimated $20,070,000. Eliminating grazing on public lands would also adversely affect ranch employment. Many ranchers and hired help would probably seek employment to offset lost income, and they would thus depress the labor market.

LIMITED MANAGEMENT

Description

Under the limited management alternative, authorized livestock grazing would be adjusted to balance with the grazing capacity on all grazing units (see appendix B). Ephemeral management and deferment of grazing would be implemented as proposed. This alternative differs from the proposed action in that intensive livestock management would not be implemented, and only the range improvements necessary to implement deferment of grazing on the proposed areas would be initially constructed. Authorized livestock use would be adjusted, and ephemeral management and deferment of grazing would be accomplished as discussed in chapter 1. Five years would be required to implement this alternative. The following range improvements would be required:

fences--37 miles
pipelines--17 miles
water troughs--15
storage tanks--11

The proposed detention dams for erosion control and sediment retention on the San Simon River would be constructed as soon as possible.

After implementation of this alternative action, range improvements would be constructed as needed for the orderly use of the range, for the protection of major investments, and for the protection of rapidly deteriorating resources. Impacts of such improvements are not considered here because specific projects that might be needed cannot be anticipated. Impacts of various range improvements would be similar to those discussed for the proposed action.

Impact Analysis

Impacts on areas under custodial, ephemeral, and deferred management would be the same as those described for the proposed action.

Soil and Water Resources

The reductions in livestock grazing would reduce the sediment yield from the present estimated 2,330 acre-feet per year to 2,220 acre-feet per year. The construction of the proposed detention dams would reduce sediment yield by another 660 acre-feet per year, making the total sediment yield 1,560 acre-feet per year. Project construction would disturb approximately 140 acres of soil.

Soil problem areas identified in chapter 2 would improve slightly with the livestock reductions and the construction of the detention dams. Areas in a critical or severe erosion condition class would decline from the present estimated 264,787 acres to 250,000 acres.

Water quality would improve slightly with the decrease in sediment yield.

Vegetation

The limited management alternative would benefit vegetation. In 15 years an estimated 80,000 acres would be in excellent condition, 300,000 acres in good condition, 1,240,000 acres in fair condition, and 726,062 acres in poor condition. Ground cover would increase by an estimated 45 percent, and forage production would rise from the present 116,989 AUMs for livestock and wildlife to an estimated 125,289 AUMs.

Range trend would be expected to stabilize or improve where the trend is presently declining. As preferred livestock use areas, riparian areas and desert washes would remain in poor condition. Only riparian areas proposed for livestock deferment would improve.

This alternative would not affect threatened or endangered plant species.

Animals

Competition between livestock and wildlife for food would generally be reduced under limited management. The most significant changes in competition would occur in areas less preferred by cattle, in the proposed ephemeral areas, and in areas deferred from grazing. The deferred riparian areas would become better wildlife habitat. Areas near water now considered poor wildlife habitat would remain poor. The Barrier, Tanque, and Slick Rock dams would create highly productive habitats for many wildlife species after rehabilitation and revegetation. Wildlife populations are expected to increase slightly (see table 8-1).

Mule Deer. At the lower elevations deer habitat is in poor to fair condition. These areas are preferred by livestock and thus would improve very little. The reduction of livestock grazing pressure would improve deer habitat at the higher elevations and away from waters. Areas near water would remain as poor habitat.

Competition for palatable plants desired by both livestock and deer would be significantly lessened in areas less preferred by livestock. On areas preferred by livestock, competition would remain. Mule deer populations would be expected to increase slightly.

White-tailed Deer. Habitat conditions would improve within white-tailed deer range, most significantly in the Dos Cabezas Mountains. The range of the whitetail would not increase at its lower elevations, but populations are expected to increase within its present range.

Javelina. Reducing livestock numbers to carrying capacity would nearly eliminate competition for food between livestock and javelina and would maintain javelina habitat in good condition.

Antelope. Impacts on the antelope herd would be insignificant.

Bighorn Sheep. Bighorn sheep and livestock would continue to heavily compete in the relatively small but important area of public lands in Aravaipa Canyon Primitive Area.

Large Predators. Impacts on large predators would be minimal, although large predator numbers might increase slightly due to increases in numbers of prey.

Small Game. Small-game habitat would improve on areas where ground cover would increase. Small game-livestock competition for annuals would be eliminated on the proposed ephemeral ranges except during high production years when livestock use would be authorized. Those areas remaining in poor range condition would continue to be poor small-game habitat.

Insects. The effects of the use or nonuse of the various grazing systems on insect densities is not known. If intensive management would result in the maximum vegetation growth, then the insect densities under limited management would be lower than those anticipated under the proposed action.

Natural History Resources

The impacts of these limited-management alternatives on paleontological and geological resources would be the same as under the proposed action.

Cultural Resources

Under the limited management alternative, livestock grazing would have the same impact on cultural resources as would the proposed action. Fewer range improvements would be constructed under this alternative resulting in slightly lower adverse impacts, similar to the existing impact of building such structures on cultural resource sites. The possible adverse effects of constructing detention dams would be the same as for the proposed action as would the indirect impacts of erosion. Erosion under this alternative would have a low adverse impact on cultural resources in contrast to the moderately adverse impact experienced at present. As under the proposed action and at present, the disturbances of vandalism and visitor use resulting from the limited management alternative would be negligible.

The proposed actions, stipulations and other mitigative measures would be implemented as under the proposed action, and the unavoidable adverse impacts would also be of the same degree:

livestock grazing	low, adverse
range improvements	negligible, adverse
detention dams	high, adverse*
mitigative data recovery	negligible, adverse
erosion	low, adverse
vandalism and visitor use	negligible, adverse

*Possible degree of impact

Aesthetics

Impacts, mitigating measures, and unavoidable adverse impacts of the limited management alternative would be similar to those discussed for the proposed action. The number of range improvements necessary to implement this alternative, however, would be considerably less than that required for the proposed action. As a result, modification of the naturalistic landscape would not be as severe.

The proposed improvements would be located in VRM Class IV and would comply with quality objectives established for that area. An exception would be the fences and water developments necessary to implement deferment of grazing by Mescal Creek. These improvements would be within the Mescal Mountain grazing unit, #119, which is classified as VRM Class I. These improvements would not be compatible with VRM objectives.

The removal of livestock from riparian habitats proposed for deferment would enable streamside vegetation to become reestablished, thus improving the area's visual quality. Moreover, this alternative would reduce the potential for soil movement and result in less disturbance to the landscape from erosion.

Under the limited managment alternative, the proposed research natural areas (RNAs) would be grazed, and livestock reductions would have the same low beneficial impacts as expected from the proposed action. The management objectives of the RNAs, however, would not be met.

Deferment of livestock grazing for 3 to 5 years would have the same beneficial impact in the Gila Box Outstanding Natural Area (ONA) and Bonita Creek ONA as described for the proposed action. When grazing is resumed, livestock use would be adjusted to carrying capacity. The Gila Box and Bonita Creek ONAs would be fenced to prevent grazing of the bottom lands (preferred by livestock) in conjunction with the uplands. This alternative would allow range condition to remain the same or improve slightly and would have a low beneficial impact. To defer grazing in the Gila Box ONA, 4 to 5 miles of pipeline, two troughs, and one well would be constructed. These improvements would have a moderately beneficial impact.

The limited management alternative would have the same beneficial impact upon the Eagle Creek ONA as would the proposed action.

Livestock would graze the riparian areas of the Fishhook Canyon, Markham Canyon, and Johnny Creek ONAs in conjunction with the uplands. Being preferred by livestock, the riparian areas would be overgrazed. Range condition would remain fair to poor. Limited management would have a moderately adverse impact upon the natural values of the ONAs.

Land Uses

Recreation.

Designations. Deferment of livestock grazing for 3 to 5 years would have the same beneficial impacts on the Gila Box Wild and Scenic River Study Area as would the proposed action. Then, livestock use would be adjusted to carrying capacity. Range condition would remain the same or improve from the condition achieved after deferment. The wildlife, especially birdlife, and scenic values would improve. This alternative would enchance the value of the study area as a wild and scenic river and would have a moderately beneficial impact.

Facilities. The impacts of the limited management alternative on facilities would be the same as those under the proposed action.

Recreation Uses, Use Areas, and Amounts.

Fishing. The impacts of the limited management alternative on fishing would be the same as of the proposed action.

Hunting. The limited management alternative would slightly improve or maintain the present condition of the wildlife habitat for deer, javelina, mountain lion, dove, quail, and cottontail rabbits. Population increases, which would improve hunting quality, are expected to be in the lower half of the range identified in the proposed action for deer (710-1,150) and javelina (415-615). The increases, however, would be insufficient to change the hunting quality of any areas. The present population of mountain lion would not change appreciably. Slight population increases in dove, quail, and cottontail rabbits would occur.

Larger deer and javelina populations would increase visitor use in the lower half of the range identified in the proposed action (379-591 visitor days). The amount of visitor use for mountain lion, dove, quail, and cottontail rabbits would not change.

Water Sports--Floatboating. The impact of the limited management alternative on floatboating would be the same as under the proposed action.

Sightseeing. Deferment of grazing for 3 to 5 years in the Gila Box and along Bonita Creek would have the same beneficial impacts as identified for the proposed action. When grazing is resumed, it would be adjusted to carrying capacity. Range condition would improve or remain the same as achieved during deferment of grazing. Birdlife would increase two to eight times, improving the sightseeing recreation value from Class B to Class A. Visitor use, however, would not change significantly.

Riparian habitat, (which affects bird populations and diversity) in Fishhook Canyon, Markham Canyon, and Johnny Creek would remain in poor condition. Adjustment of livestock use to carrying capacity would only slightly improve the riparian areas because livestock prefer riparian areas for grazing and they would continue to overgraze these areas. Birdlife would increase slightly or retain its present populations and diversity. The Class C sightseeing recreation value would not change.

Use Problems. Under limited management the same conflicts would occur between ranchers and recreationists as are anticipated under the proposed action.

Livestock Grazing. Under the limited management alternative, intensive livestock management would not be implemented. Areas of livestock concentration would be excessively grazed, whereas forage would be wasted in other areas where livestock rarely graze. Preferred plants would be grazed repeatedly with no chance of rest to regain vigor. Therefore, the increase in the carrying capacity of the ES area in 15 years is estimated to be about 3 percent less under limited management than the increase expected under the proposed action. With the anticipated increase in forage production over present production, percent calf crops are estimated to increase by 8 percent. Calf weaning weights and cull cow weights would increase by 30 pounds, and death loss would decrease by 2 percent. (See table 8-1).

Agriculture. The number of local calves available to feedlots and irrigated pastures would increase. Most farm operations in the ES area, however, are independent of ranches and would not be significantly affected.

Mineral Resources and Vegetation Products. Neither mineral resources nor vegetation products would be affected by the limited management alternative.

Econmic Conditions

The limited management alternative would eliminate the intensive management of the proposed action, and its economic benefits would be less than under the proposed action. Direct and indirect income from livestock operations are expected to increase by about $270,000 annually for the ES area. Revenues from Taylor Grazing Act fees, however, are expected to decline by $9,900 annually, and property tax on livestock is expected to decline by $11,000 annually. The limited management alternative is estimated to decrease ranch values by $6,400,000. It would result in little long-term change in employment.

FIFTY PERCENT GRAZING CAPACITY WITH ADJUSTABLE STOCKING RATES

Description

This alternative would establish a permanent low base herd figure at 50 percent current estimated grazing capacity on all grazing units. Initial stocking would be set at the low base herd figure of 57,430 AUMs. This livestock level could be carried in the early years of implementing the AMPs, even during the poorest years of forage production. Using standard BLM procedures and techniques, BLM personnel would annually evaluate the range to determine the number and season of additional temporary livestock use above the base herd figure. BLM would make no upward adjustment in numbers, however, until one grazing cycle is completed.

The additional temporary livestock numbers would be based on available forage, condition of the range, and the condition of other resources. The upward adjustment in stocking would never exceed the stocking rate at the pasture level capacity. The stocking level could fluctuate from 50 percent of the grazing unit capacity to 100 percent of pasture capacity. Livestock and wildlife would never utilize more than 50 percent of key management species.

This alternative's implementation period, grazing systems, ephemeral grazing, deferred grazing, and range improvements would be the same as the proposed action's.

Impacts

Soil and Water Resources

The adoption of the 50 percent grazing capacity alternative would benefit soil and water resources. The reduced livestock stocking rates would allow an increased vegetation recovery rate, which would aid in reducing sediment yield. The implementation of the livestock grazing portion of this alternative would reduce sediment yield from the present 2,330 acre-feet per year to an estimated 2,040 acre-feet per year. The construction of the three detention dams would reduce sediment yield by another 660 acre-feet per year for a total sediment yield of 1,380 acre-feet per year.

The same amount of soil disturbance (739 acres) would occur under this alternative as under the proposed action, but recovery could be expected somewhat faster with lower stocking rates.

Vegetation

The reduced stocking levels would aid in the initial implementation of the AMPs. Since most allottees' livestock use the entire grazing unit, forcing cattle into pastures that have already been grazed to implement a rotation grazing system would place extra stress on the vegetation during the first grazing cycle. This alternative would alleviate this initial problem. Use of forage plant species would be less (estimated to average 25 percent rather than the proposed action's average of 40 percent).

In 15 years the estimated range condition would be as follows: 108,000 acres in excellent condition, 315,000 acres in good condition, 1,212,000 acres in fair condition, and 711,062 acres in poor condition. Vegetation production would increase to 131,226 AUMs annually, but livestock would use only 57,430 AUMs. After AMP implementation, additional temporary AUMs of livestock use would be allowed up to the 129,098 AUMs expected to accrue through improved range conditions. Utilization of key forage species would not exceed 50 percent of the current year's growth, and authorized livestock use above 57,430 AUMs would be temporary and based on availability of forage.

Increase in ground cover of 55 percent would be reflected by the expected improvement in range condition.

Threatened or endangered plant species would not be affected by this alternative.

Animals

The initial stocking rate of 50 percent of estimated carrying capacity would be especially beneficial during the early implementation stages of AMPs and during years of poor plant productivity. By the initiation of AMPs at the lower level of stocking, grazing schedules would not have to be broken. The combination of scheduled rest and low utilization should allow the range to recover initially at a more rapid rate than would occur under the proposed action. Having smaller base herds would facilitate making adjustments during drought to provide additional protection for stressed range plants.

This alternative, provides that use would fall below 50 percent; it would average an estimated 25 percent. The impacts of this alternative would thus be similar to, but slightly more beneficial than the proposed action, under which utilization would average 40 percent (see table 8-1).

Natural History Resources

The impacts of this alternative on natural history resources would be the same as for the proposed action.

Cultural Resources.

The reduction of livestock grazing to a low base of 50 percent grazing capacity would significantly reduce the impact of livestock trampling. This reduction would be slightly greater than that expected under the proposed action.

The direct and indirect impacts of range improvement construction (increased erosion and vandalism) and measures needed to mitigate these impacts would be the same as under the proposed action. The adverse effects of general erosion would decrease an insignificant amount over that of the proposed action.

Impacts under this alternative would be mitigated in the same manner as for the proposed action and the unavoidable adverse impacts would be of the same degree:

livestock grazing	low, adverse
range improvements	negligible, adverse
mitigation	negligible, adverse
detention dams*	negligible, adverse
erosion	low, adverse
vandalism and visitor use	negligible, adverse

*Possible degree of impacts

Aesthetics

The 50 percent stocking rate alternative would have the same impact on visual resources as the proposed action, providing that visual resource management procedures are followed.

Primitive Values

The impact of this alternative on natural and primitive areas would be the same as under the proposed action.

Land Use

Recreation. This alternative would have the same impacts on recreation as would the proposed action.

Livestock Grazing. The 50 percent grazing capacity alternative differs from the proposed action in that, under it, the base herd of livestock on each grazing unit be half the size allowed under the proposed action. Supplemental grazing would be authorized when BLM personnel determine that additional forage is available and that utilization of the key species would not exceed 50 percent in the grazed pasture. Under the proposed action, utilization of key species during a dry year might reach 60 percent. Under this alternative, the period for implementation of intensive grazing systems and ephemeral and custodial grazing would be the same as under the proposed action.

This alternative would result in about the same increase in carrying capacity as that expected under the proposed action. (See table 3-15, Analysis of Livestock Grazing.) With an increase in forage production, percent calf crops would increase by 13 percent; calf weaning weights and cull cow weights would increase by 50 pounds; and death losses would decrease by 5 percent.

Economic Conditions

Reduction of grazing to 5 percent of current estimated grazing capacity would reduce expected benefits from the proposed action even though production would increase more rapidly (in 12 years). Total income attributable to the livestock industry in the ES area is expected to increase by about $351,000 annually. Taylor Grazing fees paid to the counties are expected to decrease by about $11,400 annually. Reduced livestock tax base would be expected to reduce county revenues by about $12,400 annually. Ranch values would decrease by an estimated $7,400,000. Over the long run employment is not expected to differ from that under the proposed action.

CHAPTER 9

CONSULTATION AND COORDINATION

9

CHAPTER 9

CONSULTATION AND COORDINATION

TEAM ORGANIZATION

A team consisting of diverse resource specialists from BLM's Arizona State Office and Safford District office was assembled on October 4, 1976, in Safford, Arizona. BLM's Washington Office and Arizona State Office provided periodic review throughout the writing of the draft Environmental Statement (DES). The same team prepared this final Environmental Statement (FES).

CONSULTATION AND COORDINATION IN PREPARATION OF THE DRAFT ENVIRONMENTAL STATEMENT

In preparing the DES, the Safford District office has carried out the following consultation and coordination measures:

(1) Safford District representatives contacted livestock operators personally during the preparation of Allotment Management Plans (AMPs) to obtain the operators' recommendations and to familiarize the operators with the contents of the AMPs.

(2) The New Mexico and Arizona State Historic Preservation Officers were informed by letter dated May 17, 1976, of the writing of the ES and were asked for comments.

(3) The Advisory Council on Historic Preservation has been contacted and has reviewed and commented on the ES.

(4) In compliance with the Fish and Wildlife Coordination Act, the Safford District advised the U.S. Fish and Wildlife Service (by letter dated April 27, 1976) of the writing of this ES and requested comments on endangered and threatened wildlife species. Formal consultation in accordance with the Endangered Species Act was accomplished.

(5) A news release was issued on October 21, 1976 to local and intrastate newspapers, notifying the public of the availability of an information packet explaining the purpose of the ES and requesting written comments. The information packet was sent to the following individuals and organizations during the period from October 28, 1976 to November 2, 1976:

Recipient of Packet	Number of Packets Sent
All livestock operators in the ES area	288
BLM Arizona State Multiple-Use Advisory Board	12
BLM Safford District Multiple-Use Advisory Board	10
Other Federal Agencies	7
New Mexico State and Local Government Agencies	4
Arizona State and Local Government Agencies	12
County Boards of Supervisors	7
U.S. Congressional Delegates	6
Regional Planning Organizations	6
Conservation Organizations	15
Arizona Cattle Growers' Association	1
Arizona Wool Growers' Association	1
Energy Groups	55
Recreation Organizations	58
Wildlife Organizations	7
News Media	25
Cultural Organizations	5
Universities	10
Civic Clubs	2
Water Utilization Organizations	4
Individuals	18
Total	553

The Safford District office received 19 written comments in response to the information packets.

In addition, the public has been kept informed of the ES's preparation and purpose through news releases issued for the BLM Arizona State Multiple-Use Advisory Board Meeting held November 9 and 10, 1976, in Safford and news releases for tours conducted by the BLM Safford District office of the San Simon Restorative Project.

Two representatives of the Environmental Protection Agency toured the San Simon Valley on November 18, 1976.

During preparation, BLM Safford District personnel discussed the ES at these meetings:

Arizona Cattle Growers Association; tour of the San Simon; March 30 and 31, 1976; 20 attendees.

Phoenix Gazette Reporter, DeWayne Smith and District staff; tour of San Simon; April 8, 1976; 5 attendees.

BLM Safford District Multiple-Use Advisory Board; tour of San Simon; April 28 and 29, 1976; 15 attendees.

Graham County Wildlife Federation meeting; May 19, 1976; 25 attendees.

Safford Rotary Club meeting; June 1, 1976; 60 attendees.

Dos Cabezas Ranchers meeting; June 10, 1976; 25 attendees.
Safford Lions Club meeting; August 4, 1976; 25 attendees.
Coronado Resource Conservation and Development Group; tour of San Simon; August 13, 1976; 35 attendees.
BLM Arizona State Multiple-Use Advisory Board meeting; November 9 and 10, 1976; 37 attendees.
Safford Kiwanis Club meeting; November 10, 1976; 20 attendees.
Coronado Resource Conservation and Development Group meeting; November 18, 1976; 30 attendees.
Safford Women's Club meeting; January 21, 1977; 30 attendees.
Tucson Rod and Gun Club meeting; February 22, 1977; 100 attendees.
Southern Arizona Environmental Council, San Simon Tour; March 5, 1977; 35 attendees.

COORDINATION IN THE REVIEW OF THE DRAFT ENVIRONMENTAL STATEMENT

Comments on the draft ES were requested from the following agencies and interest groups:

Environmental Protection Agency

Advisory Council on Historic Preservation

Department of the Interior

- Fish and Wildlife Service
- Bureau of Reclamation
- Heritage Conservation and Recreation Services
- Geological Survey
- Bureau of Mines
- National Park Service
- Bureau of Indian Affairs

Department of Agriculture

- Agricultural Stabilization and Conservation Service
- Forest Service
- Soil Conservation Service

Department of Commerce

Army Corps of Engineers

Congressional Delegations - Arizona and New Mexico

Arizona State Agencies

Arizona Agriculture and Horticulture Commission
Arizona Association of Soil Conservation Districts
Arizona Department of Health Services
Arizona Department of Library and Archives
Arizona Department of Property Valuation
Arizona Department of Public Safety
Arizona Department of Transportation
Arizona Indian Affairs Commission
Arizona Outdoor Recreation Coordinating Committee
Arizona Resource Information Systems
Arizona State Clearinghouse
Arizona State Museum
Arizona Water Commission
Advisory Commission on Arizona Environment
Mineral Resources Department
Selected State Legislators
Bruce Babbitt, Governor of Arizona
State Land Department
State Game and Fish Department
State Parks Board
State Historic Preservation Officer

New Mexico State Agencies

New Mexico Central Clearinghouse
New Mexico Land Office
New Mexico Department of Game and Fish
New Mexico State Parks and Recreation Commission
New Mexico State Historic Preservation Officer
New Mexico State Planning Office
Selected State Legislators

County Commissioners

Cochise County, Arizona
Graham County, Arizona
Greenlee County, Arizona
Gila County, Arizona
Pima County, Arizona
Pinal County, Arizona
Hidalgo County, New Mexico
Grant County, New Mexico

Educational Institutions

Arizona Archaeological Center
Arizona College of Technology
Arizona-Sonora Desert Museum
Arizona State University
Central Arizona College
Colorado State University
Eastern Arizona College
New Mexico State University
Northern Arizona University
Northwestern University
Iowa State University
University of Arizona
University of Pittsburgh
University of Wisconsin
U.S. Air Force Academy

Conservation Organizations

Amerind Foundation
Arizona Conservation Council
Arizona Wilderness Coalition
Arizona Wilderness Study Committee
Arizonans in Defense of the Environment
The American Scenic and Historic Preservation Society
Environmental Consciense, Inc.
Environmental Clearinghouse
Friends of the Earth
Isaac Walton League of America
National Association of Conservation
National Council of Public Land Users
Natural Resources Defense Council, Inc.
The Nature Conservancy
New Mexico Wilderness Study Committee
Pacific Legal Foundation
San Simon Restoration Committee
Sierra Club
Soil Conservation Society of America
Southern Arizona Environmental Council
Wilderness Society

Wildlife Organizations

Arizona Desert Bighorn Sheep Society
Arizona Wildlife Federation
Arizona Wildlife Society
Audubon Society

Wildlife Organizations (cont.)

Defenders of Wildlife
Friends of Animals, Inc.
Graham County Wildlife Federation
New Mexico Ornithological Society
New Mexico Wildlife Federation
New Mexico Wildlife Society
Wildlife Management Institute

Recreation Organizations

Arizona State Four-Wheel Drive Association
National Campers and Hikers Association
ORV Monitor
Road and Trail Association, Inc.
Southern Arizona Biking Club
Tucson Four-Wheelers

Livestock Organizations

Arizona Cattle Growers' Association
Arizona Wool Growers' Association
Cochise-Graham County Cattle Growers' Association
New Mexico Cattle Growers' Association
New Mexico Farm and Livestock Bureau
New Mexico Farm and Ranch
Rio Puerco Livestock Association
Southern New Mexico Grazing Association
West Central Grazing Association

Other Economic Entities

Caldwell Banker Company
Energy Impact Associates
David D. Smith and Associates
Southwestern Environmental Consultants
Don Thacker and Associates
Wildan Associates

Others

League of Arizona Cities and Towns
New Mexico Coordinating Council
Public Land Council
San Carlos Irrigation and Drainage District
Society for Range Management
State Conservation Commission

Copies of the ES were furnished to all livestock operators in the ES area; newspapers, radio and television stations; repository libraries as well as local libraries; and individuals who requested copies.

PUBLIC COMMENTS ON THE DRAFT ES

The draft ES (DES No. 78-13) was filed with the Environmental Protection Agency on April 25, 1978 and released to the public. The notice of availability was published in the April 26, 1978 issue of the Federal Register. The notice announced a public review period ending June 19, 1978 and included a schedule for public hearings in Safford, Tucson, and Phoenix. The public comment period was provided to allow the public to review and comment on the adequacy of the proposal and its alternatives.

The Washington BLM Office provided approximately 700 copies of the draft to Federal, State, and local government agencies, nongovernment groups, and individuals for their review and comment. The Federal Register also listed the location of reading copies available for public review and information on how to obtain a copy of the draft statement. In addition, the Department of the Interior, Washington, D.C. issued a national news release and the BLM Arizona State Office issued a similar news release to media within Arizona.

PUBLIC HEARINGS

Four public hearings were held for the draft ES. An Interior Department administrative law judge presided over the hearings, which were recorded verbatim by a professional court reporter. The hearing panel consisted of BLM staff.

The hearing locations, dates and time, attendance and the number testifying are as follows:

Location	Time & Date	Attendance	Number Testifying
Safford	5/23/78 7:00 P.M.	32	6
Tucson	5/24/78 7:00 P.M.	14	0
Phoenix	5/25/78 1:00 P.M.	4	0
Phoenix	5/25/78 7:00 P.M.	4	2

HANDLING OF PUBLIC COMMENTS AND REVIEW PROCEDURES

All written comments and the hearing transcripts have been sent with the final ES to the Secretary of the Interior. They are also available for inspection at the Arizona State Office, Phoenix, Arizona and the BLM District office, Safford, Arizona.

BLM staff members reviewed and considered individually all written and oral comments. They responded to and made appropriate text changes for all comments that presented new data, questioned facts or analyses, or raised questions or issues bearing directly upon the environmental effects of the proposal and the alternatives. They did not respond to comments failing to address the adequacy of the draft ES. Hearing comments that require a response have been extracted and are directly quoted from the hearing transcripts.

Although the public review period ended on June 19, 1978, comments subsequently received were addressed until July 7, 1978. BLM will not respond to letters received after this date but will consider them in decisionmaking. All written comments received through July 7, 1978 are reproduced in this chapter. The letters are numbered in the order they were received.

INDIVIDUAL COMMENTS AT PUBLIC HEARINGS

May 23, 1978 -- Safford, Arizona

Speaker (Representing)

E.A. Browning (Cochise-Graham Cattle Growers)

1. Comment: "But I would like to see another hearing at a later date when we have had a chance to digest this because I'm sure it took you many, many hours and hours of work to compile it."

   Response: Letter from Safford District Manager to E.A. Browning

District Office
1707 Thatcher Boulevard
Safford, Arizona 85546

June 8, 1978

Mr. E.A. Browning, President
Cochise-Graham Cattle Growers Association
Route 1, Box 38-A
Elfrida, Arizona 85610

Dear Mr. Browning:

Your request at the public hearing held in Safford, Arizona on May 23, 1978, for extending the comment period on the Upper Gila-San Simon Draft Environmental Statement, cannot be accommodated.

Our ability to extend the review period for the statement is constrained by a recent Court Order. On April 14, 1978, Judge Flannery of the Federal District Court in Washington, D.C., ordered that the Upper Gila-San Simon Statement must be filed as a final by September 30, 1978. We will not be able to meet that deadline if the review period is extended.

I would truly like to extend the review period as you suggested, but it cannot be done and still meet our court-ordered deadline. However, I will be happy to meet with you or any of the livestock operators at any time to explain the ES and to get your input.

Sincerely yours,

Guy E. Baier
District Manager

2. Comment: "The first step was the method of computing the grazing capacities. One thing that as a cattle grower, in the statement you mentioned the use of transects, and I recall that you stated that they weren't all through the DES area although you anticipated possible use of them more extensive later on.

I think that the cattle man of the permit should be consulted as to location of transects because it's been my experience in the past that if these transects are placed in bad locations, they cannot give actually a true grazing capacity figure from them."

Response:

The transects used to portray range trend were located in the 1950's through the use of BLM's Parker three-step method for evaluating rangeland. As mentioned in the text, these transects were not randomly located and are useful as general information only on the status of vegetation trends in the ES area.

Range studies are necessary to evaluate the effects of grazing, and transects are located throughout the grazing units as a part of these studies. Range users are encouraged to participate in the establishment and the evaluation of the range studies.

3. Comment: "I think that there was no consideration of drought as opposed to wetter years in the statement. We all know that when we have years like we did this year, there is an abundance of feed in country that normally has very little if any feed.

A lot of this country is not perennial country, and I think it should be considered that when we do have annual feed, that it should be utilized to the best extent."

Response:

The ES mentions the effects of drought several times. The carrying capacity of each grazing unit in the ES area is based on perennial vegetation. Production by annual forbs and grasses was not calculated, since the production by these annuals in any one year is extremely erratic and unpredictable. Increases in forage production due to annuals can be recognized by the issuance of temporary nonreneawable permits by the authorized officer. Existing regulations provide for such permits.

4. Comment: "Soil type should be taken into more consideration because some of the area, the soil, actually in my estimation, will never produce very much feed.

There was a question in my mind that stated some areas that were ungrazed in the DES area at the present time still don't qualify as excellent, which points up the facts of what I was just stating: that some of these types of ranges and lands never will produce an abundance of forage."

Response:

The soil's potential productivity was considered in developing map 2-6. For example, soils in the limy upland range site in the 7-12 inch precipitation zone, have the potential to produce a plant community of 50 to 75 percent by weight of the current year's growth of creosotebush. These areas are now producing 75 to 100 percent creosotebush. They are consequently in a fair or good condition as compared to the soil's potential. Even though they are in a fair or good condition, they do not produce much forage available for livestock use.

5. Comment: "In the area of financing, we were wondering what the source of the quoted figures was, and also the cost/benefit ratio was little bit deep for a bunch of us cow punchers. We need a little more clarification along that line.

Also, we were wondering, really, how much of this land will justify the improvements that are anticipated and spoken of in this statement, because there's going to be quite a large sum of money spent on improvements. And being tax conscious and wanting to keep cost of taxes and what-not-down, we certainly want to oppose anything that is foolish spending when the actual area doesn't warrant the spending of big sums of money."

Response:

Information used in developing the benefit/cost analyses was taken from BLM data sources, other Federal agency studies, university studies and extension service figures. The benefit/cost ratio is simply the expected dollar benefits divided by the expected dollar costs for a given period of time. It is a tool used to judge the economic consequences of making an investment. It weights the costs against the monetary returns of an action. Costs and returns are adjusted to reflect the time of occurrence. For example, a dollar of income is worth more today than one payable in 5 years. (Sixty-eight cents deposited at 8 percent simple interest would be worth $1.00 in 5 years). A benefit/cost ratio of 1.5:1 means that each dollar invested will yield a return of $1.50. These calculations indicate whether the costs of improvements are justified economically.

6. Comment: "One question that I had--what is the qualifications of a resource specialist professional who, as I understand from reading this, will be the man that tells the cow man whether he can increase or has to decrease his herd if and when any of these programs are adopted."

Response:

Each resource specialist--range conservationist, soil scientist, hydrologist, etc. -- has to meet certain standards established by the Civil Service Commission for a given grade level. The following example covers some of the standards required for a Range Conservationist.

Qualification for Requirements for Range Conservationist: Candidates must demonstrate successful completion of the requirements in A or B:

A. A full 4-year course of study in an accredited college or university leading to a bachelor's or higher degree with major study in range management or a closely related subject-matter field. The study must have included at least 30 semester hours in any combination of the plant, animal and soil sciences, and natural resources management. At least 12 of these 30 semester hours must have been in range management.

B. Course work in an accredited college or university with major study in range management or range conservation or in a closely related subject-matter field that included at least 30 semester hours in subjects as specified in paragraph A plus enough additional education or range conservationist experience to total 4 years of education or 4 years of combined education and experience. The quality of such additional education or experience must have been sufficient to give the candidate technical knowledge equivalent to that normally acquired through completion of degree requirements as described in paragraph A above.

7. Comment: "Wildlife preferences--we want to know what the true ratio of forage consumption is of deer as opposed to livestock. There's been a lot of conflicting testimony from different areas as to the amount of actual competition between the deer and livestock."

Response:

The animal unit equivalent in AUMs varies from 4.0 to 5.5 for mule deer and from 4.5 to 7 for white-tailed deer. Thus, four to seven adult deer consume the same amount of forage as one cow-calf unit. The amount of direct competition between livestock and deer also varies, depending upon several factors: (1) the total amount of forage available vs. the number of livestock, deer, and other wildlife present; (2) the type of vegetation (i.e. grass, shrub, forbs); (3) vegetation species composition; (4) season of use; and (5) terrain. This ES used a straight ratio conversion of 5:1 for deer.

8. Comment: "Also, how much revenue does the game bring in to the BLM as opposed to the livestock industry? I think that we should keep in mind that one of the objects of running the government and what-not, I think it should be kept in mind that when you spend money, you should have money coming in to pay for it."

Response:

BLM does not receive revenue from game hunting. BLM is a multiple-use management agency and, as such, is under mandate to manage the public lands for wildlife and wildlife habitat as well as for livestock production, recreation, mining, and other values. Wildlife does, however, contribute to the local economy through the purchase of sporting goods, food, and gasoline for hunting, fishing, birdwatching and other wildlife oriented activities. The State also benefits from the sale of hunting and fishing licenses and from sales tax on the above-mentioned items. The Federal Government benefits from excise taxes on firearms and ammunition.

9. Comment: "There was a question in my mind. You listed deer numbers in the DES area at 4,200 mule deer, and 550 white-tailed deer. Then, quite a bit further back in the statement, it was listed that there were 12,300 and some licenses sold.

Now, it wasn't qualified as to what type of licenses these are. And in the statement, it said unequivacolly that game numbers would have to reach a maximum before there would be any consideration of livestock increase.

Well, if the ratio is 12,000-some deer licenses and they've only got 5,000-some deer and their kill percentage is 15 to 36 percent, which was quoted in here, you're never going to get maximum game on your DES area under those conditions."

Response:

The ES does not mention the total numbers of hunting licenses sold in the ES area. The 12,300 plus figure, apparently came from Table 2-18, which listed a "visitor use" figure of 12,350 for hunting. The table was confusing because it did not specify units, which are "visitor days". The table has been corrected to properly reflect units.

The interpretation that the proposed action would require game numbers to reach some maximum before any increase in livestock would be allowed is incorrect. Page 1-6 states the following: "For increases in AUMs expected to result from implementation of the proposed action forage would be allocated to wildlife up to the AG&FD optimum levels before increases in livestock use are allowed. Meeting anticipated needs of the optimum number of wildlife expected under the proposed action would require approximately doubling the present wildlife forage allocations."

10. Comment: "Also, you listed some areas were excellent for small game. And I was wondering why these areas were so excellent when there was grazing in this area when many places you state that the grazing was so detrimental to the small-game areas."

Response:

Normally only excessive grazing is detrimental to most small-game species. Scaled quail and Montezuma quail depend heavily upon perennial grass cover but can tolerate light to moderate grazing (up to 40 percent use) and still maintain healthy populations. Other species, including Gambel's quail and mourning dove can tolerate somewhat heavier livestock use and may actually benefit from shrub invasion, which may result. Excessive grazing has occurred over much of the ES area in the past, and excellent small-game habitat occurs mostly along the major drainages, where cover is most concentrated.

11. Comment: "Along the sightseeing, we wondered, do people really object to seeing cows on this range because you have designated two areas of strictly no livestock grazing whatsoever."

Response:

We assume this comment refers to the statement in chapter 3, page 3-62, Sightseeing. Which states that: "Deferment of livestock grazing for 3 to 5 years in the Gila Box... and Bonita Creek...

In chapter 1, we have proposed deferment for critical watershed areas along the San Simon River and critical riparian and aquatic wildlife habitat along several streams in the ES area, including the Gila Box and Bonita Creek. Livestock grazing would be deferred for a minimum of 3 to 5 years but then might be allowed in accordance with the criteria listed on pages 1-24 and 1-25.

12. Comment: "We were wondering about the cost of administration of these areas because there will be -- wondering if there would be any revenue derived from these areas whatsoever. How much tax dollars is it going to cost to keep these areas up for sightseeing or whatever other uses that you might determine while you are excluding the livestock industry."

Response:

No areas are proposed for excluding livestock purely for the benefit of sightseers or any other single purpose. The areas proposed for the deferment of livestock use are proposed to protect and enhance wildlife and watershed values. Costs for administering these areas for other resource values would be minimal. Only slightly more than 14,000 acres out of more than 2.8 million are proposed for deferment. (Also see response to comment #11).

13. Comment: "We also wondered about energy consumption. All uses that I know of as far as using the DES, all of them are very heavy energy consumptive types of uses, like your four-wheel drives, which are your hunters and your dune buggies and so on and so forth.

I don't think that going real strong on areas of sightseeing and what-not is really along the guidelines of the government trying to save energy."

Response:

The purpose of the ES is to analyze the effects of livestock grazing on the environment, not to analyze the energy consumption of various lifestyles. Livestock grazing is also a consumptive use of energy. Published studies indicate that more than 700 pounds of forage are needed to produce 100 pounds of beef. Poultry and swine are more efficient energy converters than beef cattle.

Livestock producers also use energy, for transportation, medicines, maintenance and improvements, and allotment supervision. (Also see comment #24).

14. Comment: "Also, there was no mention anywhere in the statement of the welfare of the people directly affected in this DES area. And I think that this should be a considereration because you have people, some of them are second and third generation, that have derived their living from the land. Even though it's not all BLM land, they're in a position that they can't go on producing and making their living because the majority of their property or a good percentage of their property is government-owned land."

Response:

The welfare of the people directly affected by the proposed action is discussed in chapters 2 and 3 under Economic and Social Conditions.

15. Comment: "The next question we wanted to ask, are you cooperating with the State Land Department in your management plans? If so, we would like to know what the negotiations are with the State Land Department because you are including many, many acres -- I think 600,000 and some acres of State land and State and patented land are included in this DES area."

Response:

Personnel from the State Land Department visited the ES area and discussed all new AMPs containing State land with Safford District personnel. The State Land Department has also been given copies of each new AMP in the ES area. We have not received any official comments from the State Land Department concerning AMPs. (Also see State Land Department letter #9).

16. Comment: "We object to the alternatives listed when there are many other alternatives that are not listed. You listed only three alternatives to your proposal. And I think that all of us should be open to negotiations and get down to brass tacks and work with the permittee, hear his views with an open mind an give him a complete consideration of what he has to say."

Response:

BLM will continue to negotiate with ranchers over aspects of their particular AMPs. The comment mentions other alternatives but doesn't present any for response. We believe that the four alternatives discussed in the ES do present a range of options for consideration in the decisionmaking process.

Len Mattice (self-rancher)

17. Comment: "So I think we're on the wrong premise when we say that all the ranges are going downhill. Admitted, there will be a few cooperators there taking advantage of the situation, but, then, they should be treated individually and not collectively as this statement tends to do."

Response:

The ES has not stated that all ranges are going downhill. Each grazing unit was evaluated individually as part of the AMP development process.

Many of our grazing units are in a static trend, but the vegetation composition is not what is desired. Some of the grazing units have an upward trend in range condition.

18. Comment: "What we're doing here is driving the straight livestock man completely out of business. If we continue to harp on him and to reduce him 50 percent or 60 percent, all were doing is driving him into the city looking for a job and looking for further income because he cannot make it with the present allotments, much less reducing them more."

Response:

If the proposed action is adopted, some allottees may go out of business. Evaluating how severely individual ranches would be impacted is difficult without specific knowledge on the rancher's financial position, which would include outside employment of the rancher or members of the rancher's family.

19. Comment: "And we doubt that the proposed improvements can be properly financed."

Response:

We expect the proposed range improvements to be funded if the proposed action is accepted.

The proposed improvements will be financed through Federal and private funds. Federal funding would be made available through specific authorization by Congress and with range improvement funds.

20. Comment: "The deer cannot also in this area increase in population if they're going to continue to increase the population of the coyote. There is no way that the deer population can increase if we continue to increase the predators on those game animals."

Response:

Many factors interact to control or limit deer populations. Predation, especially coyote predation, is one of these factors in parts of the ES area. Predation will continue to limit deer populations, regardless of adjustments made in livestock grazing. Reduced deer-livestock competition and improved water distribution, as proposed in the ES, however, should allow deer numbers to increase.

21. Comment: "May I suggest that if we must have range management plans, that the individual range be evaluated on its own merits with the cooperator there and under present conditions, present factors and be given a number of years to prove itself, rather than to take the premise that it is already bad and we're going to make it better."

Response:

The current conditions of the rangeland in the ES area are a result of the cumulative effects of climate and livestock grazing practices, particularly historical abuse (before 1900).

We will continue to work with the individual operator in developing range studies and implementing AMPs.

Alan Day (self-rancher)

22. Comment: "I hope that the proposed document is not cast in concrete already and that there is room for negotiation and that there is room for change and that there is room for input that has meaning."

Response:

The ES is not the decisionmaking document. It analyzes the environmental impacts of the proposed action and its alternatives. After the final ES is filed, the decisionmaking process will begin. Environmental concerns will be considered along with the social, economic, and technical considerations in formulating a series of decisions. We will continue to work with individual allottees in considering and developing new information and in reaching final decisions.

23. Comment: "I would like specific provision written in or to be allowed on the ranges that are designated and have been designated as perennial ranges. A great number of these ranges in certain years have also a very large amount of annual production.

And I would like to see that annual production recognized for its ability to produce pounds of protein. And I would like -- you people will have to structure it in the way that you choose--but I would like to see on the perennial ranges a base number of cattle which you have proposed. And then an additional number of cattle on years such as this spring that we're just going through when there's a huge volume of annual production, I would like to see a number that people know that they could count on in this kind of a year to take advantage of and ease the financial burden a little bit and take advantage of the annual production because the annual production has some value in laying there on the land. But it also has a lot of value to harvest part of the annual production. And I think we would really miss the boat if we didn't do that."

Response:

Temporary increases in annual production can be authorized under existing regulations, in the form of a temporary nonrenewable license. (Also see response to comment #3).

24. Comment: "I would like to see some studies included on the energy cost of the use of this land. And I feel that this is something that is really lacking.

We're faced with our Congress in the very near future making a national energy policy. We read it in all the newspapers. We read it in all of our periodicals. Mr. Carter makes speeches about an energy policy.

And we will have an energy policy, good or bad or whatever. We will have a national energy policy before too long.

I feel it is very important in any impact statement to designate, to have studies showing what energy -- what in terms of energy it costs to use the various uses. How much energy is required to raise a pound of protein in the form of a cow? How much energy is required to use it for recreational purposes? To use it for hunting? To use it for mining?

And this can and should be done. And I think it should be recognized. I'm quite confident that once the results come out, that the single, cheapest form of protein in terms of pounds of protein available to the consumer comes off of our public ranges and our combination of public and State ranges in terms of energy costs.

It costs less energy to produce a pound of beef on a desert range and a public range than any other protein of equal quality. And I think that those studies should be made and should be included in this."

Response:

Cook (1977) reported that beef cattle convert only 4 percent of the gross energy in feed to food energy for man. Poultry converts 12 percent and swine convert 17 percent. In a strict energy conversion sense, the beef cow doesn't compare well. Mr. Cook also wrote that "the efficiency of animals to convert plant life into animal products for human food is becoming a primary consideration because of the high prices of food". "Certainly meat can be produced more effectively if we select more efficient plants and animals and practice better management techniques."

"It has been shown that cattle are 64 percent as efficient as sheep and sheep are 47 percent as efficient as rabbits when compared under range condition on a sustained yield basis."

25. Comment: "I would like to know and didn't see any references in there, although they may be there, where a lot of your information came from and do you have economists on your staff that are versed in economics of ranching and have you taken advantage of any of the studies that any of the various western universities have used and have put out on the cost of doing business on public ranges."

Response:

In chapters 2 and 3 data sources have been cited. The ES also contains a complete list of references.

BLM hires qualified economists in accordance with Civil Service Commission standards. The staff economist responsible for the economic section of this ES has had 14 years of experience in farm and ranch economics. He has reviewed university studies on ranch operations, but has not used all studies in conducting his analysis. Studies used are citied in the text and listed in the reference section.

May 24, 1978 -- Tucson, Arizona

May 25, 1978 (1:00 P.M.) -- Phoenix, Arizona

No speakers appeared at these two hearings.

May 25, 1978 (8:00 P.M.) -- Phoenix, Arizona

John Olson (Executive Vice-President, Arizona Cattle Growers Association)

26. Comment: "My statements will be brief and directed toward one point primarily, and that is that cattlemen in Arizona now, more than any other time of the year, are as busy as they possibly can be because they're rounding their cattle up.

That, coupled with the simple fact that most of the affected cattlemen in the Upper Gila-San Simon area did not receive their copies of the environmental Statement until the 15th of May or later, prompts us to formally protest the period of time with which we've had to prepare statements for this hearing tonight as well as the one in Safford and the one in Tucson."

Response: Letter from State Director to John M. Olson

Bureau of Land Management
Arizona State Office
2400 Valley Bank Center
Phoenix, Arizona 85073

May 25, 1978

Mr. John M. Olson, Executive Vice President
Arizona Cattle Grower's Association
2538 E. University Drive, Suite 170
Phoenix, Arizona 85034

Dear John:

Your May 16, 1978 request for extending the comment period on the Upper Gila-San Simon Draft Environmental Statement cannot be accommodated.

Our ability to extend the review period for the statement is constrained by a recent Court order. On April 14, 1978, Judge Flannery of the Federal District Court in Washington, D.C., ordered that the Upper Gila-San Simon statement must be filed as a final by September 30, 1978. We will not be able to meet that deadline if the review period is extended.

As you know, we have arranged for public hearings in Safford, Tucson, and Phoenix. The Safford and Tucson hearings were scheduled for 7:00 p.m., and the Phoenix hearing for both 1:00 and 7:00 p.m., to allow the public maximum opportunity to provide input into the Final Statement.

I would truly like to extend the review period as you suggested, but it cannot be done and still meet our court-ordered deadline. However, we will be happy to meet with you or any of the livestock operators at any time prior to June 19, to explain the ES and to get your input. If you would contact Guy Baier, the District Manager, he will be happy to arrange for these meetings.

Sincerely,

Robert O. Buffington
State Director

WRITTEN COMMENTS AND RESPONSES

This section includes all written comments on the ES received by July 7, 1978 and responses where appropriate.

Advisory Council on
Historic Preservation
1522 K Street N.W.
Washington, D.C. 20005

ARIZONA STATE OFFICE
BU. LAND MANAGEMENT
MAY 15 '78
SD
ASSOC. SD
PCS
RESOURCES
TECH SER
MGMT SER
PUB. AFF
CF
ACTION
INFO.
SEE ME

May 11, 1978

Mr. Robert Buffington
State Director, Arizona State Office
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

This is in response to your undated request for comments on the draft environmental statement (DES) for the proposed Upper Gila-San Simon Grazing management program, Arizona and New Mexico. We have reviewed the DES and note that the undertaking will affect Fort Bowie National Historic Site and the Kearny Campsite and Trail, properties included in the National Register of Historic Places and numerous other historic and archeological properties that may be eligible for inclusion in the National Register.

1-1

Pursuant to Section 106 of the National Historic Preservation Act of 1966 (16 USC 470f, as amended, 90 Stat. 1320) Federal agencies must, prior to the approval of the expenditure of any Federal funds or prior to the granting of any license, permit, or other approval for an undertaking, afford the Council an opportunity to comment on the effect of the undertaking upon properties included in or eligible for inclusion in the National Register of Historic Places. In addition, Executive Order 11593, "Protection and Enhancement of the Cultural Environment", issued May 13, 1971, requires Federal agencies to afford the Council an opportunity to comment on undertakings that would result in the sale, transfer, demolition or substantial alteration of cultural properties under their jurisdiction or control that are determined eligible for inclusion in the National Register.

Until the requirements of Section 106 and the Executive Order 11593 are met, the Council considers the DES to be incomplete in its treatment of historical, archeological, architectural and cultural resources. To remedy this deficiency, the Council will provide, in accordance with its "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800), substantive comments on the effect of the undertaking on these properties. Please call Michael H. Bureman at (303) 234-4946, an FTS number, to assist you in completing this process.

The Council is an independent unit of the Executive Branch of the Federal Government charged by the Act of October 15, 1966 to advise the President and Congress in the field of Historic Preservation.

Page 2
Mr. Robert Buffington
Fort Bowie NHS, Et.Al.
May 11, 1978

Your continued cooperation in this matter is appreciated.

Sincerely yours,

Michael H. Bureau

Louis S. Wall
for Assistant Director, Office of
Review and Compliance, Denver

Response:

1-1 We called the Advisory Council on Historic Preservation and learned that the Council had not located all relevant discussion in the DES because some mitigative measures, including clearance surveys and 106/1 (3), 2(b) compliance completion on range improvement projects, appear in chapter 1 rather than in chapter 4. We recognize our obligation to comply with cultural resource mandates. Consequently, we consider that the clearance procedures are not proposed mitigation but rather required measures that will be completed.

The Council agreed that we are in compliance to date. We will continue to coordinate our activities during the decisionmaking and implementation processes.

2

Arizona Cattle Growers' Association

Publishers of Arizona Cattle Growers' OUTLOOK

2538 East University Drive, Suite 170 • Phoenix, Arizona 85034 • Telephone 267-1129

May 16, 1978

Mr. Bob Buffington, State Director,
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Bob:

I have finally received my copy of the draft environmental statement of the proposed Upper Gila-San Simon Grazing Management program. I appreciate your staff's efforts in getting one to me after I called them.

I have checked with permittees in the affected study area and others in the livestock industry concerned with this study and they are now getting their copies too.

Which brings me to the point I want to make. The ES was released on April 27, and the deadline for comments is June 19. It's difficult enough to cover the 300 pages in the Draft and comment on it in that time; but since we didn't receive our copy until May 15, our problems are severely compounded. Additionally, the public hearings on the ES are scheduled for May 23, 24 and 25; and that allows us only eight days to read it and present sensible testimony at the hearings.

You've told us that the information developed from comments will be used to prepare the final ES. Do you really expect our industry and the livestock people in the Upper Gila-San Simon area to be able to knowledgeably comment on the ES in the time allotted?

2-1 I'd like to suggest that you grant additional time for comment in order to receive optimum imput from the ranchers in the affected area. At the very least some additional hearings would result in more imput. Most of the stockmen affected by this ES are in the middle of roundup and that, together with normal ranching duties, makes it nearly impossible for them to satisfactorily participate in the process under the shortened time limitations.

Page 2 letter to Bob Buffington from John M. Olson, May 16, 1978

Bob, I think you know how concerned we are with these Environmental Statements. To allow the little time you have for these stockmen to comment on their futures is really disasterous to this industry's interests. I hope you can do something to rectify the situation.

Sincerely,

ARIZONA CATTLE GROWERS' ASSOCIATION

John M. Olson

JMO:emo

John M. Olson,
Executive Vice President

CC: Fred Boice
Jim Coughlin
Herb Metzger
Alan Day

Response:

2-1 See response to hearings comment #26.

B.L.M.
Ariz State office.
Phoenix Ariz.
Dear Sir:
Here is my Comment on the impacts Statement.
I feel on omost all thing the invironmentest is in the wrong, they don't use vary little judgement with what they do.
1st Take the P.D. Mineing co. making them plant shubs around there tailing Dump & stuff like that, seem they or out to Break the free people of or Nation.
It seem more like Russia has already took over to most of the free american.
2nd To me, I have never heard any thing from the BLM & Invironmentist on any thing but cattle Camping

on green spots set.
Cattle has been here many many years, they or entitled to this land as much as people, Deer + wild game.
~~Us~~ Ranchers provide all the water + salt for the Game + Cattle.
I do know the BLM should have checked + stayed after many people, new commers for to many Cattle.
a lot of Rich people would run there limits plus 100 head or so.
We don't do those things at all or selves.
I do not feel on lot of BLM land that you will help regardless what you do, some you will.
I felt the Federal Gov. spent a lot of mony foolishly doing all they done.

But I know the Gov. hast to have something for all the colledge boys they have put to work to do.
There is around 100 to our district.
In Ariz. there is meny thing that host to be Controlled, Rabbits, Rats, ants, & brush, if it gets where you can't controll these things, look out.
Like myself if I closed off all waters on my Pat. Land, closed all R.D. I built & paid for out of my pocket on my Pat. land, then what would the State, BLM, Forest do, to me this whole thing can work two ways, with us cow men.
I do Controll my Pat. Land & will continue regardless what force It takes to do so.

I have never had any problems at all with the State, Forest, or BLM.
But I feel the BLM has gone enviornmentest also.
All these problem I feel has came from colledge people & faungers, that feels a cow man is getting rich off of the Gov. land, let them come & see.
The only reason we have it at all is because or four fathers & Dads took it up 100 years ago. there is vary little value in what we have on the Noland Ranch.
Also I feel its a shame to shot & wast wild cattle & Horses. they should be managed & some taken each year.
The wild cows don't hurt any more then a bunch of Deer that is of no value.

I can assure you, I know
of know Cow man that has made
much over expenses off of any Gov.
land.
I have went in the Whole the past
10 years, its very hard to make
money on Ranches.
I have fine Race Horses & other
things I depend on a lot for money.
Nearly all Cow men does the same
to be able to buy new cars & pickup
& live.
Thanks for the Book & letter.

The Horses or vary valuable to Mt Comtry, they will keep all springs pauled out + cleaned where water can come in, North of Tucson I have seen them dig wholes 6' deep to water, where Cattle + ~~Burros~~ Deer could drink also, that was on the rail X Ranch ~~North~~ of Tucson.

This Comtry need to make its on production of Metals, beef, + farming, the way it look we will depend on all imports in the nefst 10 years + look out if we ever get that bad. Just because of people that does not understand the nature of life + what the real things that should be done.

Sincerely
Albert C. Noland

Student Chapter
THE WILDLIFE SOCIETY
SUPO BOX 21082
UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

May 28, 1978

Bureau of Land Management
Arizona State Director (911)
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Sirs,

As President of The Student Chapter of the Wildlife Society, and temporary chairman of the Environmental Quality Committee, I would like to offer my comments on the proposed Upper Gila-San Simon Grazing management program.

After thoroughly going over this draft, it is obvious that a lot of time and effort have gone into this study. It appears that all phases of the environment have been covered to a high degree. From a pure wildlife standpoint, deferment of grazing is the best program. But this would be a very unreasonable suggestion. I do feel, however, that your proposal is in the best interest of all parties concerned, including wildlife. The longterm environmental impacts of your proposal are worth the short term impacts, and the area as a whole will be better..

Sincerely,
David Carrothers
David Carrothers
President

5

June 2, 1978

Mr. Robert O. Buffington
Arizona State Director
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

I have several comments and many questions I would like to direct to you in regards to the Draft Environmental Statement for the San Simon - Gila Valley.

5-1 Having reveiwed the draft I question your source of statistics. Were the formula's used a creditable method of determing various needs for this area? What is a "Cost Benefit Ratio" as used in the draft? What are the credentials of a "Resource Specialist Professional?

5-2 It is evident that much of the public lands will not justify additional costs and improvements. The soil types and the kinds of forage available will never allow for an Eden that you seem to be trying to achieve. However, I feel that if you will allow the permittee an opportunity to prove his management program instead of assuming that he is not capable of sound management practices then something in between Eden and what we have now can be accomplished. But it will take much hard work and cooperation between BLM Officials and permittees.

5-3 I question the current methods of determining the carrying capacity of our ranges. The manner in which transsecs are located is one such problem. Much of our desert country is rough and has to be approached either horseback or on foot to get back into the areas that should have the testing sites. They should not be located near roads, watering holes, etc. This is another area that the permittee can assist the BLM.

5-4 The management plans are presently based on the assumption that all years are drought years. Many permittees have been cut on their allotment this year, one of the best rainfall years this country has seen in a long time.

5-4 There should be some consideration given to use of additional feed when it is available, providing the permittee is a sound manager.

It is a fact that some areas in the San Simon - Gila Valley have laid vacant for many years and they still will not qualify as excellent. The word excellent is another concern of mine. If interpretated literally these lands will never achieve.

5-5 Another key question is the cost of administration of these additional improvements, etc? I would like to receive an estimate of these figures if they are available.

5-6 How much of this land is self-supporting and how much is supported by tax dollars? Do recreation users pay for the privilege to use public lands the same as ranchers pay for grazing it? Presently the answer is no.

5-7 I cannot condone your wildlife preference position. When there are 12,000 hunting licenses sold in this area, how will the deer and other game ever be up to standard? The small game is excellent, this contradicts the statement in the draft that over grazing has caused the game numbers to be decreased.

5-8 How much input has the private land owner and the Arizona State Land Department had in the preparation of this draft and the proposed management programs? These private, state and public lands are contiguous and so they should be consulted.

5-9 Also, there was a problem with the Safford Office in the amount of time that it took to get a copy of the draft statement. Most of the people that requested a copy had to wait for it to be sent from the Phoenix Office. This only allowed a few days for individuals to read and try to digest this massive amount of information.

5-10 I am greatly concerned with how literally this draft will be interpreted by BLM Staff. It could force many permittees off public land, and if this happens, everyone will lose. The land will suffer as will the wildlife.

We the public are supporting your organization and we must reverse the direction you are traveling. We wish to work with you for the betterment of our lands, but we refuse to be dictated to by you.

I would like to add that at this time we have no BLM lease. I am writing this letter as a very concerned citizen who happens to be a member of the cattle industry.

Sincerely,

TEN RANCH PARTNERSHIP
Terry McEuen
Terry McEuen, Partner

Response:

5-1 County statistics for Cochise, Graham, and Greenlee Counties were applied to the ES area where a further breakdown of the area was not possible. For specific references see the reference section, pages R-1 to R-16.

See responses to hearing comments #5 and #6.

5-2 The additional improvements are included in each AMP's benefit/cost ratio. Although some of these B/C ratios are less than 1 to 1, they will be re-evaluated and the AMPs may be modified to meet resource goals with reduced improvement costs.

BLM will work cooperatively with the permittee to develop sound AMPs. Some areas of contention, however, cannot be negotiated, since BLM is mandated by law and Federal regulations to authorize only those livestock numbers that are proper for the resource.

5-3 See appendix A for the methodology for determining carrying capacity. The ocular reconnaissance method is an accepted range inventory procedure. The location of transects is discussed in response to hearings comment #2.

5-4 The ES does not assume all years are drought years. No formal reductions in carrying capacity have been made this year. Any cattle taken off BLM allotments in the ES area this past year have been voluntarily removed by licensees.

See response to hearings comment #3.

5-5 The cost of administration of additional improvements as provided in the AMPs has been estimated and included in the benefit/cost analyses. The B/C analyses are available for review in the Safford District office.

5-6 The ES area has a total of 2,804,712 acres. Of this 1,349,681 acres are public and other Federal lands, and 902,071 acres are State lands. Private lands on which taxes are paid total 552,960 acres.

Public law 94-565, known as the "In Lieu of Taxes Act" (31 USC 1601), authorizes payments to local subdivisions of government--generally counties. These compensate for money that might be collected as real estate taxes had the public lands passed to private ownership.

Recreational users are not required to pay for their use of the ES area. They do pay income, gasoline and other taxes, which return to the U.S. Treasury. Also see response to hearings comment #8.

5-7 See response to hearings comment #9 and #10.

5-8 Safford District representatives contacted livestock operators personally during the preparation of AMPs to obtain the operators' recommendations and to familiarize the operators with the contents of the AMPs.

These contacts have been ongoing throughout the entire development process of the ES. See response to hearings comment #15.

5-9 The ES was mailed directly from the printer in Washington, D.C. Some copies were late in arriving. Although the public review period ended on June 19, 1978, we have responded to letters received through July 7, 1978, extending the review period 18 days.

5-10 See response to hearings comment #22.

6

State of New Mexico

GOVERNOR

JERRY APODACA

DIRECTOR AND SECRETARY TO THE COMMISSION

HAROLD F. OLSON

DEPARTMENT OF GAME AND FISH

STATE CAPITOL
SANTA FE
87503

STATE GAME COMMISSION

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DR. FRANKLIN B. ZECCA, GALLUP

June 5, 1978

Mr. Robert O. Buffington
Arizona State Director (911)
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. ~~Buffington~~: Bob

The New Mexico Department of Game and Fish has reviewed the Draft Environmental Statement for the proposed Upper Gila-San Simon Grazing management program and wish to make the following comments:

Impacts upon wildlife and wildlife habitat are adequately addressed and the summary on Page 3-16 anticipates that benefits to wildlife will improve as a result of the proposed management program. We are particularly pleased with the emphasis being placed upon riparian habitat. In the State of New Mexico that portion of the Gila River in the Environmental Statement area provides habitat for a large diversity of wildlife species.

6-1 We suggest the following additions to the Endangered and Threatened Animal Species List: osprey, *Pandion haliaetus carolinensis*; Gila woodpecker, *Melanerpes uropygialis uropygialis*; and Bell's vireo, *Vireo bellii* sspp.

Thank you for the opportunity to review and comment upon the draft statement.

Sincerely,

Harold

Harold F. Olson
Director

Response:

6-1 Appropriate text changes have been made.

7

Bureau of Land Management
Arizona State Director
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Sirs;

After reviewing the proposed allotment plan for my ranch, I would like to offer these comments.

It is understandable that with all the environmental groups pressuring our government agencies some sort of response is expected and warranted. We all deserve an answer and we expect to be heard.

The preservation of our resources as well the utilization of them is of equal importance. However, enough of that I must deal with my situation alone.

I have lived in this area, Klondyke, Oracle, Mammoth, Hayden, Tucson, Globe and San Manuel for 51 of my 54 years. The other 3 years were spent in the navy during 1943 to 1946. During these 51 years I or my family have been connected with mining and ranching. We owned ranches at Klondyke, Copper Creek and now at Mammoth. I have seen range conditions at their worst, 1935 and at their best, 1941 and 1977. The other years have been as you know, from poor to good. It is my opinion that the range generally, in this area, has gradually improved since 1935 when allotments were starting to be fenced and wildlife such as deer and javalina graduall replaced wild burros which numbered in the thousands. It was not until the late 1940 s that the mule deer in this area were plentiful enough to allow for a hunting season. By then the burros were gone. Naturally burros deserve a place on the land but they totally dominated the waters, even to the point of keeping cattle and deer away. They (the burros) ran through barbed wire fences as though they didn"t exist. They also pulled grass up by the roots or snipped it off so low that other animals could not reach it.

Generally in this area, range conditions in my opinion are improving. Some of the cactus, cholla and sahuaro, have declined considerably. The most evident cause in my memory was about 15 years ago during a severe freeze of prolonged duration. The low cactus prickly pear and small sahuro and cholla, survived the freeze but the larger ones, unless they were in protected spots, fell victim to the freeze and wind. On my ranch right now chollas are increasing.

Some people tend to judge range by grass conditons alone. Most grass is seasonal and requires reseeding each year. Many of the tall good looking grasses are not eaten by cattle except in isolated cases. Palo Verde and mesquite are excellent wildlife food and both are on the increase on the Galuiro slopes. The retention of large percentage of old grass, after it seeds, leads to fires and also prevents new seeds from germinating, winter feeds in this area such as filaree, foxtail and some winter grasses are beaten down by summer and spring rains so they do not usually lead to fires. It also appears that slopes and canyon sides have more grasses than most flats and mesas. I attribute this to the fact that mesas and flats are especially vulnerable to wind as well as the fact that water drains from the mesas into the slopes and creeks.

The type of cattle raised on the various ranges plays a big part in range management. In areas of infrequent waters it is necessary to have cattle that can travel ong distances to water. Hereford and Angus cattle have a range of about a mile at most. They tend to stay close to water and become sore footed on rocky hard range. They water daily. As in my case a Brahman Hereford Charolais cross provides stock which can travel 4 miles to water. They travel at night and only water, even at warmest times, every other day. They do not become sore footed nor do they stay in the area of the water. These crossbreed calves weigh approximately 100 lbs. more at 1 year than herfords or angus. They do not have pinkeye and are more resistant to other ailments.

7-1 All this leads up to an evaluation of your management plan for my ranch. You suggest that I be cut to 44 head on 10 sections of BLM land. This means that after bulls, replacement heifers and a 75% calf crop I can be expected to raise 27 saleable calves per year. Economically for me this would be catastrophic. I would hope that we could re-evaluate. It is my opinion that this range could handle 8 to 10 cows per section and still have wild-life in increasing numbers and rangeland in improving condition.

I have to agree that more water development or deployment should be att-empted. Probably a well or two could be drilled in strategic spots and underground plastic pipe could feed other areas. I am in an awkward position in regards to pumping since I have no available electricity . However if there is no other way, a gasoline driven pump could be used if sufficient storage tanks are built. It has been my experience that a gasoline pump requires much maintenance and fails when most needed. However, with large storage tanks a pump can usually be back in service before the water is depleted.

7-2 I would like to see more fenced pastures, probably 5 in all for the 21 sections, for better cattle deployment and control. Also if you would consider the wells and windmills opposed to pumps, I would certainly attempt to pay my fair share. Most wells in this area are drilled for $6.00 per foot and casing is 3 to 4 dollars per foot.

In conclusion it is my opinion that we both desire to achieve the same objectives. It appears that environmentalists however would remove all livestock not considered wildlife. We all need beef but we also need to protect the beef producing facilities. We ranchers want to do our share yet we also want some compensation for our efforts which include main--taining fences, waters and generally watching over the land. Hunters deserve their rights too, and this includes some game to hunt.

Thank you for your kindness and consideration. It has been a pleasant experience to deal with gentlemen like Mr. H. Byrd and E. Alvarez.

Sincerely
H. Hendrickson
H. Hendrickson

Response:

7-1 Vegetation within the BLM allotment discussed is of a desert shrub type. Density of desirable perennial forage species is sparse in much of the area. During seasons of favorable climatic conditions, however, annual production may be abundant. The carrying capacity estimate did not consider annuals since favorable seasons cannot be predicted. Also see response to hearings comment #3.

As requested by the lessee, the carrying capacity will be re-evaluated before implementing a rotation grazing system. With proper stocking and implementation of a grazing system that provides periodic rest from grazing, the carrying capacity is expected to increase.

7-2 The present lessee acquired the allotment after the AMP was developed. Input from the previous lessee, however, was attained in developing the AMP. Objectives of the AMP were identified, and it was decided at that time that adherence to a three-pasture grazing system would meet these objectives with a minimal amount of range improvement. If evaluation after implementation of the grazing system indicates a need for modification, the grazing system and associated improvements may be changed.

Windmills have not been as successful as some other sources of pumping water, because of the lack of wind at different periods of the year. Generally, windmills have to be supplemented by other forms of water production during the summer when livestock are drinking more water.

IN REPLY REFER TO:

SE

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

May 30, 1978

MEMORANDUM

To : State Director, Bureau of Land Management, Arizona State Office, 2400 Valley Bank Center, Phoenix, Arizona 85073

cc Safford DIST

From : Deputy Regional Director, Region 2 (SE)

Subject: Section 7 Biological Opinion - Upper Gila-San Simon Grazing Management Program

This responds to your request of May 11, 1978, for formal Section 7 consultation as it pertains to the subject project in southeast Arizona.

Specifically, Arizona BLM proposes to introduce a revised livestock grazing management program on approximately 1,346,709 acres of public lands in the Upper Gila-San Simon area of the Safford BLM District. The program will involve various levels and techniques of grazing management by identified units and includes additional range improvement actions intended to benefit the land resource base.

BLM has identified five Federally listed endangered species which do or may occur in the project area. We agree with this identification and will address each of these species, plus the woundfin, on an individual basis in relation to Section 7 requirements and our related biological opinion.

Mexican Wolf (C. l. baileyi): This animal has been extirpated from the U.S. as a resident species for a number of years. Individual animals may still occasionally enter the U.S. from Mexico in extreme southwest New Mexico (1971) and southeast Arizona. There is limited evidence to indicate one or possibly two wolves were killed in Arizona in 1975/1976. The origin of these animals remains in question, we do not know if they were brought in and released or came in from Mexico. Based on our current work in Mexico with this species it appears this animal will not survive, with current estimates of the total population being less than100 throughout Mexico.

8-1 We do point out that this wolf today, and perhaps historically, preys heavily on livestock (cattle) and should they occur or enter the area under question they will prey on cattle, most probably those in the long yearling class. The EIS does not address probable courses of action regarding management of predatory species in relation to livestock management. It is our recommendation that should there be evidence of wolves or wolf predation, in which some action will undoubtedly be taken, it should not be of a nature to cause permanent injury or death to the animal. The Fish and Wildlife Service will be willing to work with you on this problem should the need arise. Should the question of predator management in relation to livestock use of these public lands be addressed in your EIS?

It is our biological opinion that your proposed program is not likely to jeopardize the continued existence of this animal nor adversely modify habitat essential to its survival.

Mexican Duck (A. p. diazi): This species is under review by the Fish and Wildlife Service to determine if sufficient data exists to de-list this bird from its present Endangered status. Current data indicates that approximately 90% of the U. S. population is phenotypically hybridized with the mallard (A. p. platyrhynchos) and it is expected that close to 100% of this same population is genotypically hybridized. The population in central Mexico of 20,000+ Mexican ducks appears secure and stable. Regardless of the outcome of the current status review, it is our biological opinion that BLM's proposed actions will not jeopardize the continued existence of this species nor adversely modify habitat essential to its survival.

Bald Eagle (H. leucocephalus): This species occurs as a winter resident and, historically, as a breeding bird in selected areas in or adjacent to the project location. We are not aware of information to verify current nesting of balds in this area. At this writing there are seven known active bald eagle nests in Arizona, all associated with the Salt and Verde River riparian habitat to the northwest but outside of this project area. It is our hope that this nesting population will expand in future years, but in order for this to occur, suitable habitat must be available. We strongly urge and support management practices which will lead to the protection and maintenance of riparian habitats for the bald eagle as well as a variety of other species. Both Sections 2 and 7 of the Endangered Species Act address the requirement for all Federal agencies not only to conserve but to restore listed species and the ecosystems upon which they depend. This is crucial for the restoration of the bald eagle in the Southwest and although the riparian habitat type is of limited scope in the project area, as it is throughout the Southwest, it would appear mandatory that the responsible Federal agencies utilize all their authorities to maintain and restore this essential habitat. Grazing has not assisted in maintaining these areas and has generally been responsible for degradation of the habitat and the wildlife dependent upon these areas.

In relation to the bald eagle, it is our biological opinion that the actions proposed by BLM are not likely to jeopardize the continued existence of this species nor adversely modify habitat essential to their survival provided that areas of riparian habitat are carefully managed to restore and maintain them as potential future bald eagle nesting sites and to protect the aquatic environment upon which this species primarily depends for its food supply.

Peregrine Falcon (F. peregrinus): This species occurs and may nest in appropriate habitat within the project area. There is evidence to indicate existence of at least one active eyrie adjacent to the Gila River near its confluence with the San Francisco River (Woody and Porter, 1975) and there are additional potentially active sites. As with the bald eagle, protection of the riparian habitat is of utmost importance to the peregrine in supplying an abundant and diverse prey base whose level of pesticide contamination is hopefully low. This might be the case for prey species in this area, except for the more highly migratory species. There is limited information which tends to indicate that peregrines nesting and produced in southern New Mexico may not be as migratory as once thought. This would tend to favor a reduction in pesticide contamination probability and a similar situation could logically be expected in the project area under question.

With protection and restoration of the riparian habitat in the project area by BLM it is our biological opinion that the proposed actions of BLM are not likely to jeopardize the continued existence of the peregrine nor adversely modify habitats essential to the species' survival and restoration.

Gila Topminnow (Poeciliopsis occidentalis): As the common name implies, this species is endemic to the Gila River and its lower tributaries. Once widespread throughout the marshes bordering the major rivers (Gila, San Francisco, Santa Cruz, San Pedro, San Simon) and smaller tributaries, it is now known only from scattered springs and streams in the drainage. Known natural localities include Bylas Springs, San Carlos Indian Reservation; Monkey and Cottonwood springs, Santa Cruz Co.; Cienega Creek, Pima Co.; Sonita Creek, Santa Cruz Co.; Santa Cruz River, Santa Cruz Co.; Cocio Wash, Pima Co. Introduced locations include the irrigation pond at Boyce Thompson Arboretum, Pinal Co.; Aravipa Creek, Graham Co.; Hidden Waters, Maricopa Co; and several localities in and around Phoenix.

8-2 The Aravipa Creek reintroduction has been repeated several times, the last in 1977. No status of that reintroduction is available at this time but it seems likely the species is found there. The ability of Gila topminnows to survive in small headspring refugia is typified by the Bylas Springs populations, one that appears to be maintaining itself in a 0.5 mm spring flowing less than 0.1 cfs. It is quite probable that other springs exist along the Gila and San Pedro rivers that continue to harbor this endangered species or could if reintroduced. Riparian site protection and reintroduction into suitable springs should be considered by BLM as an endangered species restoration effort.

It is our biological opinion that the actions proposed by BLM will not jeopardize the continued existence of this fish nor adversely modify habitat essential to its survival.

Woundfin (Plagopterus argentissimus): This endangered species was once found along the Salt and Gila rivers, probably within a portion of the proposed grazing area. Now limited to the Virgin River in northeastern Arizona and Utah, the Woundfin Recovery Team has recommended its reintroduction into the Gila River between Safford and the state line.

Although the proposed actions of BLM will not jeopardize the continued existence of this species nor adversely modify essential habitat we are hopeful that BLM will support restoration efforts and take appropriate actions to preserve and maintain potential reintroduction sites.

Candidate Plant Species: Although there are presently no listed threatened or endangered plants in the project area, there does occur a number of species proposed for listing, which are recognized in your draft EIS. Species formally proposed for listing have no legal status under the Endangered Species Act, however, every Federal agency should recognize that these proposed species may become officially listed at any given time and have an impact on the actions of Federal agencies. In this case it would behoove
8-3 the BLM to not only identify the proposed species and their distribution within the project area but also to formulate plans to protect and manage these plants as required by law should they be listed. We suggest you give this serious consideration in your planning efforts.

These comments do not constitute Fish and Wildlife Service review of the Draft EIS pursuant to NEPA requirements. Only the Section 7 consultation process has been addressed.

Jerry L. Stegman

Response:

8-1 Should Mexican wolf predation on livestock become a problem, the Fish and Wildlife Service will be consulted before any action is taken that might affect this species.

The impacts of the proposed action on predatory species of wildlife are discussed in chapter 3. The subject of predator control has not been addressed directly in the ES. The need for control measures is not expected to change significantly. Those species that do occasionally prey on livestock are expected to increase slightly, and natural prey species populations are likewise expected to increase, thereby making more natural food available.

8-2 Table 3-5 has been changed to show that the Gila Topminnow is present in Aravaipa Creek.

We agree that other perennial portions of the Gila and San Pedro Rivers and spring system may contain existing Gila Topminnow populations or potential habitat for reintroduction of the species. Through present studies such as the Gila River complex biological inventory or in-house baseline wildlife inventories, we will identify present and potential Gila Topminnow areas.

8-3 On page 3-14 the ES states that of the 10 proposed threatened and endangered plant species known to occur in the ES area, none are expected to be affected by livestock grazing.

When candidate endangered and threatened plants are formally listed, and if the proposed action may affect the listed species, BLM will initiate consultation under Sec. 7 of the Endangered Species Act.

9

BRUCE E BABBITT
GOVERNOR

Arizona
State Land Department
1624 WEST ADAMS
PHOENIX, ARIZONA 85007
602 - 271-4634

OFFICE OF
STATE LAND COMMISSIONER

June 9, 1978

Mr. Robert O. Buffington
State Director
U. S. Department of the Interior
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

The staff of the Arizona State Land Department (ASLD) has reviewed and analyzed the Bureau of Land Management's (BLM) draft Grazing Environmental Statement for the Upper Gila-San Simon Area. Within the ES area there are 696,631 acres of State Trust Land. These lands are intermingled with the private and public lands considered in the ES area. This department is primarily concerned with the impacts that the proposed action would have on the trust land; however, comments are offered also on the adequacy of the statement as it relates to public land and the management action chosen. The following comments are offered for your consideration in preparing the final statement.

It should be noted that the Land Department's concern is to assist in a reliable determination of forage quantity and quality and for sustained yield programs consistent with defensible soil and water conservation practices. Allocation of forage is a matter to be considered in terms of the State's trust laws.

The objective that is being looked to by the ASLD is a mutual working program that fulfills the purposes of the respective land ownerships within sound management practices.

pp. 2-18 -- 2-120

9-1 The Future Environment section in the statement assumes a downward trend in most vegetative types under present management. Range condition trend information is extremely weak or nonexistent throughout the statement.

p. 2-132

9-2 The stated comparisons of 1964-76 survey to a 1936 survey concluding a 1.2% downward trend per year appear to be the major basis for assuming a downward trend. On p. A-4 under Methodology the statement is made, "Comparisons of previous ratings of grazing units revealed that, in many cases, one method would rate the grazing unit in good condition, another would rate the grazing unit in poor condition and a third method would rate the same unit differently from either of the other methods."

Mr. Robert O. Buffington
State Director, Bureau of Land Management
June 9, 1978
Page two

Grazing capacity data used to determine the livestock reductions was determined by actual site specific ocular reconnaissance and estimates on 31% of the ES area (716,193 acres). Of this acreage, the data on 510,772 acres was collected prior to 1968.

Calculations indicate that 69% of the ES area (1,618,782 acres) was not surveyed, and of the 31% that was surveyed 510,772 acres (71%) the data was ten years old
9-2 or older. In essence, 2,129,554 acres or approximately 90% of the ES area has not been reviewed in ten years.

Because the assumption of downward trend has been used as a basis for management change, and is further used in the assumption that 115% increases "across the board" (p. 3-70) are possible, and even further used as a factor in the section on economic impacts, there is strong likelihood that the stated impacts that depend on that data are weak in their reliability.

The discussion of economic impacts on pp. 3-69 through 3-71 was difficult to follow. On p. 3-69, ES area earnings are estimated to lose 57,209 AUM/year with a value of $470,000/year, assuming continuation of present level of production. This computes to a value of $8.22/AUM or $98.6/CYL under the proposed management. An estimated increase in fifteen years of 16,365 AUM has been proposed using the computed value of $8.22/AUM. The increase would be $134,520 against the $470,000 indicated annual loss, or a net annual loss after fifteen years to continue at $335,480/year. This net loss is not included in the discussion, although the 16,365 AUM figure is qualified by indicating increased benefits through calf weight increase, etc., using the AIARC reference. As we understand the report, the figures were presented only to reflect the potential if a ranch is poorly managed against a ranch that is well managed. Using the 115% factor, across the board does not appear realistic.

9-3

BLM also concluded that the initial loss of 57,209 AUM would reduce "Taylor Grazing Act payments" (phrase should be changed) by $10,000 (not qualified as to time but presumed to be annually), but the 16,365 AUM increase would "ameliorate" the loss over the 15-year period. A continued net loss of $7,217 per year is not shown ($10,000 ÷ 57,209 AUM = $.17/AUM; $.17 x 16,365 = $2,782). Further loss figures for a 50-year period are shown to average $8,400 plus $11,000 initial loss and a $9,000 annual loss for tax value at the 1975 rate.

Ranch values are estimated to decrease $6,674,000, which computes to $1,399/CYL, then increases back with the 16,365 AUM increase to $5,420,000 loss. Computed, it is $4,765,022. The methodology for computing the BLM figure is not given and there appears no way to cross check or to extend the figures with any accuracy. Using BLM figures as a base, however, the following calculations could be made for the 15-year planning period:

Mr. Robert O. Buffington
State Director, Bureau of Land Management
June 9, 1978
Page three

Computed value of AUM = $8.215

Initial cuts = 57,209 AUM

Projected increase = 16,365 total spread over 14 years
= 1,169 annual increase

Using the formula T = (-57,209 x $8.215)15 - 1169 x $8.215)14
T = $6,915,131 net loss in ranch value.

9-3

This $6,915,131 net loss plus all the other losses in tax revenue, etc., can not be offset by increases in production as shown by BLM as a +$432,000 economic impact (p. 8-3). The economic impact appears to be significantly negative, although it has been presented as a positive factor. Using BLM AMP recommendations, reductions on trust land of 1,441 CYL have been estimated. The loss to state trust land alone is calculated to be $142,053 annually for forage value with an additional loss for ranch value of $2,017,255. These figures do not include the associated losses of taxes and multipliers.

Under Land Use Plans (p. 2-100), the remarks relative to water rights and use contain a complete misstatement of Arizona Water Law governing appropriable water, and a milder but equally grave, incorrect interpretation of Arizona groundwater law.

9-4 From these misconceptions, the draft seemingly comes to the conclusion that range improvements such as stock tanks, detention dams, detention structures, spring modifications, wells, etc., require no formalities of applications made, approvals granted or permits issued by the State of Arizona to be required or even contemplated. At the same time, the drafters are seemingly unaware of the Globe Equity Decree which effectively governs much of the use of the Upper Gila River system and which is a federal decree.

The three detention dams on the San Simon are probably needed. Because the dams are included in all discussions of range improvement, it is presumed that all or part of their cost will be allocated from range betterment funds. The construction of the dams has been given an extremely high, if not the highest, priority for
9-5 implementation. This would take a major portion of the available funds, apply them to a limited area affecting a low number of ranchers, and has a low potential for improving the general range condition of the total ES area. This would appear to be a rather poor decision. We understand that these projects have been proposed for many years and have yet to be funded. By including them in the ES it appears that an attempt is being made to reinitiate the projects or circumvent the system, since the primary benefit appears to be flood and erosion control.

The discussion of soil loss (pp. 3-2 -- 3-3), which is interpreted to indicate
9-6 that improper range management is causing 178 acre feet/year of sediment, is shown to be a most adverse impact (p. 8-3) in the alternatives. Involved in the proposed

action are 2,346,062 acres, giving a reduction in soil loss of .0000758 acre feet/
9-6 year per acre through proper management. This computes to .366 cu. yds./acre per
year, which is not a significant number relative to erosion classifications.

In the discussions on vegetation, omissions appear evident. On p. 2-23 Palo Verde
was omitted from the desert shrub type list of major plant species. On p. 2-18
9-7 plains bristlegrass (Setaria microphylla) and bush muhly (Muhlenbergia porteri)
would appear to be in order on the list of grassland types, as would plains
lovegrass (Eragrostis intermedia) to a list of mountain grassland types.

On p. 2-118, the assumption that unless livestock numbers are reduced as a whole in the ES area, the vegetation will deteriorate, does not appear to be valid.

9-8 On p. 2-120, the authors state that fourwing saltbush, tobosa grass, black grama
and bush muhly would virtually disappear in fifteen years from the creosote bush
type. This appears to be an unreasonable assumption since these plants presently
occur after many more than fifteen years of heavy use.

In general, the section on grazing systems appears to be fairly complete and comprehensive. A few general comments may be in order.

In all intensive management systems flexibility based on phenology, rather than calendar dates, is needed.

The Santa Rita system has been shown to be beneficial to Santa Rita threeawn and
similar species. These plants do most of their growing in the spring. An adjust-
9-9 ment of dates for resting and grazing would be needed if warm season grasses are
the key species. The Santa Rita has not been widely used for long periods. Extra
monitoring of the units using this system appears desirable.

Ephemeral and Custodial management have been included in the discussion of Intensive Management Systems. They are not generally considered intensive management systems.

9-10

The assumption that custodial management by the agency will have negative impact on all grazing units may be incorrect. The unit may be in intensive management programs by the user and may be properly used. The fact that an allotment contains a low percentage of federal acreage does not indicate a lack of management.

It appears that a great deal of emphasis has been placed on the variability of
production on ephemeral ranges. It should be remembered that in desert ranges
9-11 all production is dependent on significant rainfall; therefore, the perennial
ranges are also variable. Forage production over a period of time on ephemeral
ranges may be as predictable as production on perennial ranges.

The alternatives to the proposed action in Chapter 8 appear to have been chosen so that the only conclusion that the reviewer can make is that the proposed action is the best management system. It is our understanding that with the adoption of the ES, the proposed action is also adopted and will be implemented. In view of this, the ASLD suggests and recommends that an additional alternative be evaluated. The alternative that is suggested would minimize the economic impact, would achieve the goal within the same time frame if not sooner, and in general would be more acceptable action than the proposed action.

The suggested alternative would utilize all of the essential elements of the proposed action, but would change the order of implementation suggested on p. 1-41, viz:

1. Implementation of the proposed management systems, including the construction of range improvements;

2. Followup - range use supervision, range studies, multi-resource monitoring, inventory, and evaluation, as discussed in the intensive grazing management section;

3. Adjustment of licensed livestock use to balance with the grazing capacity. This should be done only after detailed studies on the effectiveness of the management system on individual ranch units and only in cases where there is a wide discrepancy between actual use and calculated grazing capacitites. It
9-12 must be pointed out that range surveys are only rough estimates to establish a starting point. Discrepancies of one to two head per section can easily be compensated through a grazing system and livestock distribution change. Trend is the critical factor in management -- not range condition on a given date. Additional emphasis should be given the drought which occurred during the more recent range survey.

Advantages of the suggested alternative:

1. Minimize the adverse short-and-long-term economic impacts of the action. (BLM concluded that there is a positive economic impact to the rancher. As shown earlier, this conclusion is subject to serious question.)

2. Gain rancher cooperation with the result of accelerating the implementation as opposed to alienating the rancher under the proposed action. This changes the strategy from strict regulatory to an incentive education program.

3. Drastic changes would be made only when adequate data supports the action -- not on a broad-brush approach using interpolated data.

4. Overall objective can be reached within the estimated 15-year time frame.

Disadvantage of suggestion:

Delays in reaching estimated carrying capacities would occur, prolonging current trends.

Mr. Robert O. Buffington
State Director, Bureau of Land Management
June 9, 1978
Page six

Miscellaneous comments:

9-13 The ES does not address the economic impact on the management agency from the proposed action; i.e. costs involved in supervision of the plans versus the economic benefits to be derived.

9-14 The use of public monies for projects with less than a one-to-one BC ratio is questionable.

9-15 The impacts on private land have not been evaluated or have not been discussed in the ES.

9-16 References to BLM manuals that are not easily accessible to the public have questionable value in a report of this kind; perhaps, attaching them as addenda would be of value.

9-17 When data is used that may have a large degree of error, more meaningful information can be exhibited by using ranges of numbers rather than single numbers.

9-18 The methodology section should be expanded to include all calculations for the economic statement.

9-19 Proposed deferments on riparian areas may be an action inconsistent with the multiple-use concept.

9-20 p. 1-27(9) indicates action will be delayed until wilderness values are evaluated. This may cause some problems in implementation of management system.

The foregoing represents professional staff evaluation and does not purport to state policy or to suggest uses.

Thank you for the opportunity to comment and for the assistance your Safford office staff has given during our review and analyses of the AMPs.

Sincerely,

Andrew L. Bettwy
State Land Commissioner

By: Kelly R. Johnson

Kelly R. Johnson, Administrator
Office of Natural Resource Conservation

ALB/KRJ/nhk

Response:

9-1 It is true that precise data on range trend or condition are weak in the statement. We believe, however, that the reinventorying of permanent line transects (figures 2-2 through 2-8) does accurately portray the range trend in the ES area.

BLM personnel familiar with the vegetation and the area estimated the range condition according to SCS criteria. Although detailed data were not presented, we feel the information shown is reasonably accurate.

9-2 As mentioned above, comparisons of surveys were not the only criteria used in estimating range trend.

That 72 percent of the ES area was either not formally range surveyed, or not recently surveyed, does not mean 90 percent of the ES area has not been reviewed in 10 years. BLM personnel visited each grazing unit to make estimates of carrying capacity during AMP development before ES preparation.

An assumption is not made that 115 percent increases "across the board" are possible. The 115 percent increase figure was used from a study in the Chino Winds Soil Conservation District (Arizona Inter-Agency Range Committee 1972, 1973), Yavapai County, Arizona. This study mentioned a 115 percent increase in net returns per AUM but not a 115 percent increase in livestock numbers.

This study, in effect, said that, by cutting the herd size and the grazing pressure on a closely grazed pasture, forage production would increase, which could be translated into beef production. This increased production would be reflected in increased weaning weights, cull cow weights, and calf-crop percentages and decreased death losses. The reduction in herd size would also lower capital and operating costs. In this study, a 30 percent reduction of herd size resulted in an increase in net income per AUM of over twice that of the original herd.

9-3 The 57,209 AUM loss would result directly from reducing livestock use to carrying capacity. This reduction is estimated to result in diminished personal income to the rancher and the community. The $470,000 represents the initial loss in primary (rancher) and secondary (community) income resulting from the reduction in AUMs. The economic analysis on which these figures are based assumes that the present efficiencies of production would not change.

The estimated increase in productivity is expected to begin after the reduction and to develop gradually over a 15-year period in equal increments each year. This increase is based on herd reductions, range improvements, and management alternatives. Assuming that increases would occur uniformly over this period is not completely realistic but it eliminates the obvious problem of forecasting AUMs by year until full potential is reached. We feel that the actual increase would not deviate significantly from this assumption.

In evaluating income flows over time, one must consider initial losses, the build-up period, and the uniform flow of income occurring after the full potential of range improvement is achieved. The period of analysis used is 50 years. An arithmetic average was not used to derive income flows, since an arithmetic weighting of the benefit value does not recognize the time value of money that must be accounted for in all economic comparisons. The economic average weighs each year's value according to its discounted present worth value. The flow of income was analyzed over a 50-year period and adjusted for the present worth. An interest rate of 6-3/8 percent was used for discounting procedures.

To account for increased calf crops percentages, weaning weights, and cull cow weights; reduced death losses; and decreased costs (capital and variable) in the analysis, we used the Chino Winds analysis (Arizona Inter-Agency Range Committee 1972, 1973) to index up the net income per AUM. This increase would apply to the animals grazing on both the increased AUMs and the base AUMs (after the reduction). We adjusted the increased income to account for the multiplier effect on the economy. We then analyzed this value over the 50-year period and discounted for the time of occurrence. This analysis resulted in an average annual income of $407,000.

Although the Chino Winds study may not accurately depict the change in returns per AUM in the ES area, it does demonstrate that decreases in grazing pressures will result in increases in income through increased efficiency. The proposed action would not only decrease grazing pressure by herd reductions, but it would better utilize existing range through the use of range improvements. These types of benefits should be accounted for to properly evaluate the impacts.

The average annual loss of payments made under the Taylor Grazing Act ($8,600) and tax revenues ($9,300) are economic averages. These figures, discounted for time, represent an average of the initial, the 15-year improvement period, and the uniform flow or the stabilized period for the remainder of the 50 years. The same procedure was used to analyze these cash flows as was explained in the previous comment.

Here again the average annual loss in ranch value represents an economic average over the period of analysis.

The comment on loss of ranch value appears to imply that this loss is an out-of-the-pocket cost that occurs in the period of analysis. This is not true. As pointed out in the text, loss of ranch value could reduce the rancher's borrowing capacity and the sale value of the ranch if and when the rancher chooses to sell his property and the associated privileges. A ranch has a cash value based on the number of head of cattle that it can run. A ranch's value in this case would be based on leased and private land. When a rancher sells his spread, he sells his fee (private) land together with his leased land at a price that roughly approaches all fee land. Technically the Federal Government does not recognize that its leases have a capital value, although the market place recognizes this value.

In adjusting livestock numbers, BLM resource specialists analyzed the impacts of grazing on Federal, State, and private land. (See table 3-15.)

9-4 The discussion of water rights in the ES (p. 2-100) has been deleted, since livestock grazing does not have a significant impact on water rights. BLM recognizes that the State of Arizona does have laws regarding application or issuance of permits for the beneficial use of water. The State and Federal Governments, however, have unresolved differences regarding this matter, which are beyond the scope of this ES.

9-5 The presumption that range betterment funds will be used to construct detention dams on the San Simon is incorrect. The detention dams will be funded by appropriated monies. The inclusion of these detention dams in the ES is an attempt "to implement a livestock grazing management program based on <u>multiple-use concepts</u> . . ." (ES p. 1-1).

9-6 It is true that this is a small amount of sediment over the entire ES area. The rankings on table 8-1 are an attempt to show that, although the no-action alternative would be the most adverse, the total impact would be minor.

9-7 As mentioned on p. 2-23, the major plant species in the desert shrub type were listed as a whole. Although blue palo verde (Cercidium floridum) and little-leaf palo verde (Cercidium microphyllum) are common on the western portion of the ES area, as a whole and over the entire ES area they are relatively unimportant.

An intensive review of Kearney and Peebles' The Flora of Arizona, Frank W. Gould's Grasses of the Southwestern United States, and A. S. Hitchcock's Manual of the Grasses of the United States revealed no grass "plains bristlegrass (Setaria microphylla)". We assume that the commenters meant Setaria machrostachya. This grass is common in many of the vegetation types as is bush muhly and plains lovegrass. Under climax conditions on some range sites they may produce up to 10 percent, individually, of the current year's growth of vegetation on that site. They have not been found in this abundance on range sites in the ES area.

We acknowledge that in chapter 2 we did not describe all species found in a vegetation type. The purpose of the plant lists is to include only major, important or abundant species to give the reader an idea of the vegetation community.

9-8 On the basis of data presented in the ES, one can validly conclude that unless livestock numbers are adjusted to the carrying capacity, the vegetation resource will continue to deteriorate.

The text is changed on the creosotebush type from "virtually disappear" to "decline in percent composition."

9-9 Santa Rita threeawn (Aristida glabrata) is not listed as a cool-season grass but reportedly flowers in the spring, summer, or fall whenever conditions are favorable.

The Santa Rita system has improved range conditions on the Santa Rita Experimental Range. At least 90 percent of the species occurring on this range also occur in the ES area. This system provides rest at times critical to both warm-season and cool-season species. This system will be monitored in the same manner and degree as the other intensive management systems.

9-10 Ephemeral and custodial management are not considered intensive management systems in the ES. We believe that custodial grazing units would not deteriorate vegetation resources. One of the criteria for selecting custodial management is "good to excellent range condition and stable or improving trend." Since total livestock numbers on custodial grazing units would not be regulated, conceivably some custodial units might be overstocked, adversely affecting the resource. Overstocking, however, is not anticipated in view of the monitoring and studies that will be conducted.

9-11 Forage production by annuals on ephemeral ranges for a 50- or 100-year cycle may be predictable on the average. If these ranges are stocked at this "average" level, overutilization of the vegetation resource will occur quite often. Research conducted at the Santa Rita Experimental Range measured 655 pounds per acre production of annual grass one year, 3 pounds per acre the next year, and 900 pounds per acre the third year. This averages out to 519 pounds per acre per year. Out of the 3 years mentioned above, one year's production of annual grasses would be 516 pounds less than average. Stocking at the 519 pound per acre level every year would cause drastic overuse the year that only 3 pounds per acre are produced.

9-12 The alternatives were chosen to present to the public and the decisionmaker a full range of options. See response to hearings comment #22.

The BLM in the past has attempted to implement grazing management systems on apparently overstocked ranges. These attempts have, for the most part, resulted in failures due to excess livestock numbers. Research has proven that no system can substitute for the proper carrying capacity. Your alternative proposal was therefore not considered viable, even though it does have some merit.

Range surveys are only estimates of the carrying capacity. BLM proposes to start initially with the range survey numbers and either increase or decrease cattle numbers according to the results of utilization and other range studies.

BLM cannot, by regulation, allow livestock numbers greater than the carrying capacity.

9-13 The proposed AMPs would require an initial Federal investment of about $784,000. When these AMPs are implemented, they are expected to increase supervisory costs by about $26,000 annually.

BLM is charged with the management of the land under the Federal Land Policy and Management Act of 1976 (FLPMA). Section 102 (a)(8) of FLPMA states that "the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmosphere, water resource, and archaeological values; that where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use;..." Benefits are realized by the public in improved resources and do not accrue to BLM.

9-14 Benefit/cost is but one criterion for evaluating a proposal. Environmental and social concerns are also of prime importance in making a decision, even though their benefits can not be quantified in dollar amounts in many cases.

9-15 The economic and social impacts on private land owners have been discussed in the Economic and Social Conditions portions of chapter 3.

The environmental impacts on private land were included in the ES. Private land included in a grazing unit was not evaluated separately since the private land is not used differently or at different times than the public land and is often not separated by fence.

9-16 BLM manuals are bulky and not easily reproduced. If readers are interested in the manuals, they are available at the State and District BLM offices. To add these manuals as addenda would have been confusing and would have added unnecessary length to the statement.

9-17 Although some numbers may not be correct, the estimates provided were made with the best information available. We felt that using a range of numbers would confuse the reader.

9-18 The evaluation of economic impacts was based on areawide statistics and averages rather than on the accumulated total of the individuals. Development of individual evaluations would require a considerable amount of unavailable personal information about income, investment, and production costs.

Personal income generation per AUM was developed from County statistics (Cochise, Graham, and Greenlee) and applied to the changes in AUMs of production. We recognize that these averages will not apply to all ranches due to economics of size, management differences, and unique individual situations. Some ranches might exceed this level, whereas others would receive significantly less. Market fluctuations would also influence the level of income derived per AUM from year to year.

The Chino Winds study (Arizona Inter-Agency Range Committee 1972, 1973) was introduced and used to index net returns per AUM, even though it does not accurately reflect ranch size or the specific area. The main purpose in using this study as an index was to approximate the benefits to be gained from reducing grazing pressures through increased ranch efficiencies and reduced variable costs. These increases were considered in the appropriate alternatives to better reflect the differences among the alternatives. An income multiplier was applied to the direct income to obtain an estimate of total income flows in the area (direct and indirect). Indirect income is a measure of the personal income generated as a result of the direct income being spent and respent in the area.

Average values per AUM for tax assessment and payments made to the counties under the Taylor Grazing Act were developed for the three county area (Cochise, Graham, and Greenlee) and applied to the ES area. Changes in ranch values were computed on the basis of a cow unit value. The value ($1,400) used was taken from a study of southwest cattle ranches by the U.S. Department of Agriculture, Economic Research Service (1974).

Income flows and costs were analyzed over a 50-year period to account for time differentials of money flow. The interest rate used for this discounting procedure was 6-3/8 percent. The accumulated total for the 50-year period is brought back to an average annual equivalent. This is an economic average that weighs each year's value according to its discounted present worth value.

In the interest of brevity, all the calculations for the economic statement were omitted. They are available for review by interested parties.

9-19 The proposed deferments were made to protect riparian areas and their associated resource values. Many resources were considered, including watershed, wildlife, soils, range, and recreation, and resource specialists from numerous disciplines contributed to making the decision to defer these areas.

Also see response to hearings comment #11.

9-20 The evaluation of areas having potential wilderness values can delay or stop the initiation of some range improvements. If such action occurs, alternative methods of grazing management or the alteration of improvements will result.

Section 603(c) of FLPMA requires that during the period of review of wilderness areas, areas being studied must be managed in a manner not to impair their suitability for preservation as wilderness.

Box 271
Tombstone
Az.

10

ROBERT O. BUFFINGTON (911)
Arizona State Director
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

In the late 1930's an expert team with a lifetime of knowledge and practical experience began the task of computing total livestock carrying capacity. This included the large number of mule deer herds, which had an intake of approximately 90% browse.

10-1 The open land that was enstated under Taylor Grazing Act, then later reborn into BLM, was partly inaccessible, unwatered, naturally arid or already depleted. This land was judged out as close as possible in conjunction with State and Private lands. The data on this was very accurate and stood the acid test for many years and with a practical rodent control program in effect to keep it that way. Why is this practical and proven program being ignored and pushed aside for plain sermonizing and radical changes? (1) It is true the environmental groups would rather see thousands of acres of food producing land depleted than have one sparrow accidently poisoned, but this is not the way to run a country. We are concerned with raising beef for a nation, not an outdoor art gallery or rest home for rats and varmints.

As of now there are less mule deer in the same areas and with the increase in predators and hunters, there will be an even greater decrease in the future. The Game and Fish Department, receiving $50,000 for 10,000 permits for 1,000 mule deer bucks, is going to have its consequences. If anyone thinks livestock should be cut down, this would be a serious misjudgment. How cana BLM staff be allowed to propose changes? (2)

If there is a grass depletion from what it was originally, it has to be the lack of normal rain or lack of rodent control. We know that if there are two Banner tail dens or two Mirum holes to the acre, they are capable of stowing and eating 100% of the seed supply yearly. The perennial sod grasses have a life span of 8 - 10 years. When original grass is gone and no seedlings in its place, you have bare ground practically overnight. Then comes the top soil erosion. This was all proved out by the Biological Survey Department in the late 1940's. Large areas were saved in the 1920's from rodent depletion, then in the 1930's (depression years) the main conservation work by SCS, WPA, AAA, was check dams to hold back seed, erosion, silt and water, then diverted to bring back the grass. Since then the last rodent control was 1947-1949. Later the environmental groups were able to ban the rodent control. At the same time part of the water division was able to ban the conservation work. In short, these groups are the cause of, and responsible for, this depletion.

We all know one group pressures another for their take in one form or another, including public opinion and politics, but the BLM staff has a serious responsibility on its shoulders. How can they consider the environmental groups' damages and corruption of the land, knowing the adverse effects and economic loss to the livestock industry?

Charles M. Kendall

Response:

10-1 The 1937 adjudication of livestock numbers set the allowable use of the range higher than the original SCS range survey indicated was proper (pp. 3-63 and 3-64). The proposed adjustments in carrying capacity of the public lands should have been made in the 1930s.

SOUTHERN ARIZONA ENVIRONMENTAL COUNCIL
Tucson. Arizona

1 June, 1978 JUN 15 '78

Bureau of Land Management
Arizona State Director (911)
2400 Valley Bank Center
Phoenix, Arizona 85073

Re: Proposed Upper Gila-San Simon Grazing management program.

Gentlemen,

The purpose of the Upper Gila-San Simon grazing draft environmental statement is to evaluate the existing condition of grazing areas, it's effect on wildlife and recreational activities and to recommend improvement. To this end we have reviewed this draft in detail and find the draft to excellently portray the existing conditions of the areas covered together with the proposed improvement and management program outlined therein.

The draft is a useful document that can be profitably employed by both Federal planning and management officials as well as by lessees of Federal Range lands. However we also find the draft to be entirely too detailed and repetitive particularly on subjects of only academic interest and a very abortive treatise on the causes, remedies and proposed control of habitual overstocking of grazing allotments by stockmen. Far too much apologetic language, either expressed or implied relative to the cost versus returns on improvements appears throughout the document. Costs whatever they may be are inconsequential when expended in improving public lands. Taxpayers will approve such costs without question. The improvement program as outlined should be contrasted with the expensive Bureau of Reclamation and U. S. Corps of Engineers projects that waste millions of taxpayers money on often useless and in great many instances projects very detrimental to the environment in general.

11-1 In order to bring our comments into proper perspective, it behooves us to mention that livestock production as an industry is exceptionally ill suited to be practiced in historically arid climates, and in particular in areas having soil compositions such as found generally throughout the southwest. In this context we should bring out that livestock raising in Arizona is not an important factor in U. S. meat production. BLM lands in ten western states* produced only 1.8% of U. S. meat production in 1977 hence it is patently clear Arizonas contribution is negligible. However, livestock grazing in other than irrigated pastures in arid regions such as Arizona is a major factor in the destruction of range lands vegetation, loss of wildlife and is a major contributor to soil erosion. With this obser-

*The ten western states are-Arizona, California, Idaho, Montana, Nevada, New Mexico, Colorado, Oregon, Utah and Wyoming.

vation as a premise to be kept in mind we can now realistically evaluate BLM's proposed Grazing Management Program.

While we feel strongly that livestock grazing on Federal Public Lands in Arizona should not be permitted, prohibition of grazing would in all probability result in even a less acceptable alternative, a giant hunting preserve for local and outstate hunters as well as a totally unacceptable Off Road Vehicle over-utilization. Consequently the best solution appears to be that livestock grazing on a moderate scale should be permitted on Federal Public lands, but BLM management must be vastly improved and strict controls must be instituted to prevent overstocking and general range deterioration.

Ranchers have not done their part in preserving the condition of range lands under their leases. The part-time stockmen have been notably permissive in this regard, however the most flagrant violators have been the absentee operators and large cattle companies. We must rationalize between prohibiting grazing altogether on Federal Public lands and instituting effective management and control procedures which must necessarily include updated formulas covering carrying capacities, maintenance and AUM charges. Casual inspection of ranges where grazing allotments were purported not to have been exceeded showed the ranges to be in a very poor condition. We do not agree that BLM is adequately manned in it's field staffs to enable it to satisfactorily perform it's field functions and suggest that budgetary increases be requested to permit appropriate manning of BLM's field assignments.
11-2 It appears quite conclusively that the grazing allotments are not in consonance with the carrying capacities of the ranges, the formula used for establishing stocking limits is either incorrect or too inflexible to compensate for weather fluctuations. We recognize that in order to upgrade over-grazed areas most ranges will have to have the animals removed or their numbers drastically reduced, thus impinging on the ranchers profits even now professed to be minimal. The reason for such low profits resulting from current cattle prices stems not from low retail meat prices but from middle-men's (processing and marketing) markups that are grossly out of line with beef on the hoof and consumer prices in the supermarkets. Maybe stockmen should look to this area instead of insisting on increasing their profits by overstocking ranges. Stockmen have been historically subsidized on Federal grazing lands for decades, further Federal subsidies are unwarranted.

Referring to specific expressions of policy and/or existing or proposed management as set out in the draft Environmental Statement, without intending to be overly critical, our views are constructively expressed on specific issues. For ready reference our comments are indexed to chapter and page numbers of the draft and shown thus, Chapter 1, Page 7 will be referenced as (1-7).

11

One of the most glaring weaknesses of BLM appears to be it's condesending attitude towards lessees of public lands. In fact in some areas BLM seems to have surrendered all of it's authority of management and control over Federal public lands. Moreover it also appears that BLM permits lessees to exercise veto power over some of it's decisions. The New Mexico State Land-Rancher-BLM agreement is an exceedingly poorly
11-3 structured arrangement which for most part vests power over management of range lands (including Federal lands) in the rancher. However we realize that in many instances this is due to pressure exerted by powerful special interest groups and/or our elected public officials. Nevertheless we wish to emphasize that our elected officials are PUBLIC SERVANTS and not owners of Public Lands. (1-6), (1-46), (BLM-Rancher controversy, Mohave County, Kingman, Arizona).

The grazing systems as set out in the draft are well designed and should do much to enhance the quality of range lands from both livestock grazing and wildlife habitat standpoints. The grazing systems and policies outlining management procedures appear to present satisfactory solutions except in the area of enforcement of lessee's compliance with BLM regulations and instructions of local BLM officials. In areas where over-utilization (overgrazing) is evident, use should be immediately reduced well below the former estimated carrying capacity in order to permit the range to recover, though this may require departure from standing procedures. The Custodial
11-4 grazing management is unsatisfactory from the public viewpoint and will require much closer coordination between BLM and the ranchers if severe abuse of the lands is to be prevented (1-6), (1-9), (1-11), (1-23), (2-27), (2-98), (Ibid BLM-Rancher Cont.).

The extensive discussion on range improvements and construction specifications as well as the cost/benefit ratio are self explanatory and need no further discussion here except to note the cost appears to be nominal considering the magnitude of the undertaking and the benefits that will be realized from such improvements. These range improvements are considered to be a MUST for sake of improving the land and preventing further damage and range deterioration. The monetary benefits are relatively unimportant (1-26 thru 1-41).

While soil erosion is normally caused by natural elements (wind and water), the effects of both are greatly aggravated by livestock traffic, ORVs and other overuse of the terrain. Though livestock may appear to walk innocently over the ground, this action breaks the soil crust and subjects the soil to erosion. The extent of erosion by either element depends to what extent the soil was disturbed. In the arid climate of the southwest the soils will not withstand but a very moderate amount
11-5 of animal traffic, hence the soils composition must be considered when evaluating the carrying capacity of the vegetation. Over-grazed areas are very susceptible to soil disturbance and ultimately to erosion by natural elements. Off Road Vehicle operation off of designated roads is disasterous no matter when or where conducted. ORV

tracks over open ground last for years and on the more delicate soils cause ruts which later result in eroded areas. More closed and regulated areas forORVs is manifest (2-6), (2-7), (2-85), (2-127), (2-129), (3-42), (3-59).

Much discussion is entertained on vegetation as affected by climatic conditions and livestock grazing. By acknowledging that Arizona's climate is extremely arid and that much of the area is a virtual desert which is not conducive to lush grasslands or other plant growth palatable to livestock, we must conclude that Arizona is not ideally suited to Livestock Industry! However if animal stocking of range lands substantially below the estimated carrying capacity is strictly observed, and flexibility in consonance with weather and range conditions is maintained in order to allow over-grazed areas to recover, continued livestock grazing on a moderate scale may be justified. On the other hand maybe Arizona should limit it's livestock Industry to Feed Lot Operations. During the last half of the 19th century and the 1st half of the 20th century Arizona's ranges were grossly overstocked without any control whatsoever by stockmen or oversight by State or Federal officials. Consequently a very large part of Arizona's grazing lands were severely over-grazed and virtually denuded of all palatable vegetation which resulted in taking over by undesirable species on most public lands. This legacy of misuse of public lands remains with us today. During this period many areas were so seriously over-grazed that they have not recovered and are beyond hope of natural recovery in the future. Today in many areas we are pursuing the same misuse of Public Lands held under grazing leases or under trespass conditions. Heavy grazing of natural grasses is for most part replaced by growth of undesirable species. Unless livestock numbers are substantially reduced on public lands, the vegetation resource as a whole will deteriorate beyond recovery in the next few years. Today we (BLM) have progressed far in range
11-6 management, but enforcement and compliance with BLM regulations and regional instructions still leaves much to be desired (2-37), (2-118 thru 2-122),(2-126), (2-127), (3-5 thru 3-8), (3-11), (3-63).

Primative values and Natural Resources will be adversely affected by visitors, livestock, weather and vandalism. The only alternative is to mitigate such adverse effects by education, animal control and in appropriate instances criminal prosecution of vandals. The draft Environmental Statement dwells at some length on
11-7 expected vandalism to range improvements. Vandalism is hardly a proper topic for discussion on range improvements, a mere reference to such practice should suffice. Expanded education of visitors and a more determined criminal prosecution of vandals appears to be in order (3-55), (3-56), (3-57).

While recreation activity has many undesirable attributes it is one of civilization's necessary burdens that we must bear, adjust to and learn to live with from now on.

Recreation activities on public lands should present no insurmountable problems if sufficient effort is directed towards education and if proper facilities are provided in picnic and other areas. Education in this regard should be instituted in our public schools, in the home and not left entirely for our public land officals to cope with (2-88), (2-89), (2-90), (2-96), (3-63).

Though it may appear that closely supervised grazing impinges on ranchers freedom of operation for a short term, but in fact firm management and close control by BLM inures to the ranchers long term advantage. It must be recognized that a rancher holding Federal grazing leases enjoys many benefits subsidized by taxpayers. Historically federal grazing leases once entered into have been tantamount to leases in "Perpetuity", which for most practical purposes may be equated to a title in "Fee". A ranch of any size and structure (fee and grazing leases) has a cash value based largely on the leases held by the rancher. A ranch of any description is worth many times what the rancher actually owns in fee and pays taxes on if he holds substantial grazing leases without which the ranch has little or no livestock production value except as a Feed Lot Operation. When a rancher sells his spread he sells his fee holding together with the leased acreage at prices roughly approaching all fee land. Ranchers will fight to keep their leases and pay leasing fees on X-number of AUMs regardless of their actual need in order in order to maintain the asking price for their property as enhanced by government grazing leases.

In conclusion we strongly urge the Bureau of Land Management to proceed without delay implementing it's proposed improvements and to take necessary steps to adequately manage and control Federal Public Lands for the benefit of the PUBLIC always bearing in mind that the public and NOT the lessees or our elected officials are the real owners of all public lands.

Sincerely,

For the Southern Arizona Environmental Council

George Oechmanek

George Oechmanek
11 East Orange Grove Rd.
Tucson, Arizona 85704

Response:

11-1 Historically arid climates or more properly, semiarid climates, have been as well suited to livestock grazing as more humid climates. More humid climates are better adapted to growing cultivated crops and are used for intensive farming. Since most cultivated crops cannot be grown in arid climates without irrigation, freeroaming livestock are comparatively efficient harvesters of native vegetation. When managed properly these animals do minimal harm to the vegetation resources.

Even though public lands produce only a small percentage of the meat in the U.S., they are an integral part of many range-farm-feedlot operations. If these lands were completely removed from grazing their loss could be much greater than their seemingly small percentage of production and could produce severe economic and social impacts in the local area.

11-2 One reason that these BLM ranges may be in poor condition is not that the allotments' licensed use has been exceeded but that livestock numbers originally adjudicated were too high. (See response 10-1.) Some ranges have not recovered from the historical overgrazing of the late 1800s and early 1900s.

11-3 Page 1-46 states the policy of the New Mexico State Land Department, not BLM. BLM will control total livestock numbers on ES-area grazing units in New Mexico proposed for intensive management. Livestock numbers authorized will not exceed the carrying capacity of the grazing unit.

11-4 As stated on page 1-40, BLM intends to adjust livestock use over a 3-year period. BLM has neither the money nor the manpower to make these reductions immediately and provide adequate supervision of these grazing units.

Units selected for custodial management are not currently suffering from abuse. Chapter 1 (page 1-23) lists the criteria for determining which units should have custodial management. Even though a unit is proposed for custodial management, BLM will continue to monitor it and take necessary action if range deterioration is detected.

11-5 Although some soils in the ES area will not withstand much trampling by livestock, many can undergo some trampling without significant increased erosion. Areas susceptible to severe erosion, such as the San Simon Valley, have been deferred from livestock grazing to reduce erosion problems aggravated by livestock. The implementation of rotational grazing systems and ephemeral grazing practices would minimize the problem since concentration areas would periodically be rested from grazing.

11-6 If the proposed action is adopted, heavy grazing will not occur. The proposed action is designed to allow moderate grazing of the area by limiting use to 40 percent of the current year's growth during most years and no more than 60 percent during other years. We will not allow greater livestock numbers than is proper for the range.

11-7 Vandalism is a problem not only to range improvements but also to recreational areas. With the vast amount of land area administered by the BLM, detection and prosecution of vandals is an immense job. With the passage of FLPMA, BLM is now authorized to take direct action against public land violations. We are also working cooperatively with local law enforcement officials regarding adverse acts occurring on the public lands. User education is an important element and will continue to be a high priority item for BLM.

SIERRA CLUB

Grand Canyon Chapter · Arizona

June 15, 1978

Bureau of Land Management
Arizona State Director (911)
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Sir or Madam,

I offer the following comments regarding the Upper Gila - San Simon Grazing Environmental Statement Draft on behalf of the Grand Canyon Chapter, Sierra Club. The Sierra Club has long been committed to conservation of the public lands and adoption of the multiple land use concept. In general, the action proposed in this document represents a positive step toward attainment of these goals, however, it does not go far enough to lead the way toward a true multiple use program.

12-1 1-6 "The general objective of the proposed action is to permit livestock to utilize a harvestable surplus of palatable vegetation - a renewable resource - and thereby produce a usable product." This statement clearly illustrates the document's prevailing theme - livestock first; public land, wildlife, other uses, second.

12-2 1-11 The rest-rotation and Santa Rita grazing systems appear to be sound. The reduction in grazing animals to carrying capacity is excellent. However, the method used to determine which grazing systems would be applied to which grazing units remains unclear. In addition, though there is discussion of "physiological requirements of preferred forage species," it is stated that "72% of the area .. (is) without an inventory of species composition and density by vegetation type." (2-37)

12-3 1-17 The purpose for adoption of the deferred rotation system and the criteria for selection appear contradictory. This system is designed to provide "rest from livestock grazing ... from 25 to 50 percent of the time." Criteria for selection of this system are then stated to include "the ability to satisfy resource management objectives without long rest periods" and "the ability to maintain range condition and plant vigor." Is this in fact a reasonable expectation?

12-4 1-22 Yearlong grazing has probably contributed in a substantial way to the unsatisfactory condition of many areas. (see 3-9) The reduction of stocking rates under this system is an improvement,

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the use of some type of rotation would be far superior. It is noted in Appendix B that a significant number of the grazing units
12-4 to continue under this system are in fair or poor condition. The assertion that areas adopted for this system included those in which fencing necessary for rotation would interfere with wildlife movement needs further explanation.

1-23 It is excellent that livestock grazing would be authorized only during favorable periods under ephemeral management. Who would conduct these range inspections? Appendix B indicates that
12-5 a large number of units presently under ephemeral grazing management will continue as such, with no apparent change. However, many of these areas are in poor condition. How will improved range conditions be effected in these areas?

1-24 Reference is made to the utmost importance of riparian habitat throughout the document. (i.e., 2-55, "...regardless of species, riparian vegetation is the most valuable wildlife habitat in Arizona.") Measures to preclude grazing in these areas in the near
12-6 future are laudable. Given the high value of this critical resource, it is questionable if the benefit derived from its future use for livestock could possibly be sufficient to warrant the time, effort, and expense involved in monitoring such an endeavour.

1-26 The rationale for choosing the location and number of new
12-7 water sources needs to be expanded upon. There is a paucity of definitive data that would indicate that such construction has in the past benefited wildlife significantly.

1-42 The Benefit-Cost Analysis indicates that 46% of the range improvements demonstrate a negative Benefit to Cost Ratio. Could there then be any justification for these? Inclusion of a break-
12-8 down of benefits would be desirable - benefits to livestock and benefits to other uses. Also important, and not included, is the cost to taxpayers of these improvements. (i.e. how much of what the taxpayer pays will benefit the livestock industry?)

12-9 1-45 The meaning of this table is difficult to ascertain.

2-28 Because the achievement of the objective of multiple land use
12-10 is so heavily dependent upon accurate knowledge of range conditions, this issue should receive very careful attention. Statements in

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the document indicate that much of the data used in determining
range conditions was contradictory and inadequate. (i.e., 3-14,
"Range conditions for the ES were estimated. Existing studies for
12-10 the district conflict greatly and are obviously in error when com-
pared with observed range condition." More consistent and up-to-
date data based on current, objective, observation techniques
should be incorporated wherever possible.

2-39 Further explanation of the complex relationship between
wildlife and livestock grazing would be helpful. For instance, the
statement that "competition between elk and livestock on public
lands appears to be relatively low" (2-47) does not coincide with
studies (i.e. Arizona Game and Fish) which indicate just the oppo-
site. Again, to say with regard to bighorn sheep that "rugged
12-11 terrain reduces competition by limiting livestock access" fails to
recognize that sheep are excluded from all areas except those which
the livestock cannot get to. Furthermore, breeding birds (game
and nongame), a very important resource in southeastern Arizona,
are impacted by overgrazing, and it would be very good to include
more detail on this.

In general, the approach taken in the ES is to look at the present
wildlife situation. Although it is admittedly more difficult to
do otherwise, it would be excellent to see discussion of these
areas in terms of what wildlife communities once existed and would
12-12 exist under optimal conditions. For example, "antelope presently
occur at one location in the ES area" (2-47). But there was a time
when this was not the case, and this does not necessarily have to
be the case in the future.

2-98 "one can assume that licensed active livestock use closely
approximates actual livestock use within the ES area..." A strong
12-13 objection must be registered against this statement. To state this
is to ignore the very important question of overstocking and its
very serious consequences for range condition. This statement is
without foundation.

3-23 "Impacts (to wildlife) would be especially adverse when use
approaches the upper value (60%) in consecutive years." 1) What
will happen if use appears to exceed this limit; will the livestock
12-14 be removed and if so, what will be done with them? 2) In these
years, the interests of livestock will be placed before wildlife.
In other words, wildlife will be considered only when it is conven-
ient to do so. This is not in keeping with the multiple use concept.

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In the fragile desert ecosystem, an increase in use of 33% over
the proper level for consecutive years could have serious conse-
12-14 quences for wildlife which are not sufficiently dealt with here.
More serious consideration should be given to the alternative
calling for further reduction in livestock numbers in order to
circumvent some of these consequences.

3-25 "Bighorn Sheep (a threatened species) will continue to com-
pete heavily for forage (with livestock) ... along the rims of
12-15 Aravaipa Canyon." Again, the priority given minimal gains to
livestock over an area of importance to wildlife is evident, and
is viewed with dismay.

3-55 The proposed action would be detrimental to over one third
of the proposed "outstanding natural areas." It would also allow
grazing to continue on the proposed research natural areas such
that the "future value of these areas as RNA's would be lost."
Considering the riparian habitat involved here (with ONA's), and
the importance of research in this area, how can the benefits to
be accrued possibly justify this?! These areas are undoubtedly
12-16 more important to wildlife than would be any man-constructed
watering holes. Note: 2-79 "All of BLM's 10 proposed natural
areas are being grazed. The present level of grazing is deterior-
ating their natural condition as evidenced by their present poor
to good range condition. The proposed outstanding natural areas
are noted for their riparian habitat, which is deteriorating and
even disappearing in some areas." To allow continuation of this
pattern in a large percentage of these areas is unforgiveable!

8-11 The economic benefits of the no-grazing and 50% capacity
12-17 alternatives could be discussed more fully. There are many eco-
nomic advantages, such as those from increased recreation, that
are not discussed.

A-3 "Deer were the only wildlife species allotted a forage reser-
vation." As the ES points out, there are many, many wildlife spe-
cies dependent upon our public lands for food and "shelter." Much
more attention to this matter is required. Until this is dealt
12-18 with sufficiently, the estimated proper carrying capacity for
livestock cannot be accurate. Note: 1-6 "The proposed action calls
for 2% of forage for wildlife." Until this is changed to reflect
the true needs of wildlife, livestock will remain the sole bene-
ficiary of our public lands.

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12-19 A-66 This appendix is very well done and serves to emphasize the lack of attention given to wildlife considerations in previous pages. These mitigating measures should be included as an integral part of the proposed action.

In summary, the proposed reduction in grazing load is a very positive step. The ES begins to resolve a very complex problem. However, it remains entrenched in the traditional vein of placing livestock as the highest priority, and until wildlife and other uses are fully addressed, the multiple use concept remains just that - a concept. We strongly urge the BLM to continue a step farther, to ensure that wildlife receives the attention that it so desperately needs, and to further the goal of making the public lands public in more than name.

Sincerely Yours,

Linda Lewis

(Mrs.) Linda Lewis
Conservation Chairperson
3737 N. Country Club Rd.
Tucson, Arizona 85716

Response:

12-1 The purpose of the ES is to analyze the impacts of livestock grazing on public land. A reservation for wildlife was made before allocating AUMs to livestock (see appendix A). In the analysis of the proposed action all other resources were considered.

12-2 The BLM specialists formulating the AMPs used their professional judgement in selecting grazing systems in the ES. One grazing system will not work in all situations. Each specialist had to weigh certain criteria for each given situation and decide which system would work best to meet resource goals.

Although 72 percent of the area is without a recent survey, BLM personnel have made field observations and determined key forage species and relative densities and compositions. Also see response 9-2.

12-3 The deferred rotation systems are proposed for all or portions of 11 grazing units, comprising 89,973 acres of public land and 57,275 acres of private and State land. In response to the several criticisms received during the comment period on the draft ES, we will evaluate these deferred rotation systems and explore possibilities for changing the grazing systems that would provide longer periods of rest.

12-4 Other alternatives to yearlong grazing (i.e. Santa Rita and rest rotation) were evaluated in these areas. Because of the rough topography and the desire to keep visual intrusions to a minimum, particularly in the Dos Cabezas Mountains, yearlong grazing systems were proposed. The Dos Cabezas Mountains are a prime wildlife area requiring a large amount of fencing to develop rotational systems. We believe that fencing would restrict wildlife movement over topography as rough as that of the Dos Cabezas. We thus believe that grazing reductions of greater than 60 percent and a heavy wildlife reservation are preferable to extensive fencing. Moreover, we feel that the livestock reductions, utilization limits and forage allocations for wildlife where none have existed before, will insure proper habitat for wildlife. These areas will be studied, and further adjustments in livestock numbers or grazing systems may be necessary.

12-5 Range condition on ephemeral ranges will be improved by issuing ephemeral licenses only when annuals are actually present. A field inspection by an interdisciplinary resource team will be required to determine if an ephemeral license will be issued and to determine the level of reservation of annuals for other resources, such as wildlife and watershed. Many of these areas are in poor or fair range condition. They also have soil limitations that preclude the establishment of a large composition of species other than creosotebush and would require years to reach climax potentials even if livestock were completely removed. The range condition would slowly improve in these areas if the proposed action is adopted.

12-6 We believe the criteria listed on pages 1-24 and 1-25 under deferment of grazing are adequate to protect the riparian habitat.

Some of the aquatic and riparian areas are proposed for fencing from livestock. Fragmented land ownership is one of the reasons for not proposing fencing of other areas.

12-7 Availability of water plays an important role in the survival and distribution of deer, antelope, dove and many nongame birds, especially during the early summer and fall. Water projects were designed to provide for wildlife and livestock needs and improve distibution by (1) providing water to previously unwatered areas (2) providing water to areas that would be cut off from existing waters by construction of proposed pasture fences and (3) providing permanent water where only seasonal water now exists. Improved distribution should improve overall forage condition and increase numbers of deer and many other wildlife specis.

We have modified chapter 1--Range Improvements--Water Developments to indicate that water developments would be located to provide an adequate distribution of water for livestock and big-game wildlife species.

12-8 Some of the B/C ratios are less than 1 to 1. They will be re-evaluated prior to construction of their range improvements and the AMPs may be modified to meet resource goals with reduced range improvement costs.

Benefit/cost is but one criterion for evaluating a proposal. Environmental and social concerns are also of prime importance in decision-making, even though in many cases their benefits cannot be quantified in dollar amounts.

Monetary benefits estimated over the period of analysis total \$2,788,000. These are divided among livestock (\$2,742,000), wildlife (\$35,000), and watershed (\$11,000).

BLM's initial total investment in the AMPs would amount to about \$784,000 and would require an average annual maintenance cost of about \$26,000.

12-9 Although table 1-4 (table 1-5 in the FES) is difficult to interpret, it is a summary of a lengthy and complex planning process portraying the individual resource recommendations, the resource conflicts, the decisions made, and the tradeoffs involved.

12-10 Data used to determine range condition were the most current mation available. Unfortunately, little data were available, requiring BLM personnel familiar with the area to make estimates.

Beginning in the initial cycle of each AMP additional data will be obtained in the evaluation procedures outlined in chapter 1. These data may be used to modify the AMPs.

12-11 The statement that "competition between elk and livestock on public lands appears to be relatively low," was confusing and not meant as a blanket statement. "Public lands," as used here, was meant to include only those public lands in grazing units 118, 119, 121 where elk do occasionally range. This area constitutes only the very fringe of the herd's range, and competition occurs only during those winters when a few elk wander off the San Carlos Indian Reservation. The text has been changed to qualify "public lands."

Mitigation measures were added to chapter 4 to protect the desert bighorn in the area of Aravaipa Canyon.

Impacts of the proposed action on breeding birds are covered in chapter 3, Birds. The impacts of overgrazing are discussed in chapter 8 under the no-action alternative.

12-12 By BLM direction, chapter 2 of an Environmental Statement is to be written on the present situation to provide a baseline to compare impacts and alternatives. The alternative in chapter 8 entitled "Elimination of Grazing on Public Lands" addresses what would occur if all grazing were removed. Adequate data do not exist to report on what wildlife existed.

12-13 For purposes of analysis we assumed that licensed use approximated actual use, since we have no reliable actual use data.

No doubt, a portion of the damage to the range has resulted from unauthorized use, but much of the damage has resulted from authorized use (i.e. licensing livestock use greater than the carrying capacity). Much of the present overstocking has been authorized. See ES pages 3-63 and 3-64.

12-14 When the utilization level in the use pasture reaches 60 percent the use of flexibility would be consider the cattle will either be moved to the pasture scheduled for rest or will be removed from the allotment.

Since the natural environment is dynamic, e.g., erratic precipitation patterns, prediction of resource responses are difficult. Thus, there is an inherent need in any action plan dealing with natural resources to have the ability to adjust the plan to unexpected changes in the environment. The concepts of "flexibility" and "modification" allow for adjustments at two levels. Flexibility refers only to temporary changes in grazing system implementation specified in an AMP. Modification refers to long-term changes in grazing management methods to the extent that a revised AMP is developed.

It is anticipated that "flexibility" will be needed more during the initial stages (first and second years) of the initial cycle of AMP implementation because rested pastures will not be available to enter into a rest rotation system. During this time, range improvements will be under construction, and stocking levels adjusted to actual resource conditions. This initial cycle in essence constitutes a phase-in period, where the proposed grazing management methods described in the AMP, are altered to bring the various rest rotation systems into operation.

Flexibility may also be needed after an AMP is operational, to adjust to unforseen conditions. In all cases "flexibility" can only be exercised within certain limitations:

- forage utilization cannot exceed 60 percent
- adjustments are made cooperatively between the allottee and BLM, with final BLM approval
- stocking levels cannot exceed the carrying capacity (current allowable use)
- resource objectives are not compromised

During the initial stages of AMP implementation, as well as during the operation of an established AMP, resource responses will be monitored and evaluated. Based on this information, "flexibility" can be exercised within limits outlined above. However, it is possible that as this data is collected, it is discovered that the proposed AMP will need some significant long-term changes in stocking levels, range improvements and/or grazing system to achieve the allotment resource objectives. In these cases the BLM and allottee will mutually develop and agree to a "modification" of the AMP. Methods to attain resource objectives would change but the resource objectives would remain the same.

The protection and/or enhancement of the basic soil/vegetal resource is the overriding consideration in determining the need for, and extent of, the use of flexibility. No action will be taken which is contrary to the stated AMP objectives. Examples have been provided as to situations in which allowance of flexibility may be considered (DES, page I-20). Conversely, flexibility cannot be authorized when resource values such as watershed, threatened and endangered species, or wildlife habitat may be significantly impacted.

The intent of maintaining a degree of flexibility is to recognize the reality of land use management. The framework within which flexibility can be authorized is well established as stated above. While specifications cannot be so ridgid that all eventualities are addressed, safeguards have been established which will assure that AMP objectives are not jeopardized through indiscriminate use of flexibility. It is not a "loophole", on the contrary, it is a tool which when used within established guidelines will result in efficient and effective resource management.

Following implementation of the AMP's, the degree of improvement will be monitored through use of techniques described in Chapters 1 and 4. If in this review and evaluation process, it is determined that certain provisions of the AMP are are unappropriate and excessive use of flexibility is necessary to overcome potentially adverse impacts, appropriate modification to the AMP will be made. If changes are necessary, the environmental impacts of the modification will be analyzed in accordance with NEPA.

In summary, the ability to adjust a livestock management plan, AMP, to changing natural resource conditions, is provided within certain limits at two levels - "flexibility" within an AMP, and "modification" to a viable revised AMP. At whatever level, or period of time a change in methods is deemed necessary, the ultimate resource objective of improving the public lands in the ES area will not be compromised.

Under FLPMA both wildlife and livestock are basic allowable multiple uses. The manager will consider the impacts to wildlife and other resources before deciding whether to remove the livestock entirely from the range or allow them to graze the rested pasture. Sixty percent utilization is considered the upper limit for moderate grazing.

12-15 Chapter 4 mitigation was changed to provide protection of the desert bighorn in the area of Aravaipa Canyon.

12-16 Under deferment of grazing (chapter 1) the riparian habitat along Eagle Creek, Bonita Creek, and the Gila Box would be fenced out, and livestock use eliminated. These areas correspond to over 80 percent of the acreage identified as the Eagle Creek, Bonita Creek, and Gila Box natural areas (table 3-13). Because livestock grazing is being eliminated in most of these natural areas, the proposed action would benefit these areas.

In other areas, continuation of grazing at reduced levels should have minimal impact.

12-17 Economic benefits that could be identified were included in the alternatives. One cannot easily attach monetary values to many watershed and recreation benefits. Also, in the case of hunting, BLM has no regulation over numbers of hunters. Big-game hunting is licensed by the AG&FD. It is questionable if a small increase in deer numbers would be reflected by a corresponding increase in hunting permits. Hunter success could increase without an increase in the number of permits sold. Monetary benefit cannot be placed on hunter success if a successful hunter spends the same amount of time and money as an unsuccessful hunter.

Watershed benefits are also difficult to assess. What, for example, is the going price for a ton of topsoil? For range management is it the cost incurred when that topsoil ends up in someone's house or is it the value that that same topsoil has, in place, for growing vegetation?

As mentioned under "elimination of grazing," fences erected by private landowners could limit recreationists' access to public lands and reduce visitor use, even though the resource may improve. For additional information relating to this subject see responses 13-22 and 13-24.

12-18 This ES was written on available information from sources such as universities, Arizona Game and Fish Department (AG&FD), New Mexico Department of Fish and Game, U.S. Fish and Wildlife Service, and BLM. Forage reservations for big game were derived from AG&FD and other existing information. At present no data exist on the forage or cover needs for most other wildlife species.

12-19 Appendix K has been incorporated into the text of the ES.

The items in appendix K were revised as follows:

(1), (2), (4), and (7) were all combined and written as mitigating measures in chapter 4.

(3) Chapter 1 was altered to show that big-game wildlife studies will be conducted in accordance with BLM Manual 6630.

(5) This item was modified to show that funds will be requested to conduct a study to determine the biological needs of white-tailed deer. It is included in chapter 4.

(6) This item was included in chapter 4 to show that livestock-desert bighorn sheep competition will be identified and livestock use eliminated from the Aravaipa Canyon area.

(8) Chapter 1--Water Developments--was changed to show that on-the-ground waters will be provided in all important areas for wildlife.

(9), (10), and (11) were all combined as a mitigating measure in chapter 4. Where physically possible riparian habitat will be protected from livestock grazing.

Steve Gallizioli

4722 W. Crittendon Lane • Phoenix, Arizona • 85031
Telephone (602) 247-8738

June 15, 1978

Mr. Robert Buffington, State Director
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

I have received the Environmental Statement for the Upper Gila-San Simon grazing district and want to compliment your staff on the completion of what must have been an Herculean task. While there are features of this document that I can approve I feel that its shortcomings outweigh its good points particularly with regard to the impacts on wildlife of the proposed action. I will key my comments to specific Pages and paragraphs.

Pages 1-11 to 18

What happens once the 60 percent maximum use is reached in a pasture on
13-1 either the Hormay or the Santa Rita systems? If they are to be maintained on
supplements they should be removed from the range or utilization will inevitably far exceed the 60 percent level.

Page 1-17

Some of the allotments proposed for seasonal grazing are rated "poor".
In such allotments wildlife, particularly deer, elk and antelope, would probably
13-2 fare better under some other type of grazing scheme. This is the time of year
when young are born and adult females require quantities of nutritious forage for milk production.

Page 1-22

Yearlong grazing is one of the prime reasons for the prevalence of severe overgrazing on semi-desert ranges. Some of the allotments scheduled for yearlong grazing are potentially excellent deer areas. One in particular, the Dos
13-3 Cabezas, has been badly abused for many years. I am pleased to note that a
drastic reduction in AUM's is planned for this area. However, I am less than pleased to note that yearlong grazing will continue. Some type of rotation grazing would be much preferred.

Member: Outdoor Writers' Association of America

Page 1-23

13-4 I am pleased to note that BLM proposes that on ephemeral ranges "Livestock grazing would not be authorized in the absence of sufficient ephemeral forage" I hope this means that no livestock will be permitted on ephemeral ranges until there is indeed forage available. In other words, the long established practice of "betting on the come" will no longer apply.

Page 1-24

13-5 Since riparian areas constitute the most valuable wildlife habitat in Arizona it is gratifying to note that such areas will be fenced and cattle excluded--at least temporarily. I question the advisability of even occasional grazing of riparian areas. The effort needed to assure that no more than 40 percent of the current year's growth in such areas is utilized can scarcely be commensurate with the value to livestock of the forage removed.

Page 1-26

13-6 The proposed addition of new sources of livestock water will be at best a mixed blessing to wildlife. It is true of course that wildlife utilize such water holes. Nevertheless, there is little hard evidence that the many hundreds of water holes constructed by AGF, BLM and others during the past 30-50 years have contributed to higher populations of any species of wildlife. Whitetail deer, mule deer, antelope, bighorn sheep and javelina are probably all at lower population levels than they were before the large scale water hole construction program began many years ago. My personal observations going back nearly 30 years are that the construction of livestock waters result in an increase in acreage overgrazed by livestock. The result is that wildlife, instead of benefiting, is worse off than before. Perhaps in the future BLM will have both the manpower and the will to prevent abuse of areas opened to livestock grazing by new water developments. As one who has observed the chronic abuse of National Resource Lands by livestock, the resulting degradation of wildlife habitat and the failure of BLM to correct the problem I find myself not at all optimistic about the consequences to wildlife of a massive effort to increase livestock water sources.

Page 1-40

13-7 Giving priority to critical wildlife habitat is a good suggestion but what is "critical habitat"? How will the determination be made--as it must be if critical habitat is to receive first consideration.

Page 1-42

13-8 According to this table on approximately 46 percent of the grazing units

13-8 the cost of the proposed range improvements will exceed the benefits. Is it proposed to make such improvements anyway, despite the unfavorable B:C ratio?

Page 1-45

13-9 This table is confusing and difficult to interpret.

Page 2-35

13-10 I find it hard to understand how the values of this figure could fluctuate as much as they apparently did. How can mountain shrub canopy go from 5 percent in 1960 to 28 percent in 1961? I don't think it's possible for vegetation of this type to make such drastic growth in a period of one year.

Page 2-37

13-11 The relationship between rainfall and vegetation is not at all clear from Figures 2-2 despite the statement in paragraph 4. High years in precipitation do not appear to coincide well with peaks in grass production. Regression analysis might help clarify the picture. I would question too, in the same paragraph, the statement that climate, more than livestock grazing, is responsible for the vegetation changes of the past 20 years. What evidence is there to support such an assertion? Cattle exclosures that I personally have inspected suggest the opposite.

Page 2-43 par. 2

The reason forage conditions are better in these areas is because they are devoid of water! In the presence of water livestock would have overgrazed such areas and precluded forage conditions being good. Paragraph 3 is excellent and puts the problem in perspective.

Page 2-44 (par. 3 under whitetails)

The fact that "whitetails have selected small isolated areas...where little livestock grazing has occurred..." speaks for itself. I know from many years of experience that this little deer is less tolerant of heavy cattle use than mule deer. The best whitetail populations are invariably in lightly or ungrazed areas. Whitetails can "survive in heavily grazed areas", as stated in this paragraph, but not in numbers satisfactory to either hunter or nature lover.

Page 2-47

13-12 The statement that "competition between elk and livestock on public lands appears to be relatively low" is surprising and at odds with studies made in a number of states. Research by AGF on Beaver Creek and by others in Oregon, Montana and California has shown not only that there is serious competition for forage, but that there is even competition for space--elk move out of an area (if they can) when cattle move in.

Page 2-50

Paragraph 2 inadequately explains the relationship of bighorn to livestock in this area. Bighorn sheep, even more than elk, are intolerant of cattle. To say that the "rugged terrain...somewhat reduces competition by limiting access..." is to ignore the fact that competition for space and forage
13-13 between cattle and bighorns in areas less rugged restricts the bighorns to areas the cattle shun. In the absence of cattle and with consequently improved forage conditions the territory adjacent to the rugged regions would also be used by bighorns. The potential for population growth of bighorns in this area would be considerably greater if livestock were not a complicating factor.

Page 2-90

It is difficult to understand the rationale used to rate different areas for their recreational values. It would seem to me that both Aravaipa Creek
13-14 and the San Pedro would receive top billing under "Sightseeing", both for their attractiveness as bird areas and also for their scenic values.

Page 2-98, par. 3

I find it difficult to accept the statement that "One can assume that licensed active livestock use closely approximates actual livestock use within the E.S. area", particularly when, in the next paragraph, comes the admission that "...livestock trespass cases in the Safford district has increased in the past 3-4 years...". The fact that "...this increase has probably resulted largely from increased manpower available to supervise, etc." does not accurately reflect the situation. The "increase" is in the number of detected cases of trespasses. It is probably safe to assume that there has been no increase in actual trespass but the significant point is that it would not be possible to detect more trespass by using more manpower if trespass was not occurring.

13-15 The last sentence in this paragraph needs clarification. If "Not all trespass cases have involved exceeding licensed livestock use", what was the extent of trespass that exceeded licensed use? Over the past five years how many licensees are known to have violated the provisions of their license by exceeding licensed use? How many licensees are known to be guilty of repeated trespass of this type?

On April 3, 1976, former BLM Director, Curt Berklund, in a speech in Elko, Nevada, said: "There are about 400 livestock grazing trespass cases that are detected annually bureau-wide, and I am sure there are at least 400 others that go undetected...obviously unauthorized grazing use has been a serious problem..." Is there any valid reason for assuming that unauthorized grazing has not been

equally as serious a problem on this grazing district as Berkland indicated
was typical of National Resource Land generally? Isn't it more likely, in
13-15 fact, that much of the damage to the range in this district has been a result
of unauthorized grazing?

Page 2-123 to 125

The charts predicting trend in selected wildlife species under existing conditions and under conditions of "optimum" livestock numbers are well done and in my opinion probably reasonably accurate. The significant fact is that wildlife will continue to decline if livestock numbers are not reduced.

Page 3-22

The last sentence in the first paragraph under "General" should be printed in red caps and heavily underlined! The balance of the discussion on this subject is also excellent although I do have a few specific comments.

Page 3-23 (First par. under Mule Deer)

This is an oft-repeated "truism". I can't argue with it. It is indeed
true that "if not exceedingly heavy" livestock grazing is usually not detri-
mental for mule deer. More often than not, however, the idea that gets conveyed
is that livestock grazing has no ill effects on deer populations. What is over-
looked is the qualifier--"if not exceedingly heavy". Whether, in some cases,
"grazing can improve conditions for deer", however, has yet to be determined
13-16 by anyone . The references cited merely say this is so. They adduce no data
to support the assertion. Truett, in fact, contradicts himself by reporting
personal observations that indicate <u>only</u> that livestock grazing was <u>detrimental</u>
to mule deer. Despite such observations, later in his Thesis he, apparently
without even a smidgin of information to support it, concludes that grazing may
actually improve habitat conditions for deer!

Page 3-24

The footnote in Table 3-7 states that bighorn sheep might decline in the
future if the proposed action is implemented. This species is listed in
Group III of Arizona's Threatened Wildlife of Arizona, a category analogous to
13-17 the federal Threatened classification. As such the bighorn deserves more con-
sideration in this E.S. than it is receiving. It is unconscionable to permit
a degree of livestock use in the Aravaipa area that BLM expects to bring about
a decline in this population of bighorns.

Page 3-32

The third sentence in paragraph 2 recognizes the serious consequences of
13-18 yearlong grazing and the superiority of systems that provide for periods of

13-18 rest. Why then does BLM not place the entire grazing district under these admittedly superior grazing systems?

Page 3-67

13-19 At what point in time are these predicted improvements in livestock performance to occur? Certainly it can't happen until sufficient time has passed for significant range improvement to have taken place.

Page 5-2 to 3

13-20 It is clear from the discussion of p.5/2 and the Table on 5/3 that livestock grazing during periods of low range productivity (during the frequent droughts) is detrimental to many forms of wildlife, the severity of the impact depending largely on the duration of the drought. It follows therefore that if BLM does not take steps to eliminate grazing at such times it violates a basic principal of the multiple-use concept and demonstrates again that livestock grazing is the dominate use of National Resource Lands. It appears that wildlife is to receive consideration only when such consideration does not interfere with livestock grazing. As one of the 210 million owners of these public lands I want to enter my personal and strong protest at this evidence of a willingness on the part of BLM to continue to cater to one special interest user group, a group that in reality consitutes a minuscule minority of the people with an interest in National Resource Lands.

Page 8-11 to 18

13-21 It is clear from the discussion on these pages, and from the table on page 8/3 that, from the standpoint of all values except grazing, this alternative is far superior to any other. The argument that problems would develop with access to public lands ignores the fact that if this alternative were adopted it would then be worthwhile for ranchers and the State Land Department to "block up" their holdings by making appropriate exchanges of private and state lands for BLM lands. This would reduce the amount of fencing required by ranchers and State Land Department and make for a more efficient operation all around. In doing so the problem of fenced and posted private lands blocking access to public lands would be minimized.

The economics of the no-grazing alternative have not been adequately addressed. Certainly there is more involved than what has been presented.

The decline in ranch values, for example, is largely due to the value of the grazing lease, a value these leases should never have acquired and one that would not now exist if ranchers actually had to pay a grazing fee that truely reflected the value of the forage their cattle consume.

13-22 Ignored in the economic considerations is the cost to the tax payers of the range improvements proposed in this E.A., both the initial cost and the annual maintenance estimate. (Neither of which, curiously, seem to be given in the E.S. Atany rate I have been unable to find cost estimates for such improvements.)

13-23 Also ignored is the reduction in BLM manpower which would be possible if this agency no longer had to be concerned with the multitude of duties associated with the regulation of livestock grazing. Certainly this item alone should constitute a significant savings in tax dollars.

13-24 Nor is there any mention of the increase in other uses of National Resource Lands which would inevitably result from the elimination of grazing. More hunting of both big game and small game would occur. More attractive rangelands supporting a greater abundance of wildlife would attract more bird watchers, photographers and nature lovers in general. All such people would contribute to both the state and local economy in their purchases of supplies, equipment and services.

These are just a few of the economic ramifications of the no-grazing alternative that have been ignored. To a lesser degree they apply equally to the 50 percent grazing capacity alternative.

It is obvious that neither of these alternatives have been given adequate consideration.

Page A-66

13-25 It is clear after a thorough review of this document that wildlife is not receiving the consideration it should receive in this proposal. Nowhere is this more apparent than in Appendix K which does an excellent job of addressing the problem of impacts to wildlife that will occur under this proposal. These are mitigation features that must be incorporated into this proposal if wildlife is to receive the consideration it deserves. I urge BLM officials to adopt each of the well thought out recommendations contained on pages A/66-67. In lieu of eliminating grazing entirely on this long and woefully abused grazing district, these measures must be adopted.

I hope that in the final draft the shortcomings noted above will have been considered and that a more acceptable document will be produced.

Sincerely,

Steve Gallizioli

Steve Gallizioli

Response:

13-1 The maximum utilization allowed under the proposed action would be 60 percent. Once this figure is reached, cattle would either be moved to the pasture scheduled for rest or would be removed from the grazing unit. Also see response 12-14.

13-2 Criterion #4 under Seasonal Grazing (chapter 1), has been deleted, since it was a criterion for allotments already on a seasonal grazing system to determine the effectiveness of that system. Some of these grazing units do show the majority of the allotment in good condition and are already functioning under seasonal grazing. On other allotments, the allottee has had private land or other facilities enabling him to remove the cattle from the grazing unit for certain periods.

Although spring and summer are important for wildlife, we believe that the 40 percent utilization goal will provide sufficient forage for wildlife.

13-3 See response 12-4.

13-4 See response 12-5.

13-5 Grazing of the riparian areas, if allowed at all, will follow strict guidelines and will only be authorized to accomplish resource goals. Also see responses 12-6 and 12-16.

13-6 Livestock waters may be both beneficial and detrimental to wildlife. The water developments identified in the ES will only be developed when the grazing management system is implemented. Therefore, the level of livestock grazing use will never exceed the maximum available use identified in the individual allotments.

In the past, BLM developed many new livestock waters in areas previously unused by livestock. These developments were built without implementing a livestock management system keyed to proper range utilization.

We have modified chapter 3 - Animals - Impacts Associated with Proposed Range Improvements - to reflect that these new livestock waters may be beneficial, as well as, detrimental to wildlife.

13-7 Critical habitat, as used here, refers to habitat areas identified as being of major importance to survival or perpetuation of one or more wildlife populations or as constituting a significant portion of the geographical range of one or more populations. Critical habitat, as used here, may include, but is not restricted to, "Critical Habitat" as defined in the Endangered Species Act.

The District wildlife staff determines critical habitat, using the best available information, including that supplied by the AG&FD and other sources.

13-8 See responses 5-2, 9-14, and 12-8.

13-9 See response 12-9.

13-10 Figure 2-6 shows a dramatic fluctuation in shrub canopy. Certainly the possibility exists that reading error occurred. The information presented, however, is the best available.

13-11 Regression analysis might clarify the relationship between grass production and rainfall, but such an analysis was not made. Moreover, rainfall data from the weather station closest to the transects were plotted, not the actual rainfall at the site.

From data presented in the ES on pages 2-34 and 2-35 one can see a correlation between precipitation and vegetation cover.

Hastings and Turner (1965) discuss the influence of livestock grazing and climate on vegetation in southern Arizona and Sonora, Mexico. They state that, "The probability that large-scale grazing in Sonora between 1700 and 1880 had no marked effects seems to indicate that grazing, in itself, was not enough to initiate the changes. The evidence from sites like MacDougal Crater and the Melissa Islands indicates, furthermore, that some of the changes have occurred where cattle have never been, and are, therefore, probably the result of climatic variation alone. On the basis of this reasoning climate has to be accorded the more important role of the two."

"About cause, then, the best answer seems to be that the new vegetation--if one may call it that--has not arisen from climatic variation alone, but in response to the unique combination of climatic and cultural stress imposed by the events of the past eighty years; that climate and cattle have united to produce it."

13-12 See response 12-11.

13-13 Chapter 2 of the ES has been changed to reflect the competition between livestock and bighorns.

13-14 Table 2-17 lists areas impacted by livestock grazing and identifies the recreation resource qualities of each area. Public lands in Aravaipa Canyon are not subject to grazing, and Aravaipa was thus not included. Public lands in the San Pedro Valley are minimally affected and, therefore, not included in the table. We agree that both areas have high sightseeing values, which is reflected on Map 2-19 showing the visual resource management class of areas.

13-15 We cannot assume that no increase in actual trespass has occurred. For purposes of analysis we did assume that licensed use approximated actual use, since we have no reliable actual use data.

The following responses are in reply to specific questions:

1. What was the extent of trespass that exceeded licensed use?

Answer: 89 percent.

Twenty-eight livestock grazing trespasses have occurred in the last 5 years of which three were trespasses because of livestock being in the wrong pasture.

2. Over the past 5 years how many licensees are known to have violated the provisions?

Answer: 23 different violators.

3. How many licensees are known to be guilty of repeated trespass of this type?

Answer: Three licensees have trespassed more than one time in the last 5 years.

No doubt a portion of the damage to the range has resulted from authorized use (i.e. licensing livestock use greater than the capacity, see pages 3-63 and 3-64).

13-16 Under certain circumstances livestock grazing can indeed improve habitat conditions for deer or at least help maintain deer habitat. Livestock grazing can return climax grassland to sub-climax seral stages or help to maintain a sub-climax stage where browse will be or may be more abundant. Livestock may also benefit deer populations by helping to keep palatable shrub species within reach of deer. Proper stocking rates in relation to deer numbers is the key. Livestock numbers have been reduced in most areas, forage allowances have been made for deer, and mitigating measures have been developed for years of low forage production. (See chapter 4, Mitigation, which has been changed to include additional mitigating measures for wildlife).

13-17 Chapter 4 was changed to provide protection of the desert bighorn in the area of Aravaipa Canyon.

13-18 The serious consequence of yearlong grazing primarily refers to areas near water. The entire ES area was not proposed for a rotation grazing system for complex reasons. Topography, land ownership, resource constraints and other factors were used in selecting the type of system to be proposed. Yearlong grazing with proper utilization will allow the range resource to improve and will allow us to meet our resource goals.

13-19 The anticipated results in livestock performance are expected within 15 years after the implementation of the propsed action.

13-20 See response 12-14.

13-21 BLM manages public lands under a concept of multiple-use. Livestock grazing is a legititmate use of public land. BLM's mission is to minimize conflicts among multiple-uses and allow these uses if resource goals are not jeopardized. We feel that the proposed action would minimize conflicts with other uses and allow us to meet resource goals.

The elimination of grazing on public lands would also be virtually unenforceable because of the large amounts of State and private lands intermingled throughout the ES area. Most seasonal and permanent waters are located on non-Federal lands and are maintained by the allottee. The elimination of grazing would severely impact wildlife due to loss of permanent waters.

The Federal government can not formally recognize the value of grazing leases when they are issued, renewed, or cancelled. The private sector, however, does attach a value to them. Grazing fees are set by the agencies under the direction of Congress.

13-22 Under both the limited management and the elimination of grazing alternatives, capital investment would be necessary. Average costs were used to estimate both the initial investment and BLM maintenance costs. The limited management alternative is expected to require an investment of about $192,800 and an annual maintenance cost of about $2,500. The elimination of grazing would require an estimated investment of $5,250,000 and an annual maintenance cost of $21,000. Also see response 12-17.

13-23 It can also be argued that BLM manpower would have to be increased to enforce complete and continued removal of livestock from the public lands. Any trespass problem we now have might be pale in comparison to the one we would have if cattle were eliminated from the public land.

13-24 BLM manages wildlife habitat but has no control over the amount of hunting that will occur. Any increases in hunting licenses is at the discretion of the AG&FD. Hunter success might improve without an increase in the number of licenses issued. Other use might increase, but the magnitude is expected to be low. Data are not available to fully predict what increases might result solely from the elimination of livestock grazing.

Under the elimination of grazing alternative, the ES states that most wildlife populations would increase more rapidly to a climax population, after which some would decline. Only areas with natural waters would become good wildlife habitat. Areas on public lands in which water developments are maintained by allottees would probably be lost for lack of water. Most private land owners would be expected to close their lands to hunting, in effect, blocking access to many public lands and offsetting increases in wildlife numbers available for hunting. The net effect would not be expected to change hunting benefits significantly from the proposed action.

Increases in the nonconsumptive use of wildlife would probably also face restricted movement by fenced ranges, if not limited entry on private lands. It is questionable that the "no grazing" alternative would produce a situation sufficiently unique to draw a significantly larger visitation to the area. We have little experience in this area from which to estimats impacts.

The 50 percent grazing capacity, no-action, and limited management alternatives were analyzed on the basis of average changes in animal numbers. The actual change may be less significant, depending on the number of permits that AG&FD chooses to issue.

Under the 50 percent grazing capacity alternative, wildlife would build up more rapidly than under the proposed action. With the increased average herd sizes and the change in build-up period, average annual benefits would increase by an estimated $630 per year over the proposed action.

The "no-action" and "limited management" alternatives were also evaluated. The no-action alternative would reduce the average annual benefits from the proposed action by an estimated $3,260. The limited management alternative would show an average annual benefit of $950 or $1,350 less than the proposed action.

13-25 See response 12-19.

June 13, 1978

Robert Buffington,
Arizona State Director
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

In response to the environmental situation that is to be commented on by June 19, 1978, I would like to say that any efficient cowman will make wise use of his country in order to stay in business. The cattle industry is an integral part of the economy of this great nation.

Efficient cattle people work hand in hand with good environmental practices. We enjoy wild life as well as any city dweller. Who do you suppose maintains the waters, salt grounds and supplemental feed for the wild life as well as cattle? It certainly is not the city dweller.

Local conservation districts, FFA, and 4-H groups enlighten ranch families on the latest practices on efficient conservation of useful grasses, weeds and shrubs, range rotation and other sound ideas. This, along with the experience that a rancher gains from living on a ranch for many years, should certainly make him an expert on the subject.

14-1 I'm curious - what are the qualifications of a resource specialist professional?

Sincerely yours,

Jim Wilbourn

Jim Wilbourn
WILBOURN RANCH
Route 1 Box 114
Douglas, Arizona 85607

ARIZONA STATE OFFICE
BU LAND MANAGEMENT
JUN 16 '78
SD 1
ASSOC SD
PCS 3
RESOURCES 2
TECH SER
MGM'T SER
PUB. AFF
CF
ACTION
INFO.
SEE ME

San Simon ES File

Answer last ¶

6

Response:

14-1 See response to hearings comment #6.

Natural Resources Defense Council, Inc.

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June 16, 1978

Mr. Robert O. Buffington
State Director
Arizona State Office
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Re: Upper Gila-San Simon Grazing Environmental Statement Draft

Dear Mr. Buffington:

Historically, domestic livestock grazing in the Upper Gila-San Simon area of Arizona has been improperly managed. Improper management practices, including over-grazing and year-long grazing, continue to be permitted today. (page 3-64.) 1/ As the result of these practices, public resources of the study area have been, and are being, severely and extensively damaged: watershed areas are severely deteriorated; wildlife populations have been diminished and their habitat areas have been abused; range conditions throughout the study area have been degraded. The draft environmental impact statement (EIS) clearly reveals that changes in current grazing management are desperately needed and long overdue.

The proposed action which is the subject of this draft is indicative of a genuine intention to eliminate over-stocking and stem the associated resource deterioration. In this respect alone, the Upper Gila-San Simon is dramatically different from the original grazing EIS released by the Bureau of Land Management (BLM), the Challis, Idaho statement. In other respects, too, including, for example, its tone, candor and length, this draft constitutes a significant improvement over the Challis EIS. Despite these differences, however, this statement suffers from some of the same fundamental defects as did the Challis and other, earlier statements, particularly in connection with its treatment of grazing capacity, its analysis of impacts and the alternatives which it considers. In commenting on previously-

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1/ All page references are to the draft impact statement.

released statements, we have discussed these defects at length and described in detail the kinds of information and analyses which are required to remedy them. We have enclosed a copy of our comments on an earlier draft, and rather than discuss this statement extensively, we offer the following brief comments on its contents for your consideration.

15-1 Like all earlier impact statements, this draft fails to utilize the information it contains to analyze the ability of the areas involved to sustain the proposed level of livestock grazing, given their current conditions. For example, the draft's authors appear to assume that the proposal to eliminate over-grazing counteracts the necessity of analyzing the proposal to continue to graze the Van Gausig Grazing Unit, for example, all 10,700 acres of which are in poor condition class and half of which is in high erosion condition class. (Page A-17, App. B, Unit No. 54.) Similarly, the fact that the applicable Management Framework Plans (MFPs) authorize grazing pursuant to Allotment Management Plans (AMPs) or grazing systems, (page 1-43), does not absolve the Bureau from fulfilling its obligation to analyze the MFP objectives relating to grazing, as well as to explain the rationale for the selection of the grazing systems involved in the proposed action. Although the draft statement deals with both of these issues in a more satisfactory manner than did the Challis statement, its treatment of them still falls short of what is required.

15-2 The draft statement purports to identify the resource trade-offs made during the course of MFP preparation. (<u>See</u> Table 1-4, page 1-45.) It fails to explain the rationale for the important decisions resolving livestock conflicts with other resources, however. For example, the draft does not explain why it was decided to revise grazing systems and allow continued erosion in the Geronimo Planning Unit rather than eliminate livestock grazing and protect the watershed cover. (<u>Id</u>.) Moreover, it is clear that Table 1-4 does not in fact reveal all the conflicts between livestock grazing and other resources of the area. For example, Table 1-4 does not acknowledge the conflict between livestock and big horn sheep in critical habitat areas of the sheep which the draft predicts will continue even if the proposed action is implemented. (<u>See</u>, <u>e.g.</u>, Table 3-6, p.3-20.) The draft's failure to identify such conflicts in discussing the applicable MFPs suggests that they were not in fact identified during the development of those basic land use plans. This, in turn, reinforces the Bureau's obligation to analyze the degree to which the MFP can serve as an adequate multiple use plan for the lands involved.

15-3 Unlike other impact statements, the Upper Gila-San Simon draft does present criteria for the selection of the grazing systems involved in the proposed action, including especially the different intensive management systems. (<u>See</u>, <u>e.g.</u>, pp. 1-11, 1-12, 1-14.) It makes no attempt, however, to demonstrate that the criteria set forth were met in the selection of particular systems. Indeed, the impact statement reveals that one

of the criterion for custodial management, an "acceptable"
15-3 range condition, was not met in the case of the Franklin Grazing Unit
which is in "poor" range condition class. (pp. 1-23, A-17,
App. B, Unit No. 40.)

As indicated, this draft, like other grazing statements,
fails to substantiate the predicted benefits of implementing the
proposed intensive management systems. Like those statements,
this draft relies upon the theory upon which those systems are
based to justify the predicted benefits, 2/ rather than any
analysis of the actual results of their implementation in other
places. Even assuming these systems are theoretically sound
and that the potential exists for the predicted amount of
15-4 vegetative improvement, the EIS must demonstrate that it is
reasonable to assume the claimed results will occur. In the
absence of such a showing, as well as the kinds of information
and analyses described above, readers are unable to answer the
key questions involved in grazing management: 1) How much
livestock grazing, if any, should be allowed in the areas in-
volved? And, 2) How should that amount of grazing be managed?

The draft's treatment of alternatives to the proposed
action is inadequate. Impact statements are required to contain
"detailed and careful" analyses of the proposed action and
possible alternatives in order to reveal their"relative environ-
mental merits and demerits". NRDC v. Callaway, 524 F.2d 79, 92
(2nd Cir. 1975)(Emphasis added). However, the discussion of
15-5 alternatives in this draft is superficial, conclusory, brief,
and self-serving. Moreover, it fails to analyze any of the
alternatives in terms of the individual proposed grazing areas
and indeed, gives no indication that such analyses were ever
prepared. It clearly suggests that the alternatives are not
true management options, but were developed only for academic,
theoretical purposes.

In conclusion, we urge you to correct the defects of this draft summarized above to the fullest extent possible, so that the needed changes in existing management can be identified and ultimately implemented. If we can be of any assistance to you in these efforts, I hope you will not hesitate to contact us.

Sincerely,

Johanna H Wald

Johanna H. Wald

JHW:sja
Enclosure

2/ Surely, useful information exists concerning the results of implementing the Santa Rita system which was developed in Southeastern Arizona. (p. 1-14.) Such information should be included in the final version of the document.

Response:

15-1 Continued grazing is proposed for the Van Gausig grazing unit #54 with a reduction in allowable use to the carrying capacity (See appendix B). Carrying capacity by definition is "the maximum stocking rate possible without inducing damage to vegetation or related resources."

The grazing unit is in a poor range condition, but range condition is based on the potential kinds and amounts of vegetation present in a climax condition. The grazing unit may produce as many pounds of vegetation as present under climax conditions, but the plant species may be different from the climax. The Van Gausig unit has suffered from the invasion and increase of mesquite, burroweed, and snakeweed and a decline in the percent composition of grasses. This unit can be grazed by livestock within the proposed utilization limits and meet the resource goals identified. The erosion condition class will improve with improvement in the vegetation cover.

The grazing systems proposed in the ES were selected on the basis of the professional judgement of the writers of the AMPs. One grazing system will not work in all situations. The criteria listed on page 1-11 were applied to determine the system to be used. Each specialist had to weigh these criteria for each given situation and decide which system would work best to meet resource goals. As noted in response 12-3 and DES chapter 1 the seasonal grazing systems will be studied after implementation and needed changes will be made.

15-2 Erosion is a natural process of a wearing away of the land surface by wind, water, and other geological agents. Erosion will continue in the ES area whether or not livestock grazing is continued. The proposed action would aid in reducing erosion. Given the characteristics of the soils in the ES area (See table 2-1) no management method would significantly change the amount of erosion within the 15-year goal of the proposed action. The fragile desert ecosystem is slow to heal.

The MFP summary (table 1-5) does not reveal all resource conflicts. This table is a summary of a lengthly and complex planning process involving four planning units. The MFPs were developed on the basis of contributions from numerous public committee meetings and several general public meetings.

Chapter 4, Mitigation, was changed to provide for the protection of the desert bighorn sheep in the area of Aravaipa Canyon.

15-3 The first criterion mentioned for custodial management on page 1-23 is small, isolated or intermingled tracts of public lands, generally smaller than 640 acres, having no significant multiple-use values or potentials. The maps used for predicting range condition were of too small a scale to allow the accurate assessment of small acreages. (See appendix A.) The management status and resource condition of the 380 acres of public lands in the Franklin grazing unit 40 will be evaluated, as will other grazing units. If needed, a change in proposed management will be adopted.

15-4 Actual results obtained from the implementation of grazing systems in other places provides an estimate of what kinds of changes can be expected in the ES area. One cannot exactly predict what changes the implementation of grazing system will have in the ES area because studies on grazing systems have not been conducted in the ES area or in an area with exactly the same climate as the ES area. For example, in a study conducted at the Santa Rita Experimental Range, a difference of from 0.04 to 0.63 inch of average summer rainfall was enough to account for from 5 to 79 pounds difference in perennial grass production (Martin and Cable, 1974).

Less than 1 inch of average summer rainfall thus can make a great change in vegetation production. Summer rainfall within the ES area may vary in a single year by as much as 10 inches. Strictly comparing one study with another, without considering subtle climatic variations, can be misleading and erroneous.

The amount of livestock grazing permitted will be determined by range inventories and utilization studies compared to livestock actual use data. How grazing should be managed will be based on the evaluation procedures outlined in chapter 1, the mitigative studies noted in chapter 4 and the flexibility considerations noted in response 12-14.

15-5 The alternatives discussed were given detailed and careful analysis with all available information. The no-action and elimination of grazing alternatives present both extremes of grazing use on the resources. The analysis is developed from existing information contained in chapter 2. Chapter 8 summarizes data from individual proposed grazing units and provides sufficient information to allow the public and the decisionmaker to make a reasoned judgement on the merits of the alternatives presented.

We believe the alternatives discussed in the ES present a full range of options for consideration in the decisionmaking process.

16

J. E. BROWNING

Muleshoe Ranch PO Box [illegible]
WILLCOX, ARIZONA

QUARTER HORSES

PUREBRED HEREFORD CATTLE

June 15,1978.

Mr Robert Buffington,
Arizona State Director
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Sir:

This has reference to the request for comments on the use and past use of B.L.M. lands:

I came to Arizona by wagon in 1914 at the age of fourteen years. We passed thru the San Simon Valley and it was obvious that there was very little forage and many cattle and is very much the same today only that there are very few cattle.

It should be remembered up until the passage of the Taylor Grazing act these Public Domain lands were used by everyone and in many instances these lands, , pafticularily around watering places, were so over used that they have not recovered and never will. It also should be remembered that these lands ~~was~~ were those left over after everyone got what they wanted, the Homesteader, the Indians, the Forest Service and on and on and the impression is today that these were very fine grazing lands that were destroyed by overgrazing which in most instances is not true.

16-1 When the Taylor Grazing Act was passed, supported by the Ranchers, it was thought and stated in the Act that these lands would be administered by the Bureau of Land Management until final disposal . The Ranchers fenced and watered those lands alloted to them at their own expense and with the thought that sometime they would have an opportunity to acquire, instead they are being administered by a very expensive Bureau with very little revenue to the local tax base. The present user is being accused of over grazing in areas that never were productive and some areas that were ruined before the passage of the Taylor Grazing Act.

As a matter of Information I worked as a Cowboy for the Monk Bros Ranch and rode most of the BLM area of Cochise Couty. I was recently sent a Certificate of Recognition having served on the first Committee in Ariz. under the Agriculture Adjustment Act of 1933. Have served as President of the Arizona Cattle Growers and a life time interest in the Range use of Arizona.

Respectfully Submitted.

J E Browning

Response:

16-1 The Federal Land Policy and Management Act of 1976 has changed the law regarding management pending final disposal of public lands. Some lands will no doubt be disposed of, but the bulk of them will be retained in public ownership.

In some cases ranchers did fence and provide water to public lands. In many cases the Civilian Conservation Corps provided fencing and water development during the 1930s and 1940s.

Many areas are not productive livestock forage lands and have not been productive in the past. Nevertheless, much of the ES area is producing below its potential and can be improved.

"In lieu" funds are distributed to counties to offset the loss of tax base. Also see response 5-6.

THE WILDLIFE SOCIETY

ARIZONA CHAPTER

P. O. BOX 35414 PHOENIX, ARIZONA 85069

June 20, 1978

Mr. Robert Buffington
State Director
Bureau of Land Management
Arizona State Office
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

Our Chapter has reviewed your draft Upper Gila-San Simon Grazing Environmental Statement.

We are pleased at the effort made addressing the impacts to game and nongame wildlife that would result from the proposed action.

We believe this statement is of particular importance because it is the first in a series of environmental statements concerning grazing on natural resource lands and thereby setting the stage for discussion of the various actions and alternatives with their resulting impacts.

We provide the following specific comments using chapter and page number designations.

1-9 last paragraph

We are confused over the phrase, "...utilization of key forage species
in the key areas would average about 40% over a period of years." If
this pertains to the entire allotment, some individual pastures may
17-1 receive heavy, deteriorating use. We prefer using the definition of
proper stocking found in the last paragraph of 1-5 which would average
the number of livestock required to consume 40% of the perennial forage
production rather than to average the forage.

1-11 Rest-rotation

This sytem will benefit wildlife if the species are able to move to an
unused pasture. For sedentary species, however, sufficient forage,
17-2 cover and water will be required in the use pasture. Thus it appears
important to insure that utilization will be based on the carrying
capacity of each pasture and not an average of the entire allotment.

17-2 For this and other grazing systems we wonder what the procedure will be once 40 percent of the perennial forage has been utilized by livestock. Their removal from the pasture and subsequent feeding regimen should be discussed.

1-14 Santa Rita...Rotation

17-3 This sytem, based on research in southeastern Arizona should provide good management of wildlife species as well as livestock. We note that allotments that BLM will manage under this system are presently in poor to fair range conditions and are presently stocked above present carrying capacity. We recommend stocking these ranges below the determined carrying capacity in the beginning, thus allowing the vegetation to improve more quickly than under full capacity stocking. Once the vegetation is established, stocking at the carrying capacity should be allowed.

1-16 Deferred Rotation

17-4 The successful use of this system has not been borne out in practice. We would prefer combining these allotments with other allotments under rest rotation on the Santa Rita system.

1-19 Seasonal Grazing

17-5 One of the primary criteria for selecting this system is that "...the range is either maintained in good condition or is on an upward trend." We could not check the trend since it is not shown but we did check the present condition of eight of the 17 seasonal use allotments (numbers 49, 52, 58, 71, 78, 85, 91 and 134) and found they were in poor to fair condition.

Spring and summer grazing have a severe impact on most wildlife species particularly large ungulates that need considerable amounts of forage for lactating females and growth of juveniles.

1-22 Yearlong-Grazing

17-6 To wildlife, yearlong grazing is probably the worst system of range management that could be implemented. There appears to be a conflict here as one of the purposes of the proposed action is in providing forage and other needs to wildlife yet 38 percent of the AUM's reserved for wildlife are in allotments utilizing this system.

It is particularly distressing to see areas that support or potentially could support excellent mule deer populations are to be managed under yearly grazing. For example, three grazing units in the Dos Cabezas (numbers 72, 73 and 74) were allocated 252 AUM's for mule deer (more than 1,000 deer). Because most of the area is in poor to fair condition, 17-6 we feel that under yearlong grazing even the 60 to 78 percent reduction will not allow for the stated wildlife use. Another high density deer use area is in the Dripping Springs-Mescal Mountain area (numbers 117-121 and 123). This area is allocated 479 AUM's of mule deer use (1,900 deer) but it too is proposed for yearlong grazing. Another type of grazing management should be recommended for wildlife areas such as these.

1-23 <u>Ephemeral Grazing Management</u>

We are in complete agreement with your definition of euphemeral range management which is based on inspection after the rain and favorable growth and not before forage is available.

1-24 <u>Deferment of Grazing</u>

We support this type of management that would protect this most valuable but dwindling habitat - the riparian and aquatic wildlife habitats. Fencing and exclusion of livestock will most certainly improve these areas, even if it is only temporary. We believe this habitat's value to wildlife should prevent even occasional grazing by livestock.

1-26 through 39 (Range improvements)

17-7 Additional livestock watering facilities may only permit extension of cattle into areas heretofore not extensively grazed. Although there is some benefit to wildlife, the overall impact may very well be a loss to wildlife. Before any new areas are opened to grazing by providing water, it may be well to improve management of existing areas.

1-29 <u>Pipeline</u>

At existing and necessary new pipelines we support the plan to provide water at ground level in desirable wildlife habitat.

1-30 <u>Water Troughs</u>

We support the installation of escape devices for wildlife at existing and proposed troughs.

1-32 <u>Water Storage Tanks</u>

17-8 We would opt for the fixed rather than the floating cover design since the chance of an animal being trapped would be almost nonexistent.

1-34 <u>Rainfall Catchments</u>

17-9 We support providing yearlong water at ground level for wildlife. The butyl rubber bag mentioned has not stood up well to the high temperatures in the southwest and, therefore, galvanized sheet metal or concrete storage tanks would be preferable.

1-36 Spring Developments

We support leaving sufficient water at the springs for the enhancement of the lush riparian growth surrounding them and fencing to exclude cattle from this growth.

1-37 Detention Dams

17-10 Management of these facilities should include development and maintenance of riparian growth. Moreover, a separate environmental assessment on these structures would be useful.

1-40 to 41 Steps in Implementing the Proposed Action

17-11 Establishing the highest priority to "critical" watershed and wildlife habitat areas is most certainly a laudable plan. We believe a definition of "critical" will be necessary in order to set these priorities.

1-42 Benefit/Cost Table

17-12 We suggest using the extra space on the page to include more information such as number of head, average of units, dollars expended, and even the overall B/C ratio.

1-46 Top paragraph, last two sentences

17-13 We suggest replacement of these sentences with the following: "An Arizona Game and Fish Department statewide planning study is currently underway. This planning document will provide needed information for the BLM. In addition, many of the plan's components require close coordination with BLM.

2-37 Fourth paragraph

17-14 Evidence presented in this ES does not support the rather nebulous statement regarding the effect of grazing or climate on vegetation. Also, we do not see a direct correlation emerging from the figures in regards to rainfall and vegetation.

2-43 Second paragraph

17-15 The Range Conditions Class map is number 2-6. This paragraph again re-emphasizes the point that the lack of water has prevented overgrazing by livestock and thus forage conditions are better.

2-44 White-tailed Deer

17-16 That this species is "...surviving in heavily grazed areas" (paragraph three) does not give us much information. In paragraph four, we would appreciate knowing which plant species are in competition and whether it is for food, cover or space.

2-47 Rocky Mountain Elk

17-17 We are not sure of your basis for stating that "...competition between elk and livestock on public lands appears to be relatively low." Plant species and competition for other needs should be identified.

2-47 Pronghorn Antelope

17-18 The plant species and other types of competition should be identified.

2-48 Bighorn Sheep

17-19 The identity of the goal - whether AG&FD, BLM, or both - should be stated.

2-47 and 50 Bighorn Sheep

17-20 The competition between bighorns and livestock should be expanded. Bighorn populations would most likely expand dramatically if cattle were not present and range conditons improved.

2-50 through 55

17-21 Overall, your discussion of small mammals, birds, reptiles and amphibians is well done. We would have appreciated more on the results of overgrazing different vegetation types on bird populations. Actual examples would be an aid. A discussion on the desert tortoise and grazing should be included in the reptiles discussion.

2-96 Use problems

17-22 Some of the listed actions appear to be causes and others effects.

2-123 through 125 Tables on Fish and Wildlife Species

These are useful and well done tables which point out the necessity to reduce grazing pressure if wildlife is to keep from declining.

3-17 Table 3-5

17-23 Item number 4 of the key should probably read 25-50 percent of the potential.

3-18 Table 3-5

17-24 There appears to be quite a range of anticipated impacts for some of the species, for example, the pocket mouse. More detail on these species would be appreciated. Under Threatened and Endangered Species, number 25, we would add that the Gila topminnow is found in Aravaipa Creek.

3-22 General, first paragraph

We most certainly agree with this discussion, particularly the last sentence.

3-23 Mule Deer

That mule deer and livestock can exist together is generally agreeded;
17-25 however, it is not that livestock grazing has no effect on deer. We are
not convinced that "grazing can improve conditions for deer."

3-24 Bighorn Sheep

We would hope that a proposed action by an enlightened federal agency
17-26 such as BLM would provide more benefit to a species as important and
interesting as the bighorn. Particularly noteworthy is its classifica-
tion as a Group III mammal in AG&FD Threatened Wildlife listing.

3-27 Grassland nesting birds

17-27 It would not be fair to say that all such birds "are better adapted to
grazed ranges."

3-32 Second paragraph

For the reasons stated in this paragraph, we would recommend that year-
17-28 long grazing be replaced by system that entail moderate use and adequate
rest.

3-67 Table 3-16

17-29 When will the vegetation in the various grazing units be at a stage to
show these anticipated results in livestock?

5-2 and 3

Reviewing table 5-1 and the accompanying explanation, we note that
impact categories one and three of the proposed action would adversely
affect a majority of the wildlife species. To carry out mandates of
multiple use management, we recommend that BLM incorporate the following
17-30 items in your management plans: (1) the carrying capacity be reduced to
below-range productivity, (2) no grazing be allowed on aquatic or riparian
areas, and (3) stocking and other actions be formulated that will provide
sufficient food and cover for pastures in use.

8-11 through 15 Elimination of Grazing

The discussion presented here, together with table 8-1, reveals to us
17-31 that this alternative provides for greater benefits to all other uses of
natural resource lands but grazing. Economics in not providing grazing

17-31 leases does not seem to be a part of the evaluation. Neither is there any accounting given for uses of the natural resource lands other than grazing.

17-32 From the table it would appear that Alternative 4 (50% Grazing Capacity) satisfies multiple use concepts more than the proposed action. One of the major differences between this alternative (number 4) and the proposed action is an additional decrease in ranch values. If the grazing lease fee actually reflected the true value of the lease, the reduction in leases would not reflect on the value of a ranch.

17-33 Hunting, bird watching and a host of related outdoor activities are a viable and expanding use of Arizona's resources. They should receive equal consideration in the management of our public lands.

A-16 Appendix B

17-34 The range trend should be displayed. We note that many areas of high deer use have present range conditions of fair or poor. We would recommend removing grazing from these areas until conditions improve.

A-66 through 68 Appendix K

17-35 We encourage inclusion of the 11 mitigation measures as mandatory items under Chapter 4, mitigation. This evaluation of impacts due to the proposed action is well done and deserves more consideration in the formulation of the proposed action. Concerning bighorn sheep (item number 6) we recommend removing all grazing from their habitat.

Sincerely,

Frank M Baucom

Frank M. Baucom
President-Elect

Response:

17-1 Chapter 1 has been changed to state that "at a given stocking rate during years of high forage production (e.g. above normal rainfall) utilization in the use pasture might be as low as 20 percent. During years of low forage production, utilization could be as high as 60 percent." Although 40 percent utilization is the goal, it would be wrong to assume that each years use in the grazed pasture would be exactly 40 percent. Years of favorable or unfavorable production will account for the variation in utilization. Also see response 12-14.

17-2 See response 12-14.

17-3 We believe the desired improvement will result by stocking at carrying capacity, since by definition carrying capacity is the "maximum stocking rate possible without damage to vegetation or related resources."

Although initially stocking below carrying capacity may have some environmental merit, it would involve serious economic impacts on allottees. The trade-offs have been evaluated in the ES. (See chapter 8, alternative 4.

17-4 See response 12-3.

17-5 See response 13-2.

17-6 See response 12-4.

17-7 See responses 12-7 and 13-6.

17-8 We plan to use the best method predetermined by conditions at the site. Floating covers have presented some practical problems.

17-9 Butyl rubber bags are being phased out because of the problems mentioned.

17-10 The ES (pages 1-24 and 3-13) proposes the development and maintenance of riparian growth.

17-11 Critical watershed and wildlife areas are areas that need prompt, positive action to prevent further degradation of the resource. Two examples of areas thought of as "critical" from a watershed and wildlife viewpoint are the San Simon River Channel (watershed) and the Dos Cabezas Mountains (wildlife). Also see response 13-7.

17-12 The text has been expanded.

17-13 The text has been changed.

17-14 See response 13-11.

17-15 The text has been changed.

17-16 The text has been changed.

17-17 See response 12-11.

17-18 The text has been changed.

17-19 The text has been changed.

17-20 The text has been changed.

17-21 The section in chapters 2 and 3 on small mammals, birds, reptiles, and amphibians describes the impacts of livestock grazing on these wildlife species. Discussion of the desert tortoise was included under Endangered and Threatened Animal Species in chapter 2.

17-22 This paragraph identifies problems that are both causes and effects. They are interrelated impacts on both recreationists and livestock operations.

17-23 The text has been changed.

17-24 The range of overall impacts given in table 3-5 for rodents is based on limited knowledge of population levels within the ES area and a small amount of information on the effects of various levels of livestock grazing and various types of grazing systems on rodent populations. For this reason, and on the basis of available information, providing a narrow range of anticipated impacts would be inappropriate. The range given for pocket mice was a typographical error, however, and has been changed from 1-6 to 1-2.

Table 3-5 has also been changed to include the Gila topminnow as present in Aravaipa Canyon Primitive Area. Also see response 8-2.

17-25 See response 13-16.

17-26 See response 12-11.

17-27 The text has been changed.

17-28 See response 13-18.

17-29 See response 13-19.

17-30 We have evaluated the possibility of stocking below carrying capacity, and it is one of the alternatives to the proposed action.

Fencing livestock out of some of the aquatic and riparian areas is proposed. Fragmented land ownership is one of the reasons for not proposing fencing of other areas.

Again, the goal of 40 percent average utilization and maximum 60 percent utilization should provide sufficient food and cover for wildlife. Also see response 12-6.

17-31 See response 13-21.

17-32 The alternative stocking at 50 percent of grazing capacity would have merit on those grazing units proposed for a rotation system for the initial implementation stages but would impose rather arbitrary reductions on these allottees involved. Allottees with proposed yearlong grazing would not undergo as large a reduction. For example, an allottee with a four-pasture system, using three pastures in any one year, would be allowed to use 50 percent of the AUMs in the three pastures grazed. An allottee with a yearlong system, on the other hand, could use 50 percent of the total AUMs available on the entire grazing unit. This alternative clearly places a penalty on allottees wishing to attempt a rotational grazing system. Also see response 13-21.

17-33 These uses are a viable and expanding use of Arizona's resources. In regards to picnicking, sightseeing, and hiking, our Visual Resources Management Program has and will continue to contribute to our range improvement program and AMP program. Projects that might visually damage the landscape are evaluated and their impacts mitigated.

For hunting and birdwatching, BLM has the responsibility to provide adequate habitat for wildlife species, both game and non-game. The proposed action would fulfill this responsibility.

17-34 Range trend information was not displayed because, as mentioned in chapter 2, this information is not available for the entire ES area.

Range condition is based on the potential climax vegetation community of a range site. Areas in excellent range condition will not, in many cases, be the best habitat for a given species. We certainly will not manage for poor condition but may manage for something less than excellent condition, depending on the resource goals for an area.

17-35 See response 12-19.

ARIZONA SECTION

Society for Range Management Inc.

June 19, 1978

Mr. Robert O. Buffington
State Director
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Bob:

Attached are comments prepared on the Grazing Statement for the Upper Gila-San Simon Area. Dr. S. Clark Martin, Past President of the Arizona Section, Society for Range Management, prepared the comments.

Ivan R. Porter

Ivan R. Porter
President, Arizona Section
Society for Range Management

Comments on

Upper Gila-San Simon Grazing Environmental Statement (draft)

I have enjoyed reviewing the subject EIS for the Arizona Section SRM. To me it seems to be a rather complete and thorough job. I did not attempt to review the entire document but confined my efforts largely to sections dealing with livestock grazing--especially grazing systems.

The EIS area includes many parcels of range that have been in unsatisfactory condition for so long that we no longer know what the potential is. Thousands of acres of former black grama range have been invaded by creosotebush, mesquite, snakeweed, etc. Long-lived perennial grasses are so widely spaced that the number of perennial grasses per unit area can be increased many times before the stand becomes so thick that the grasses compete seriously with each other. This leads me to believe that the EIS area can ultimately support many more cattle than the 15-25 year projection indicate, although the rate of recovery may prove these projections to be correct.

Implementation of the Proposed Action Plan will meet with strong opposition and will be complicated by the crazy-quilt pattern of state, private and BLM ownerships. BLM is under order to revise the downward trend in range condition on Natural Resource Lands. This is a good first step for the Upper Gila-San Simon unit. More specific comments on grazing provisions of the Statement follow.

<u>Grazing Systems</u>

1. Rest Rotation-(4 pasture): This system as diagrammed on pages 1-12 and 1-13 provides rest almost 2/3 of the time which is good but the 20-month (B-C) rest period allows one summer's forage production to go unused. If utilization is
18-1 held to 40% (as a 5-10 year average) I doubt if the benefits of this long rest period outweigh (1) the cost of sacrificing one year's production and (2) the benefits of seed trampling on foraged crop "B".

2. Santa Rita Three-Pasture Rotation: This schedule actually provides 12 months rest before each grazing period.
18-2 Still the year of rest before spring grazing is especially important. This system also uses each year's forage crop.

The diagram on page 1-15 is incorrect: i.e. treatments B and C
should be interchanged. The diagram on page 1-16 is O.K.

3. Two-Pasture Deferred Rotation: This system may well
be more destructive than continuous yearlong grazing unless
stocking is cut in half. If diagrammed on the basis of a
year running December-November the system turns out to be
alternate year rest. One problem is that, if stocking is the
same as if both pastures were grazed yearlong, forage is
removed twice as rapidly as under yearlong grazing. This
means that twice as much old forage is removed during the
18-3 dormant season (November-February) thereby exposing more of
the perennial grass plants to repeated close grazing during
the brief period of spring growth (March-May) when cattle are
especially hungry for fresh green forage. Plants weakened
by close grazing during the spring will not respond vigorously
to summer rainfall. Frankly, I doubt if there is any
two-pasture rotation that is superior to continuous yearlong
grazing at an appropriate level of use.

4. Three-Pasture Deferred Rotation: This system rests the
range 1/3 of the time and rests during both spring and summer
growth periods on one year out of three. It also defers grazing
until March 1 year out of three. These are good features but
18-4 I question whether rest 1 year in three is enough to overcome
the effects of the increased grazing pressure in the other two
years. Again this assumes that total stocking is the same as if
each pasture was stocked properly under yearlong use.

Note: the diagrams on page 1-17 omit the month of May

5. Summer Seasonal Grazing: A good system if utilization
is not excessive.

6. Winter Seasonal Grazing: If this system is intended to
increase production of perennial grasses care should be taken
18-5 to remove cattle in the spring before regrazing of favorite
plants becomes destructive.

7. Winter Seasonal Rotations: Again, watch what happens
in the spring and avoid excessive use of favored perennials
at this time.

8. Ephemeral Grazing Management: O.K.

9. Deferment of Grazing: My only thought is that some
18-6 units may improve faster with intermittent grazing to aid in the
spread and trampling of seed and prevention of plant decadence.

<u>Miscellaneous Comments</u>

1. Page 3-7, paragraph 4. The problem of a possible forage
shortage in the first year of a rotation system can be easied
if the plan is initiated in the fall following a summer of high
forage production.

2. Page 3-13, paragraph 3. The flood plain behind the detention dams will produce large quantities of herbage beginning the first year. It seems to me that some of this herbage could well be
18-7 used to ease the impact of livestock reductions on ranchers who are in a position to utilize this kind of forage to relieve pressure on other parts of the range.

3. Page 5-1, paragraph 2 and 3. I don't agree with the statement on impacts on soil. Yes, the physical improvements
18-8 would have some short-term disturbance effects, but improved vegetation cover over the entire area should provide marked beneficial results in the long run.

4. Chapter 8--Alternative to Proposed Action: I would like to see another alternative, or, it could be supplemental to the "Proposed Action". Substantial reductions in stocking will be required to reverse the downward trend in range conditions on many of the units even though range experts may disagree among themselves about how severe the reductions should be from unit to unit. Thus, I agree that reductions are essential and, since I am not familiar with the tracts involved, I tentatively accept the recommendations in the report. The added feature I would like to see is provision for public funding of range improvement projects (seeding, shrub control, water concentration
18-9 pits, etc.) on a scale sufficient to allow the rancher (at least the full time rancher) to stay in business. Admittedly, the cost-benefit raios of such investments would not look good to an economist but, in the long run, I think benefits to the public would far outweigh the initial cost. Improvement projects would have to be well planned and executed and grazing of the improved area would have to carefully controlled. With these restrictions the improved areas could carry the excess livestock while the rest of the range recovered naturally under lighter stocking and appropriate rest-grazing schedules.

S. Clark Martin

S. CLARK MARTIN
Arizona Section SRM

Response:

18-1 The system will be field tested, and, if adjustments are needed, they will be made. The long rest period may be excessive, and keeping utilization at the 40 percent level may prove difficult without changes in either the system or the livestock stocking rate.

18-2 The text has been changed.

18-3 See response 12-3.

18-4 See response 12-3. (1-17 diagram corrected.)

18-5 The seasonal grazing systems will be studied after implementation and needed changes will be made. Also see response 13-2.

18-6 The deferment of grazing areas were proposed for two reasons: (1) to protect riparian areas and (2) to remove cattle from the badly eroded San Simon River area until structural work can stabilize the watershed. The San Simon, in its present state has a questionable seed source for a trampling treatment to work. Livestock grazing in riparian areas will be closely controlled and may not even be allowed unless good resource enhancement reasons are present.

18-7 The flood plain behind the detention dams might improve faster than anticipated. If so, livestock grazing would be permitted sooner than expected.

18-8 The long-term impacts were estimated by observing the impacts of similar improvements in the ES area. Disturbed areas might improve faster than anticipated, particularly with reduced stocking rates.

18-9 Most of the proposed projects are on public lands and are expected to be funded through range improvement funds returned from grazing fees and through congressional appropriation. Over 80 percent of the needed capital investment for projects is on public land.

Governor
BRUCE E. BABBITT

Commissioners:
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MILTON G. EVANS, Flagstaff
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June 22, 1978

Mr. Robert O. Buffington
Bureau of Land Management
Arizona State Office
2400 Valley Bank Center
Phoenix, Arizona 85073

Re: Upper Gila - San Simon Grazing
Environmental Statement: Draft

Dear Mr. Buffington:

We have received and reviewed the above-referenced draft ES. It is evident that considerable effort has been invested in its preparation and compliments are in order for the wildlife considerations contained. Although we find most of the wildlife impacts to be well thought out and adequately addressed, there are a few points which we believe should receive further consideration or be clarified. The following comments are indexed by the appropriate draft ES page number.

1-6, Para. 1.

19-1 Under the proposed action, 2,128 AUMs would be reserved for "Wildlife", however, these reservations were calculated by considering the needs of only one animal, deer (A-3, para. 2). In that there are approximately 423 additional terrestrial species in the area (2-39, para. 2), this reservation seems hardly adequate to ensure for the needs of all "Wildlife". We realize that accurate estimates of the numbers or requirements of these numerous other species are either not available or are extremely difficult to acquire. This fact, however should not preclude at least a minimal consideration of their food and cover requirements. Reservations for these numerous other species equal to twice that for deer would probably be less than adequate.

Furthermore, approximately 38% of the proposed wildlife allocations occur in allotments proposed for yearlong grazing and, as was well stated (2-43, 3-9, 3-31, 3-32), competition between livestock and wildlife is intensified under yearlong grazing. This would therefore tend to significantly reduce the total benefit to "wildlife" of the 2,128 AUM reservation.

1-6, Para. 2.

We are pleased to see considerations are to be made for the potential future growth of wildlife populations and their needs.

1-9, Para. 5.

19-2 It is not clear as to how an "average" of 40% utilization would be obtained by grazing at a level of 20% utilization in "favorable" years and 60% in "poor" years. As was well stated (2-118, para. 6; 3-11, para. 3), the poor years generally out number the favorable years by more than 3 to 1. In view of this, it would seem that if the 20% minimum utilization level was incurred in good years, then the maximum utilization level for poor years would need to be approximately 45% in order to obtain the desired 40% "average".

1-11

19-3 Are the estimated carrying capacities (AUMs) for individual allotments to be used as the initial licensed use (stocking rate)? If so, it would seem, under both the three-pasture and four-pasture rotation systems, that these "total allotment AUMs" would be taken from only a portion of the allotment (2 or 3 pastures). This would result in overstocking and overutilization. Please explain how this is to be avoided.

1-23

The recognition that much of the public grazing lands in Arizona are "ephemeral ranges" is highly commendable.

1-24

19-4 Under the "Deferment of Grazing" discussion, it is stated that "critical" riparian and aquatic habitats are to be fenced. However, the criteria for determination of "critical habitat" are not given. In view of the extremely limited quantity of this type of habitat in Arizona, the rate at which it is being lost, and its importance to wildlife, all riparian and aquatic areas are probably of "critical" importance.

1-26

19-5 The proposed action requires 121 new earthen reservoirs, 65 water storage tanks, and 17 other water developments such as wells, catchments, and spring developments (Table 1-3). Potential wildlife impacts discussed in association with these water developments are principally limited to consideration of only surface disturbance (3-4, 3-13, 3-40, 5-2, and Table 5-1). The criteria for determining the need for most of these new water developments presumably include the fact that the specific areas are not being

19-5 utilized by livestock to an appreciable degree. It therefore follows that these areas probably constitute some of the better range condition and wildlife habitat (e.g. 2-43, para. 2, last sentence). The introduction of concentrated livestock use into these presently low use areas through the development of new waters will significantly impact the present habitat condition and wildlife species in the area. Areas surrounding livestock waters are frequently referred to as "sacrifice areas" due to concentrated livestock overutilization in the immediate area. This phenomenon was briefly discussed (2-55, 2-56, and 5-1). While it is true that some species of wildlife will use these new waters, the potential impact associated with concentrated livestock use in these areas has not been adequately addressed.

1-28, Para. 1.

19-6 The text states that the bottom strand of an antelope fence is to be 16 inches from the ground whereas figure 1-1 shows this measurement to be 18 inches.

1-34, Para. 1.

19-7 Why are only "yearlong waters" to be fenced? It seems that the same benefits from fencing could be obtained on waters which are not "yearlong".

1-34, Para. 5.

We are pleased to see that efforts will be made to maintain water supplies on pastures when livestock are not present.

1-46, Para. 1.

19-8 The pilot "study" for Wildlife Management Unit 37B was <u>completed</u> almost two years ago. Similar management plans are presently being formulated which will ultimately effect all of the ES area.

2-50

19-9 In the discussion of impacts to small mammals, the statement is made that "certain species increase whereas others decrease" under heavy range use. This is true, however, it should be clarified that the species decreasing are grassland species and the increasing species are scrub species. The net result is a change in species composition. This is most important when one considers that our southwestern grasslands and grassland species have been diminishing for the past century due to overgrazing, fire suppression, and a variety of other factors. The importance of remaining

19-9 populations of grassland species increases as the supporting grasslands continue to diminish. Similar statements could be made regarding all grassland species including birds, mammals, and herptiles.

2-50, Para. 2.

19-10 The assertion that rugged terrain reduces competition between livestock and bighorn sheep ignores the fact that livestock may be excluding bighorn sheep from otherwise inhabitable areas.

2-53, Para. 4.

19-11 The discussion regarding reptiles and amphibians is somewhat misleading in that the reader tends to believe that only a few grassland species of the 73 herptile species will be impacted and these only in the eastern parts of the ES area.

2-55, Item 6.

19-12 Under the Black-bellied tree duck discussion, it is not clear what is meant by "no other occurrence not known".

3-1, Item 4.

19-13 If livestock and wildlife combined will utilize no more than 60% of the available forage in a given pasture, what method is to be used to estimate the additional wildlife utilization after livestock are removed? Removal of livestock when the 60% level is attained would result in a "total" utilization of greater than 60% since wildlife would remain to continue use after the livestock are removed.

3-29, Para. 1.

19-14 The statement that "Montezuma quail------could be greatly disturbed" should be changed to "would be greatly disturbed".

3-36, Para. 2.

19-15 It is stated that the "majority of riparian or riverine areas would be protected by fencing. Two examples of areas to be excluded from protective fencing are given (3-37, para. 4). Are these the only riparian or riverine habitats in the ES area which will be excluded? If not, why are the other areas excluded in view of the dismal future expectations for these areas without protective fencing (5-2, para. 5). Furthermore, in consideration

19-15 of the limited quantity of this habitat (0.1 percent of the ES area), the efforts which will be needed to assure that utilization will not exceed 40 percent, and its extreme aesthetic, recreational, and wildlife value, it is highly questionable that these areas should be grazed even under deferred management (3-36).

3-64

19-16 The proposal to reduce current licensed grazing by 57,209 AUMs (33%) is highly commendable and, we believe, a significant step toward saving our natural resource range lands. However, in consideration of the fact that 90% of the area is presently in either poor or only fair condition (2-28) and that the trend in condition generally appears to be downward (2-36, 2-37), it is questionable that this reduction is adequate to result in the projected range improvement of 12% in 15 years (3-5, para. 4). This is exemplified by the fact that the trend in range conditions has continued to be downward on allotments on which AMPs have been implemented for the past 7 to 9 years (2-32, para.2).

4-1

19-17 Chapter 4 describes some of the potential and desired mitigating measures which should be incorporated in the proposed plan. The measures described, however, seem incomplete. Appendix K contains excellent additional measures which "could" be used. We firmly believe that the mitigating measures presented in Appendix K "should" be used and should be <u>entirely</u> incorporated in chapter 4 as proposed mitigation.

8-3

19-18 Wildlife population levels presented in Tables 8-1, 3-7, and 2-9 appear to be lower than one would expect by comparison of Appendix E with respective acreages of vegetative types presented in Table 2-6. Furthermore, the potential increases in population levels presented in Table 8-1 under alternative 2 do not appear to reflect estimated increases presented in Appendix E. Please explain these apparent discrepancies and the manner in which the numbers in Tables 2-9, 3-7 and 8-1 were generated.

8-9

19-19 The paragraphs dealing with fishing and hunting recreation uses state that there would be no change in use under the no-action alternative. Table 8-1, however, 19-19 shows that wildlife populations would continue to decline under this alternative. This would ultimately result in losses to recreation.

8-22

19-20 It is not clear why the proposed action has been selected over the "50 Percent Grazing Capacity" alternative. This latter alternative appears to have greater potential benefit to almost all resources than the proposed action except for the economic benefits relating to the livestock industry.

8-24, Last Para.

19-21 Contrary to what is stated, increases in carrying capacity of the range could presumably occur at a more rapid rate under the "50 Percent Grazing Capacity" alternative than under the proposed plan.

A-1

19-22 It is stated in item 2 under Methodology Used (A-1) that reductions were made in carrying capacity estimates because of terrain, rockiness, lack of water, or other physical limitations to grazing an area. This is an excellent point since this factor in estimating carrying capacities is often overlooked in range survey work. However, no other reference to this could be found in the draft ES. It is also stated (A-2, para. 6), that 72% of the area has had either no recent forage survey or no survey at all. The methods and criteria used to determine the non-grazable acreage of an allotment due to excessive slope, rockiness, etc. need to be explained. The acreage estimates for non-grazable terrain and the respective reductions in allotment carrying capacities should be included in the ES. With over 10 mountain ranges in the ES area, it would seem that these reductions would be considerable.

We hope that the above comments will be useful to you in the preparation of the Final ES and that the questions raised can be accommodated.

Again, we wish to compliment you on the draft ES.

Sincerely,

Robert A. Jantzen, Director

By: John N. Carr, Supervisor
Planning & Evaluation Branch

JNC:dd

Response:

19-1 See response 12-4 and 12-18.

19-2 Our goal is a 40 percent average utilization. If the utilization does actually amount to 45 percent, on the average, as you state, we will adjust livestock numbers until we do obtain 40 percent average utilization.

19-3 These estimated carrying capacities are to be the initial stocking rates. As you imply, it may be necessary to either adjust livestock numbers before a grazing cycle is completed or to allow use of a rested pasture. See response 12-14.

19-4 See responses 12-6 and 13-7.

19-5 See response 13-6.

19-6 The inconsistency has been corrected.

19-7 The text has been changed.

19-8 The text has been changed.

19-9 The text has been changed.

19-10 See response 13-13.

19-11 The text has been changed.

19-12 The text has been changed.

19-13 See response 12-14.

19-14 In our opinion the text is correct as stated.

19-15 Other areas will be excluded. See responses 12-6, 12-16, and 13-5.

19-16 The trend is down on most grazing units with implemented AMPs not because of the failure of the grazing system but because of the failure to reduce livestock numbers to the proper carrying capacity. We believe that the combination of livestock reductions and the implementation of grazing systems will allow the objectives of the proposed action to be met.

19-17 See response 12-19.

19-18 Direct comparison of these tables is not possible. The future populations shown on tables 3-7 and 8-1 are for a 15-year period. The future populations shown in appendix E are optimum. Also, the density figures given in appendix E cannot be directly compared with total numbers of animals shown in tables 2-9 and 8-1 because acreages for vegetation types in each area (1 through 7, appendix E) have not been computed.

19-19 If wildlife populations decline only to the levels indicated in table 8-1, the quality rating class for fishing and hunting would probably not change, and visitor use would not decline appreciably, considering the relatively small change in actual wildlife numbers projected. The text has been changed to clarify this point.

19-20 We do not understand your term "selected". Neither the proposed action nor any of the alternatives have been "selected" as far as a decision is concerned. See response to hearings comment #22.

19-21 Page 8-24 (8-28 om tje FES) states nothing about the rate of increase in carrying capacity. It only states that the end result is estimated to be about the same. Presumably the rate of increase could be faster under the 50 percent grazing capacity alternative.

19-22 As explained on page A-1, the percent of the transect type area unusable or partially usable is entered on the reverse side of form 4412-1.

For the estimates of carrying capacity (not the ocular reconnaissance survey), form 4412-1 was not used. A team of range specialists estimated the carrying capacity by vegetation subtype. Reductions for terrain features were made in the field and only the Forage Acre Factor (FAF)(see appendix A) was entered on the map. Therefore, acreage estimates of areas totally nongrazeable show up on the estimate maps as areas having a .00 FAF. The reason (e.g. rockiness, slope, no forage) for the designation, however, is not shown.

The method used to make estimates does not allow determining the acreage of areas partially nongrazeable or having a percentage reduction in carrying capacity due to terrain features. The effects of this shortcoming will be rectified by modifying AMP's based on future range inventories, actual use and utilization data, evaluation procedures outlined in chapter 1, information from the mitigative studies in chapter 4 and the flexibility considerations noted in response 12-14.

HISTORIC PRESERVATION PROGRAM
Department of Educational Finance & Cultural Affairs
c/o New Mexico State Library
P.O. Box 1629
Santa Fe, New Mexico 87503
(505) 827-2108

June 19, 1978

Mr. Robert Buffington, State Director
Arizona State Office
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

The Draft Environmental Statement for the Upper Gila-San Simon Grazing Management Program has been reviewed by this office. As you indicated in the Draft, consultation with the State Historic Preservation Officer regarding the eligibility of known cultural resources for nomination to the National Register is to be initiated with this review (page 2-68).

20-1 In order for this office to comment on your determination, it will be necessary for us to obtain more detailed information on cultural resources located on BLM and other lands affected by the Management Program in New Mexico. Information should include detailed locational data, any survey forms completed by archaeologists, and site maps and photographs that may be available. Information on identified effects on these sites should also be included in order that we may comment on this aspect as required by procedures outlined in 36-CFR-800.

Should you have any questions regarding this request do not hesitate to contact this office. We will be looking forward to receiving this information and if there is anything you may wish to have returned after our review, we will be glad to do so.

Sincerely.

Thomas W. Merlan

Thomas W. Merlan
State Historic Preservation Officer

TWM:dg
cc: Michael H. Bureman

Response:

20-1 We will provide the requested information as soon as possible. Additional information on seven sites will be requested from the Las Cruces District, BLM, and New Mexico State University. When received, it will be forwarded to the New Mexico State Historic Preservation Officer.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
3008 Federal Building, Phoenix, Arizona 85025

ARIZONA STATE OFFICE
BU. LAND MANAGEMENT
JUN 26 '78
SD
ASSOC. SD
PCS
RESOURCES
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MGMT SER
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CF
ACTION
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June 23, 1978

Mr. Robert O. Buffington
State Director
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Bob:

Attached are comments for your consideration and use on the Upper Gila-San Simon Grazing Environmental Statement Draft.

Please contact us for clarification or further discussion as needed.

Sincerely,

Thomas G. Rockenbaugh

Thomas G. Rockenbaugh
State Conservationist

Attachment

cc: (w/att.)
Director, Office of Federal Activities, EPA, Washington, D.C. (5 copies)
R. M. Davis, Administrator, SCS, Washington, D.C.
Kenneth L Williams, Director, WTSC, SCS, Portland, Oregon

COMMENTS BY USDA SOIL CONSERVATION SERVICE

ON

BLM UPPER GILA-SAN SIMON GRAZING ES DRAFT

June 1978

1. General

The environmental statement draft is an assembly of information put into a perspective seldom found prior to this effort. Good work with the limited field data available.

2. Page 1-9 (Last paragraph)

Could more flexibility be used in the numbers of livestock grazed--more in the good years and less in the poor years?

21-1 Also, as a result of good management, could the numbers of livestock grazed be further increased during years of favorable climate and decreased during years of unfavorable climate?

3. Page 1-26 (Table 1-3 and following pages)

Range improvements in Table 1-3 is a good display. The description of the following pages may possibly be shortened in the interest of reducing volume.

These practices relate to water storage, fencing and erosion
21-2 control only. Management alone, or with practices shown, will be limited in improving range conditions to those areas where pinyon juniper, mesquite, etc., are well established and competing. We suggest the consideration of accelerating practices such as brush control, reseeding and range tillage, in addition to the proposed program. These practices expedite improvements.

4. Page 1-44 (Second paragraph under the heading)

The paragraph relating to BLM-SCS activites should refer to the
21-3 coordinated planning process. Also, "when requested" should refer to the landuser through NRCD's.

5. Page 2-5

21-4 We suggest the last sentence include "sheet and rill erosion," as well as "gully formation."

6. Pages 2-6 and 2-7

21-5 The abbreviations for the profile textures are confusing. We suggest the use of the abbreviations in the National Soils Handbook (NSH).

7. Pages 2-6 and 2-7

21-6 We suggest that for a general soil map, the percent association be rounded to the nearest 1 percent rather than out to one-tenth percent. Also suggest rounding off the acres to 5 or 10.

8. Pages 2-14 to 2-23 (See paragraphs on range condition)

21-7 Range condition is determined by comparing present vegetation with the potential vegetation of a range site. To show range condition data under the heading of vegetative types (present condition) is confusing. For purposes of clarity, we suggest moving the range condition information from the vegetative type writeup and adding it to the section headed, "Range Condition." We also suggest changing the heading "Range Condition" (page 2-28) to "Range Site and Condition."

9. Page 2-32

21-8 The permanent transect data is good information. Was this data correlated with appropriate range sites so that conclusions can be based on the potential of the range site?

10. Page 2-34 (Chart, upper right)

21-9 Should the high point be something less than 144.3 percent shown? This display of variations in plant cover is very good.

11. Page 3-3 (Table 3-1)

21-10 It seems that an increase in sediment yield on lands under custodial management in Table 3-1 is not consistent with Criteria for Custodial Grazing Management, listed in items 1 through 5, on pages 1-23. This criteria states that condition is "good to excellent, stable or improving, and practices are satisfactory." Also, the Table 3-2, pages 3-8, Custodial Grazing Systems, indicates yearlong grazing, decrease in plant vigor, etc., which is inconsistent with the criteria on pages 1-23.

12. General

21-11 Forage surveys were completed on approximately 31 percent of the land area, using the old inventory method. We assume that these data were expanded to the entire ES area. It is suggested that a more detailed inventory be completed for the allotment before an AMP is completed.

Response:

21-1 See response to hearings comment #3.

21-2 Many years of research in conjunction with the University of Arizona have led to the conclusion that the added range improvement practices mentioned in your comment are not feasible in the ES area. The soil and climatic limitations diminish any expected success with such practices. The Safford District has many seedlings and study areas in the San Simon Valley, and no practices attempted to date have been successful.

21-3 The text has been changed.

21-4 The text has been changed.

21-5 The abbreviations are explained on page 2-7.

21-6 Rather than change the table and inject rounding errors into it, the table will be left as it is.

21-7 We believe the information as depicted is easy to follow and understandable.

21-8 Permanent transect data were not correlated to range sites, because soil survey information was not available at the time. This information will be used as it becomes available during future monitoring.

21-9 The high point should be 44.3, not 144.3. The figure has been changed.

21-10 Custodial units will not be monitored as closely as will the intensive grazing systems.

21-11 See appendix A for the methodology used. The proposed action would be implemented on the basis of the carrying capacities stated in the ES. Future adjustments would be made on the basis of range study results. See response 21-8 above.

22

ARIZONA STATE ASSOCIATION OF 4 WHEEL DRIVE CLUBS

2839 North 49th Place
Phoenix, Arizona 85008
June 23, 1978

Mr. Robert O. Buffington
Arizona State Director (911)
Bureau of Land Management
2400 Valley Bank Center
201 North Central Avenue
Phoenix, Arizona 85073

RE: Upper Gila-San Simon Grazing EIS Draft

Dear Mr. Buffington:

We have reviewed the above referenced EIS Draft. We submit the following comments.

First, we are very surprised to learn that off road vehicle designations have been made. As of May 21, 1978, the Bureau did not have any authority to make such designations. On this date, the Bureau's Departmental Manual Chapter on the implementation of Executive Order 11644, as amended by Executive Order 11989, became effective. This Chapter provides the Bureau with the authority and procedures for the designation of lands as being "open", "closed" or "regulated". This Chapter became effective thirty (30) days after the issuance of the Final ORV EIS.

Therefore, the Bureau's proposed designations were made without any authority, since they were made prior to May 21, 1978.

The Draft states that the proposed designations were made pursuant to the draft ORV regulations. This contention begs the issue because the Bureau admits using proposed criteria and guidelines which at that time had not been adopted and were under considerable study. The draft regulations just became effective,
22-1 and these were amended considerably, in part to take into account last year's amendments to Executive Order 11644.

If the draft ORV regulations were used here, then the Bureau must redo its work in conformance with the final regulations, as amended. The proposed designations must, therefore, be rejected.

The final regulations (and the draft) provide that:

> "Prior to making designations or redesignations, the authorized officer shall consult with interested user groups, Federal, State, county and local agencies, local landowners and other parties in a manner that provides opportunity for the public to express itself and have those views taken into account." 43 CFR 6292.2(a), Fed. Reg., July 27, 1976.

As far as we know, there is no evidence that the required public consultation was either sought or used, rendering the proposed designations invalid, assuming the Bureau had authority to designate.

In the Addendum to the Final ORV EIS, it is stated that:

"The status of the public lands prior to designation in conformance with Executive Order 11644, under the terms of the District Court Order of May 5, 1975, is simply undesignated."

22-1 The Bureau does not have any authority to make ORV designations pursuant to Executive Order 11644, and it did not have it when this Draft EIS was being compiled. Assuming it did, we submit that the absence of public consultation renders the proposed designations invalid, or at best, of tenuous and dubious merit, raising the possibility of legal challenge.

We recommend that the "proposed ORV designations" established in the Draft be deleted; that all such designations be made with public consultation; and, that all such designations be made as soon as the final regulations are implemented.

22-2 Second, the recreational class rating of ORV use within the ES area should be Class A and not Class B. The natural history, cultural, historical and aesthetic values of the area attract recreational ORV users in a significant manner. The Draft describes the depth of these values. It indicates that ORV use is increasing, an obvious fact given the natural attraction of the area. Since the majority of ORV users are sightseers, the appeal of the Upper Gila Basin and the San Simon Valley justify a Class A recreational quality rating for ORV use.

We recommend that ORV use be given a Class A recreational quality rating.

22-3 Third, we object to the classification of ORV use as a "specialized activity". This characterization implies a unique status, with a certain pejorative connotation, which is not justified. The other identified recreational uses within the ES area - hunting, rockhounding, floatboating - are more specialized than ORV use. We deduce that the only fact that makes ORV use a specialized activity is the presence of a motor vehicle. This is a poor excuse, since all the recreational uses within the area require a motor vehicle. The term "specialized activity" is, furthermore, not defined anywhere in the Draft.

We recommend that ORV use not be classified as a "specialized activity", and that this meaningless and superfluous term be discarded.

Page 3
Letter re Upper Gila-San Simon EIS Draft
June 23, 1978

22-4 Fourth, we recommend that current and more reliable data regarding projected primitive recreation use for the ES area be obtained, and that this term be properly defined. Table 2-18, on page 2-96, uses data which is now eleven (11) years old, raising doubts about its reliability.

22-5 Fifth, the Draft should provide more information regarding the proposed outstanding and research natural areas. We cannot tell why or for what reasons ten (10) areas, all of substantial acreage, will be set apart for limited use. The Draft only states that these areas contain riparian habitat, and that they have been damaged by overgrazing. This is insufficient description of the respective values of these areas.

On this point, we find the Cerbat-Black Mountain Grazing EIS Draft exemplary of the required information. There is provided a specific description of the ecological characteristics and values of each proposed natural area (called an environmental area, which we find also more descriptive term).

We recommend that the EIS set forth specific and detailed information - ecological, historical, cultural - regarding the value of each of the proposed natural areas before such a designation is made.

22-6 Six, the Draft does not address the air quality issue. Since air quality is a standard subject in an EIS of this importance, we recommend that the Final EIS address this issue.

22-7 Seven, we are concerned about the safety of the fences to be built. It is stated on page 3-63 that certain fences "would be hazardous to ORV users." If such becomes the case, the legal liabilities of the Bureau could be substantial.

We recommend that all fences be safe for all users, even it means a visual distraction.

We disagree with the very next statement on this page that "the additional miles of fence would not change the present Class B recreation quality rating for ORVs or the present amount of visitor use." This statement is illogical. Fences will reduce, restrict and limit visitor use, including ORV use.

We recommend that this statement be deleted.

22-8 Eight, we recommend that the Glossary's definition of an off road vehicle be amended to conform with the official definition found in Executive Order 11644, as amended.

Page 4
Letter re Upper Gila-San Simon EIS Draft
June 23, 1978

We hope our comments are helpful. We would appreciate if you would keep us advised on this matter.

Sincerely,

George A. Schade, Jr.

George A. Schade, Jr.
Land Use Chairman

GAS/lmh
cc: Mr. Jim Cain
President

Response:

22-1 Presently all public land is undesignated for ORV use, with the exception of designated primitive areas such as Aravaipa Canyon which is closed to ORV use and need not be designated as per Executive Order 11644. The word designation in the text was used to convey the intent of MFP recommendations regarding ORV use.

Appropriate text changes have been made to clarify where needed. Upon publication of final rules and regulations for ORV use, public lands will be designated in compliance with Executive Order 11644.

22-2 The opportunity for ORV use within the ES area was determined according to BLM Mannual 6111. Granted there are probably some smaller areas within the ES area that do have a Class A value for ORV opportunity, but overall we believe the ES area retains a Class B value.

22-3 The text has been changed.

22-4 The footnote identifying the source of data was in error. The correct publication date of the source quoted is 1972. The footnote has been changed.

22-5 We agree with the comment, but the information is not presently available. The resource values of each proposed area will be thoroughly evaluated before a decision is reached regarding the official designation of an area as an Outstanding Natural Area or Research Natural Area.

22-6 See page 3-1, Climate and Air Quality. The minimal impact of the proposed action on air quality does not justify an indepth discussion.

22-7 Fences designed for low visibility will not be placed in known areas of intensive ORV use.

The quality rating would not change, primarily because the structures would be located in areas that receive limited or no ORV use.

22-8 The text has been changed.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Ecological Services
2934 W. Fairmount Avenue
Phoenix, Arizona 85017
June 27, 1978

Memorandum

To: State Director, Bureau of Land Management, Arizona State Office, Phoenix

From: Field Supervisor, Phoenix (ES)

Subject: Review comments on Draft Upper Gila-San Simon Grazing Environmental Statement

We have reviewed the subject statement as requested and have the following comments:

General

Overall the statement is well written and does a good job of discussing the impacts on fish and wildlife.

Specific Comments

23-1 1-37. The detention dams appear to be significant structures, however, relatively few details of the impacts of these features are presented. Information such as amount of flow in the river and amount and types of riparian vegetation present, if any, should be presented. Also, an accurate map or photograph of the construction sites should be included.

23-2 1-42. Explanation of why 43% of the grazing units display a B/C ratio of less than unity and are still proposed should be included.

23-3 2-38. How can intensive management programs be initiated when data on vegetation is lacking? Those areas with insufficient data should be put on rest status until the appropriate range studies are completed.

23-4 4-2. All of the proposed mitigation measures in Table 4-1 should be implemented.

23-5 A-66. Appendix K presents some excellent mitigation measures. All of these measures should be further evaluated with the object of including them in the recommended proposals for mitigation.

cc:
Area Manager, Phoenix

Response:

23-1 Impacts for these structures are discussed under the various resource headings in chapter 3.

The San Simon River is an intermittent stream. Average annual flow is 11,300 acre-feet (see p. 2-11). Riparian vegetation is limited primarily to scattered salt cedar. The proposed detention dams are not designed to impound water but to slow it up so it will encourage the growth of riparian vegetation.

23-2 See response 12-8.

23-3 Although an intensive survey of the vegetation resources has not been conducted on much of the area, estimates of vegetation composition and carrying capacity have been made. We believe these estimates are adequate for initiating intensive management systems.

23-4 If the proposed action is adopted the mitigation measures will be implemented.

23-5 See response 12-19.

June 26, 1978

Bureau of Land Management
Arizona Ste Director
2400 Valley National Bank Center
Phoenix, Arizona 85073

Re: Robert Buffington

Dear Sir:

Referring to your Upper Gila-San Simon Grazing Environmental Statement Draft on page 1-4 I notice you have our total allotment proposed for an Ephemeral Range Classification. This allotment consists of about 105 sections which is 90 percent Federal Range, and has been controlled by one family for over 60 years. The allotment is fenced into four pastures of equal size which makes it a well balanced unit that can be managed efficiently. At this time and for the past ten years an Allotment Management Plan has been in effect.

The allotment lies along the San Simon River Sourtheast of Safford and carries to the top of the Whitlock Mountains on the East. Elevation ranges for 3150 feet at the lower most point to 5350 feet at the highest most point which is Javelina Peak on the South end of the Whitlock Mountains.

We realize there are small portions of this allotmant that may be Ephermeral Range, however we strongly feel that this unit as a whole should not be clasified as a Ephermeral Range. There is no way we can maintain fences and improvements, and supply water on a unit of this size for a "promise of the use of it at x-year for x-number of months."

We are willing to contimue with the current Allotment Management Plan or negotiate a workable plan in the future based on the existing Perennial Range Classification. We have been cooperative in the past by fluctuating our cattle numbers to correspond with our range conditions (as your licence and actual use records will show). By doing this we have shown an improvement in the range over the past few years, including the most recent dry years.

We do not feel you have considered the adverse effects of this classification change, such as reduced revenue, increased depreciation of fences and improvements due to absentee management, absence of water for wild life, increased unemployment, etc.

24-1 Your inspection of this allotment is invited and your help and cooperation in keeping this allotment classified as a Perennial Range would be appreciated.

Sincerely,

Rex C. Ellsworth

Rex C Ellsworth
by Norman Bradley

cc. Guy E. Baier
Safford District Advisory Board

Response:

24-1 We will need to re-evaluate some of the proposed ephemeral classifications and determine, in the cases where portions of a grazing unit are ephemeral and others perennial, whether or not a perennial intensive management system might be more appropriate than an ephemeral designation.

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2711
LOS ANGELES, CALIFORNIA 90053

SPLED-E

ARIZONA STATE OFFICE
BU. LAND MANAGEMENT
JUN 30 '78
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26 June 1978

Bureau of Land Management
Arizona State Director (911)
2400 Valley Bank Center
Phoenix, Arizona 85073

Gentlemen:

This is in response to a letter from your office which requested review and comments on the draft environmental statement for the Upper Gila - San Simon Grazing Management Program, Arizona.

The proposed plan does not conflict with authorized plans of the Corps of Engineers. We have no comments concerning the environmental report for the proposed plan, other than to note that we concur that grazing management is needed to reduce soil erosion, especially in San Simon Valley.

25-1 Construction of the three detention dams cited on page 1-37 of the DEIS will require a Section 404 Permit from the Corps of Engineers as required by Public Law 92-500; this, incidentally, should be noted under "Construction Stipulations," page 1-26.

Should you have any questions regarding requirements for Section 404 permit applications, etc., please feel free to contact Mr. Charles M. Holt, Chief, Navigation Branch, telephone (213) 688-4933.

Thank you for the opportunity to review and comment on this statement.

Sincerely yours,

F. Ce Nishikawa
for NORMAN ARNO
Chief, Engineering Division

Response:

25-1 The text has been changed.

NEW MEXICO STATE CLEARINGHOUSE

REVIEW CERTIFICATION

MIS-5

JUDI ROSS
~~xxxxxxxxx~~
State Planning Officer

STATE PLANNING OFFICE
505 Don Gaspar, Greer Building
Santa Fe, New Mexico 87503
(505) 827-2073

Jerry Apodaca
Governor

TO: Department of the Interior
2400 Valley Bank Center
Phoenix, Arizona 85073

Att: L. C. Buffington

DATE: June 26, 1978

SUBJECT: Review of SAI No.: 8 05 11 153

REVIEW ACTION ON: __ Pre-application X Final Application __ State/Area Plan X EIS	PROJECT TITLE: Upper Gila San Simon Grazing Environmental Statement Applicant: Department of the Interior
TYPE FUNDS: __ Grant __ Loan __ State Block __ State Appropriation __ State Funds Only	SOURCE OF FUNDS REQUESTED Federal Agency: Dept. of the Interior Federal Program Title: Grazing Privileges Federal Catalog No.: 15206 State Agency: Funds Requested: $ N/A Federal $ ______ State

REVIEW RESULTS

KW X The Application is supported.
__ The Application is not in conflict with State, Areawide, or Local plans.
__ Comments are attached for submission with this application.
__ The Application has no review requirements. Thank you, however, for providing this courtesy information.

You may now submit your Application package, MIS-5 and all review comments to the Federal or State Agency(s) from whom action is being requested.

Please notify the State Clearinghouse of any changes in this project. Refer to the SAI number on ALL correspondence pertaining to this project.

WG
DDC

Anita Ossenberg, for
~~xxxxxxxxx~~, *State Planning Officer*
JUDI ROSS

APPENDIXES

APPENDIX A
METHODOLOGIES

Appendix A consists of the following set of methodologies used by the Safford District for gathering data and assessing impacts on various resources in the ES area:

- Determining the Carrying Capacity for Grazing Animals
- Determining the Forage Allocation for Wildlife
- Determining the Forage Allocation for Watershed and Other Nonconsumptive Uses
- Determining Present Sediment Yield and Erosion Condition
- Determining Range Condition
- Determining Future Range Condition
- Determining Future Sediment Yield
- Determining Future Erosion Condition Classes
- Determining Future Carrying Capacity
- Cultural Resources Data Collection
- Cultural Resources Impact Evaluation

Methodology Used for Determining the Carrying Capacity for Grazing Animals

The methodology used to determine the present carrying capacity and future forage allocations for grazing animals includes both the ocular reconnaissance forage survey and estimates.

The ocular reconnaissance forage survey involves the following steps:

(1) Vegetation types and subtypes are delineated on base maps, usually at a scale of 1:63,360 (1 inch = 1 mile) with the use of aerial photographs and field work.

(2) The following data are collected for each vegetation subtype: plant species present, plant species composition and density, and any reductions in forage allocations needed because of terrain, rockiness, lack of water, or other physical limitations to grazing an area. (See attached form 4412-1.)

In gathering these data, a range conservationist checks a delineated unit and selects an area in the unit (vegetation subtype) that appears to be representative of the unit. He then collects the needed data by the step-point method. He paces off a transect for 100 points along a predetermined transect line. At each of the 100 points he makes a reading, recording "hits" or the vegetation encountered by a notch 1/8 of an inch wide on the toe of his boot. Each point represents 1 percent. At the end of the pace transect he tabulates the vegetation "hits." Since each of the 100 points is recorded, the number of "hits" on each species is that species' percent composition in the delineated area. Each step point or pace transect is roughly 1/2 to 3/4 of a mile long. The range conservationist usually takes five paces between readings to give a transect that will reflect the plant composition and density of a given area.

(3) After plant composition and density are recorded, the Proper Use Factor (PUF) for each usable forage plant is multiplied by its percent composition. A PUF represents the average weight percentage of a particular plant species in relation to all other species that can be safely grazed without restricting forage capacity production.

(4) A Forage Acre Requirement (FAR) for the area is then determined. A FAR is that part of a forage acre necessary to support one animal unit for 1 month. A forage acre is the number of acres in a specific area completely covered with totally usable forage.

The FAR for the Safford District was calculated from actual use data collected on a 21,299-acre pasture containing 1,033.4 forage acres and stocked at 1,550 AUMs. The FAR was calculated according to the formula A/B = C, where A = number of forage acres (1,033.4); B = cow months of use (1,550); and C = Forage Acre Requirement (66).

(5) The following calculations are performed on each vegetation subtype as shown on form 4412-1:

1. PUF Percent Composition = Average PUF
2. Total Average PUFs (0.141) x Average Density (0.10) = Forage Acre Factor (.0141)
3. Forage Acre Factor (.0141) x Percent of Area Utilizable (100) = Net Forage Acre Factor (.0141)
4. Forage Acre Requirement (.66) - Net Forage Acre Factor (.0141) = Acres/AUM (46.8)
5. Vegetation Subtype Area (1,390 acres) - Acres/AUM (46.8) = Total AUMs for Vegetation Subtype (29.7 AUMs)

(6) The total AUMs for each vegetation subtype within each pasture on a grazing unit are then summed to determine the total AUMs for the grazing unit.

This ocular reconnaissance forage survey method was used to determine tht total forage allocation for grazing animals on the 28 percent of the ES area that had existing forage surveys completed between 1964 and 1976. The remaining 72 percent of the ES area either had no forage survey information or the existing information came from 1936 and 1964 data. On this area range specialists went to each grazing unit and estimated the total AUMs available for grazing animals based on (1) previous forage surveys in the ES area, (2) comparisons of similar vegetation types and plant densities, and (3) professional judgment.

Determination of the Forage Allocation for Wildlife

In 1976 BLM contracted with the Arizona Game and Fish Department (AG&FD) to develop wildlife population estimates to be used in the Upper Gila-San Simon ES. These estimates were based on a five-digit level of Brown and Lowe's (1974a) vegetation communities classification. Maps provided by AG&FD were superimposed on BLM grazing unit maps and the estimated number of AUMs needed for the existing deer were subtracted from the total AUMs in a grazing unit to give the total AUMs available for livestock use. Deer were the only wildlife species allotted a forage reservation.

Determination of the Forage Allocation for Watershed and Other Nonconsumptive Uses

No specific number of AUMs was reserved for nonconsumptive uses. The limits imposed by the proposed action on forage use (a maximum of 60 percent of the current year's growth) is believed to provide adequate watershed protection and to provide for nonconsumptive uses.

Determination of Present Sediment Yield and Present Erosion Condition

Data to determine sediment yield and soil erosion condition classes were taken from BLM's Phase I Watershed Conservation and Development Inventory (WC&DI) conducted from 1971 to 1973.

Range specialists delineated areas on 1:63,360-scale base maps, using much the same criteria as the ocular reconnaissance range survey but considering additional factors such as critical soil erosion areas and slope changes. They then used a step-point or pace transect of 100 points. They took a reading at each point so that each point represented 1 percent. The following data were collected at each point location: the type of ground cover (litter, bare ground, large or small rocks), vegetation composition by species, effective root depth, and present slope (form 7330-12) These data were then used to predict the present sediment yield by a method developed by the BLM Denver Service Center from the Pacific Southwest Inter-Agency committee (PSAIC, 1968) method.

Phase I WC&DI data for surface geology, soil texture, climate, runoff, topography (percent slope), ground cover, upland erosion, and channel erosion were used with nomographs produced by the Denver Service Center to approximate data needed for the PSAIC method. Data on utilization of ground cover were also needed, but since Phase I WC&DI did not provide this information, it was estimated on a pasture-by-pasture basis for each grazing unit.

The combination of the above factors resulted in a sediment yield rating factor, which was used with nomograph #1 to estimate sediment yield.

Included with the Phase I WC&DI data is a rating system used to determine the present erosion condition of an area. Each area was evaluated according to the standards outlined on form 731012, Determination of Erosion Condition Class. The soil surface factor (SSF) rating is based on a 0 to 100 scale. Each criterion listed on from 7310-12 was allotted points, from 0 to a maximum of 15, according to erosion conditions. The points given to each criterion were then totaled and an erosion condition class assigned. The following classes are used:

Erosion Condition Class	Points from Form 7310-12
Stable	0-20
Slight	21-40
Moderate	41-60
Critical	61-80
Severe	81-100

Each delineated area was tabulated by condition class for each grazing unit.

Range Condition Determination Methodology

At the time of the writing of this ES the ES area lacked range condition data obtained by a single method. Some grazing units had range condition information collected using the Parker three-step method, the Deming two-phase method, and the 1975 Range Condition Rating System. Comparisons of previous ratings of a grazing unit revealed that, in many cases, one method would rate a grazing unit in good conditions, another would rate the same grazing unit in poor condition, and the third method would rate the same unit differently from either of the other two methods.

The Safford District estimated range condition of the entire ES area using available information and professional judgment, according to the Soil Conservation Service range site concept (USDA, SCS, 1976). Range specialists overlaid a 1:250,000-scale base map with a general soils map (map 2-2) and a general vegetation map (map 2-3) and used SCS range site guides to draw a range site association map (map 2-5). They then superimposed the range site association map on the grazing unit map (map 1-3) and used the range site guides and BLM staff members' on-the-ground knowledge to compile a range condition map. They then superimposed the range condition map on the grazing unit map and measured acreages of each range condition class in each grazing unit. These results were combined to produce portions of the following maps, tables, and appendix: maps 2-5 and 2-6, tables 2-6, 2-8, and 3-3, and appendix B.

The SCS range site methodology is briefly outlined below. This method was used to establish range sites for the ES area. The method used by the Safford District differs from the SCS methodology in that the District conducted no field work to check the estimates.

A guide for rating range condition is required for each range site. The guide lists the common species in the climax plant community for the site and the amount of each species considered characteristic for the site. The amount of each species is expressed in pounds per acre (air dry weight) or as a percentage of the total production of the plant community.

The range condition of the areas within a range site is determined by comparing the present plant community with that of the climax plant community, as indicated by the range condition guide for that site.

The amount of all climax species not in excess of that shown on the guide is totalled to indicate the relative ecological rating or numerical evaluation of the stand. The rating will be 0 to 100, depending on how closely the plant community resembles the climax plant community for the range site.

Four classes are used to express the degree to which the composition of the present plant community reflects that of the climax community:

Range Condition Class	Percent of Present Plant Community That is Climax for the Range Site
Excellent	76-100
Good	51- 75
Fair	26- 50
Poor	0- 25

Methodology for Determining Future Range Condition

Safford District range specialists familiar with the grazing units evaluated the present range condition for each grazing unit and estimated the range condition changes expected under the proposed action and under each alternative. In addition, range specialists manipulated existing data and studied literature from experiments on the Santa Rita Experimental Range to estimate changes expected for each grazing system.

Methodology for Determining Future Sediment Yield

Soil specialists calculated changes expected in sediment yield under the proposed action and the alternatives, the estimated future difference in utilization of vegetation and future soil surface factors (SSFs) being the only variables. Specialists familiar with the area then estimated the expected differences in utilization of vegetation. Future SSFs were estimated in the field at the time the Phase I WC&DI data were collected.

Methodology for Determining Future Erosion Condition Classes

The erosion condition classes expected in the future were estimated from Phase I WC&DI data. Each WC&DI transect in the ES area was evaluated in the field, and an estimate was made of the future erosion condition class with and without management. The area each transect represented was tabulated to give the expected changes in erosion condition classes.

Methodology for Determining Future Carrying Capacity

At the time each AMP was written, BLM personnel estimated the livestock carrying capacity of the grazing unit expected 15 years after implementation of the AMP. These estimates were based on knowledge of the area, type of management system, and professional judgment. Areas not included in an AMP were estimated by BLM personnel familiar with the area.

Form 4412–1
(November 1970)

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORAGE SURVEY TYPE WRITEUP
(OCULAR RECONNAISSANCE METHOD)

Writeup No. 481301

Date Nov/14/74

Aerial Photo No.

Examiner Humprhey, Rietz	KIND OF GRAZING ANIMAL *	SEASON OF USE	SECTIONS	TWP.	RGE.	MER.
Type Saltbush (13)	cattle	yearlong	28	10S	28E	G&SRB
Ac/AUM						

	SPECIES	TOTAL ALLOWABLE PUF	% COMPOSITION	CATTLE PUF	COMP. X C PUF	SHEEP PUF	COMP. X S PUF	DEER PUF	COMP. X D PUF	PUF	COMP. X ___ PUF
GRASSES	Spcr	50	trace	50	--						
	Himu	40	trace	40	--						
	SUBTOTAL		--								
FORBS											
	SUBTOTAL										
SHRUBS	Opun sp.	--	Trace	--	--						
	Yuel	5	2	5	.001						
	Guly	--	Trace	--	--						
	Atca	50	8	50	.040						
	Prju	20	10	20	.020						
	Lyex	--	Trace	--	--						
	Atpo	10	80	10	.080						
	SUBTOTAL		100								
	TOTALS		100		0.141						

Av C PUF .141 × Av Den .10 = FAF .0141 × 100 % Util = Net FAF .0141 ; FAR .66 ÷ Net FAF .0141 = 46.8 Ac/AUM

Av S PUF ____ × Av Den ____ = FAF ____ × ____ % Util = Net FAF ____ ; FAR ____ ÷ Net FAF ____ = ____ Ac/AUM

Av D PUF ____ × Av Den ____ = FAF ____ × ____ % Util = Net FAF ____ ; FAR ____ ÷ Net FAF ____ = ____ Ac/AUM

Av PUF ____ × Av Den ____ = FAF ____ × ____ % Util = Net FAF ____ ; FAR ____ ÷ Net FAF ____ = ____ Ac/AUM

Total Net FAF ____ ; FAR ____ ÷ Net FAF ____ = ____ Ac/AUM

*Livestock and major game species. *(Other game species making inappreciable use are:*

Form 4412-1 (Cont.)

UTILIZATION DEDUCTIONS IN PERCENT					
USE CRITERIA	CATTLE	SHEEP	DEER		
Slope					
Rocks or Stones					
Timber					
Lack of Water					
Unstable Soils					
Erosion					
Rodents					
Insects					
Other *(specify):*					
TOTAL DEDUCTION	0				
PERCENT UTILIZABLE	100				

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Sheet of

By

WATERSHED CONSERVATION AND DEVELOPMENT FIELD DATA
PHASE I

1. Transaction Code (1) ☐ Correction ☐ Delete	2. State (2–3)	3. District (4–5)	4. Watershed Area (WA) (6–8)

SECTION I – GENERAL WATERSHED AREA DESCRIPTION (FORMAT B)

5. County (10–12)	6. Sub-basin (13–14)	7. Total Acres (15–20)	8. Name of Watershed Area (21–40)

9. Annual precipitation *(inches)* (41–43)	10. Month of peak flow (44–45)	11. Date of survey *(month and year)* (46–49)

12. Is there flood and sediment damage to manmade facilities?
    a. Present *(If damages equal more than $100 annually insert Y, if not N)* ☐ (50)
    b. Future *(with urban expansion or other development:)* Y or N ☐ (51)
13. Does it originate within the Watershed area? Y, N, or Partly ☐ (52)
    (If "no" or "partly," what primary areas? ST, DI, WA) (Format D 10–58) – –, – –, – – –
    – –, – –, – – – – –, – –, – – – – –, – –, – – –
    – –, – –, – – – – –, – –, – – – – –, – –, – – –
    – *(number of Watershed given)* (53)
14. What is presently flooded? ☐ Agriculture (54) ☐ Urban (55) ☐ Public (56) ☐ Industrial (57)
15. Is there an opportunity to reduce the damage? Y or N ☐ (58)
16. Are there water quality problems? Y or N ☐ (59)
17. Does it originate within the Watershed area? Y, N, or P ☐ (60)
    (If "no" or "partly," what primary areas? ST, DI, WA) (Format F 10–58) – –, – –, – – –
    – –, – –, – – – – –, – –, – – – – –, – –, – – –
    – –, – –, – – – – –, – –, – – – – –, – –, – – –
    – *(number of Watershed given)* (61)
18. For what use and intensity is it a problem? *(High, Medium, Low)*
    ☐ Domestic (62) ☐ Livestock (65)
    ☐ Fish & Wildlife (63) ☐ Recreation (66)
    ☐ Industrial (64) ☐ (67) – (Format H 10–29)
19. What is the probable source(s) of the problem?
    ☐ Chemical treatment (68) ☐ Mineral exploration (72) ☐ Other recreation (76)
    ☐ Construction practices (69) ☐ Mineral extraction (73) ☐ Timber harvesting practices (77)
    ☐ Forage utilization practices (70) ☐ Natural situation (74) ☐ Public purposes (78)
    ☐ Gully erosion (71) ☐ Off-road vehicular use (75) ☐ Private land use (79)
    ☐ (80) – (Format J 10–29)

SECTION II – VEGETAL SUBTYPE AND WATER YIELD DATA (FORMAT L)

(10–11)	(12–14)	(18–19)	ACRES		(32–33)	WATER MANAGEMENT IMPROVEMENT					
			(20–25)	(26–31)		INCREASED USABLE WATER			TREATMENT CLASS		
						(34–39)	(40–44)	(45–47)	(48)	(49)	(50)
P. U.	VEGETAL SUBTYPE	PRODUCTIVE CAPACITY *(lbs. 100's)*	BLM	OTHER	NUMBER OF TRANSECTS	POTENTIAL ACRES	ACRE FEET	DOLLARS PER AC FT	MANAGE-MENT	CHEMICAL	MECHANICAL
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
– –	– – –	– –	– – – – – –	– – – – – –	– –	– – – – – –	– – – – –	– – –	–	–	–

(For Instructions see Form 7330–12)

Form 7330–12 (March 1973)

SECTION III – TRANSECT DATA (FORMAT N)

LINE	TRANSECT IDENTIFICATION: (a) PLANNING UNIT (10–11)	(b) VEGETAL SUBTYPE (12–14)	(c) EXPOSURE (15)	(d) NUMBER (16–17)	(e) PERCENT OF VEGETAL SUBTYPE (18–19)	PERCENT OF GROUND COVER: (f) VEGETATION (20–21)	(g) LITTER (22–23)	(h) SMALL ROCK (24–25)	(i) LARGE ROCK (26–27)	(j) BARE GROUND (28–29)	(k) EFFECTIVE ROOT DEPTH (30–31)	SOIL TEXTURE: (l) ¼"–4" (32)	(m) 4"+ (33)	(n) PERCENT OF SLOPE (34–35)	SOIL SURFACE FACTOR: (o) PRESENT (36–37)	(p) WITHOUT MANAGEMENT CHANGE (38–39)	(q) LAND USE MANAGEMENT CHANGE (40–41)	(r) WITH ADDITIONAL TREATMENTS (42–43)	TREATMENTS: VEGETAL MANIPULATION: (s) CHEMICAL (44)	(t) MECHANICAL (45)	(u) WATERSHED TILLAGE (46)	(v) WATER CONTROL (47)
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						
16																						

☆ U.S. Government Printing Office: 1973–784–[illegible] Region 8

Form 7310–12
(May 1973)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

DETERMINATION OF EROSION CONDITION CLASS

SOIL SURFACE FACTORS (SSF)

By	Date
Location	
Treatment affecting the SSF	

SOIL MOVEMENT*	No visual evidence of movement 0 1 2 3	Some movement of soil particles 4 5	Moderate movement of soil is visible and recent. Slight terracing generally less than 1" in height. 6 7 8	Occurs with each event. Soil and debris deposited against minor obstructions. 9 10 11	Subsoil exposed over much of area, may have embryonic dunes and wind scoured depressions 12 13 14
SURFACE LITTER*	Accumulating in place 0 1 2 3	May show slight movement 4 5 6	Moderate movement is apparent, deposited against obstacles 7 8	Extreme movement apparent, large and numerous deposits against obstacles 9 10 11	Very little remaining *(use care on low productive sites)* 12 13 14
SURFACE ROCK*	If present, the distribution of fragments show no movement caused by wind or water 0 1 2	If present, coarse fragments have a truncated appearance or spotty distribution caused by wind or water 3 4 5	If present, fragments have a poorly developed distribution pattern caused by wind or water 6 7 8	If present, surface rock or fragments exhibit same movement and accumulation of smaller fragments behind obstacles 9 10 11	If present, surface rock or fragments are dissected by rills and gullies or are already washed away 12 13 14
PEDESTALLING*	No visual evidence of pedestalling 0 1 2 3	Slight pedestalling, in flow patterns 4 5 6	Small rock and plant pedestals occurring in flow patterns 7 8 9	Rocks and plants on pedestals generally evident, plant roots exposed 10 11	Most rocks and plants pedestalled and roots exposed 12 13 14
FLOW PATTERNS*	No visual evidence of flow patterns 0 1 2 3	Deposition of particles may be in evidence 4 5 6	Well defined, small, and few with intermittent deposits 7 8 9	Flow patterns contain silt and sand deposits and alluvial fans 10 11 12	Flow patterns are numerous and readily noticeable. May have large barren fan deposits. 13 14 15
RILLS	No visual evidence of rills 0 1 2 3	Some rills in evidence at infrequent intervals over 10' 4 5 6	Rills ½" to 6" deep occur in exposed places at approximately 10' intervals 7 8 9	Rills ½" to 6" deep occur in exposed area at intervals of 5 to 10' 10 11 12	May be present at 3" to 6" deep at intervals less than 5' 13 14
GULLIES	May be present in stable condition. Vegetation on channel bed and side slopes 0 1 2 3	A few gullies in evidence which show little bed or slope erosion. Some vegetation is present on slopes. 4 5 6	Gullies are well developed with active erosion along less than 10% of their length. Some vegetation may be present. 7 8 9	Gullies are numerous and well developed with active erosion along 10 to 50% of their lengths or a few well developed gullies with active erosion along more than 50% of their length 10 11 12	Sharply incised gullies cover most of the area and over 50% are actively eroding 13 14 15

SITUATION	TOTAL				

Erosion Condition Classes: Stable 0–20; Slight 21–40; Moderate 41–60; Critical 61–80; Severe 81–100

(Instructions on reverse)

EXAMPLES

ITEM	EXAMPLE ONE			EXAMPLE TWO**			EXAMPLE THREE***		
	POTENTIALLY PRESENT	IDENTIFIED FACTORS	POSSIBLE FACTOR	POTENTIALLY PRESENT	IDENTIFIED FACTORS	POSSIBLE FACTOR	POTENTIALLY PRESENT	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Yes	8	14	Yes	8	14	Yes	8	14
Surface Litter	Yes	9	14	Yes	9	14	Yes	9	14
Surface Rock	Yes	7	14	No	–	– –	No	–	– –
Pedestalling	Yes	10	14	Yes	10	14	Yes	10	14
Rills	Yes	8	14	Yes	8	14	No	–	– –
Flow Patterns	Yes	10	15	Yes	10	15	Yes	10	15
Gullies	Yes	6	15	No	–	– –	No	–	– –
TOTAL		58	100		45	71		37	57
Total SSF	$\frac{58}{100} \times 100 = 58$			$\frac{45}{71} \times 100 = 63$			$\frac{37}{57} \times 100 = 65$		

GENERAL INSTRUCTIONS

District prepares one (1) copy and files in district with particular study under consideration.

Do *not* include items in computations which are not potentially present.

Identify numerical factor that most nearly describes the conditions observed by circling the factor given for each logical item.

**Wind and water are considered eroding agents when evaluating item*
***A soil with no rocks in its profile and no probability of gullying*
****A pumice soil area where no water erosion occurs*

SPECIFIC INSTRUCTIONS

Total all factors at bottom of page. Divide total identified factors by total possible factors for items considered and multiply by 100 in order to compute the SSF.

Situation – Describe situations being evaluated such as present, geologic, with mechanical treatment in effect for 10 years, under a 5 pasture livestock management system for last 8 years, etc.

Total – Total computed SSF.

GPC 850-338

Methodology of Cultural Resources Data Collection

The procedure followed in collecting the cultural resource data consisted of the following processes:

1. A literature search of archaeological, historical, and ethnographic literature;
2. Use of district records, including Unit Resource Analyses (URAs), Management Framework Plans (MFPs), cultural site inventory forms, and planning unit records search inventories and overview statements prepared by the Arizona State Museum.
3. Use of information obtained from professional and amateur groups and individuals, including data received from the Arizona and New Mexico State Historic Preservation Officers.
4. BLM reconnaissance surveys of each grazing unit.

Past archaeological and historical research in the ES area dates back at least 80 years. Both amateurs and professionals showed interest in southwestern Arizona and all regions of the ES area. A complete listing of projects is on file in the Safford District Office.

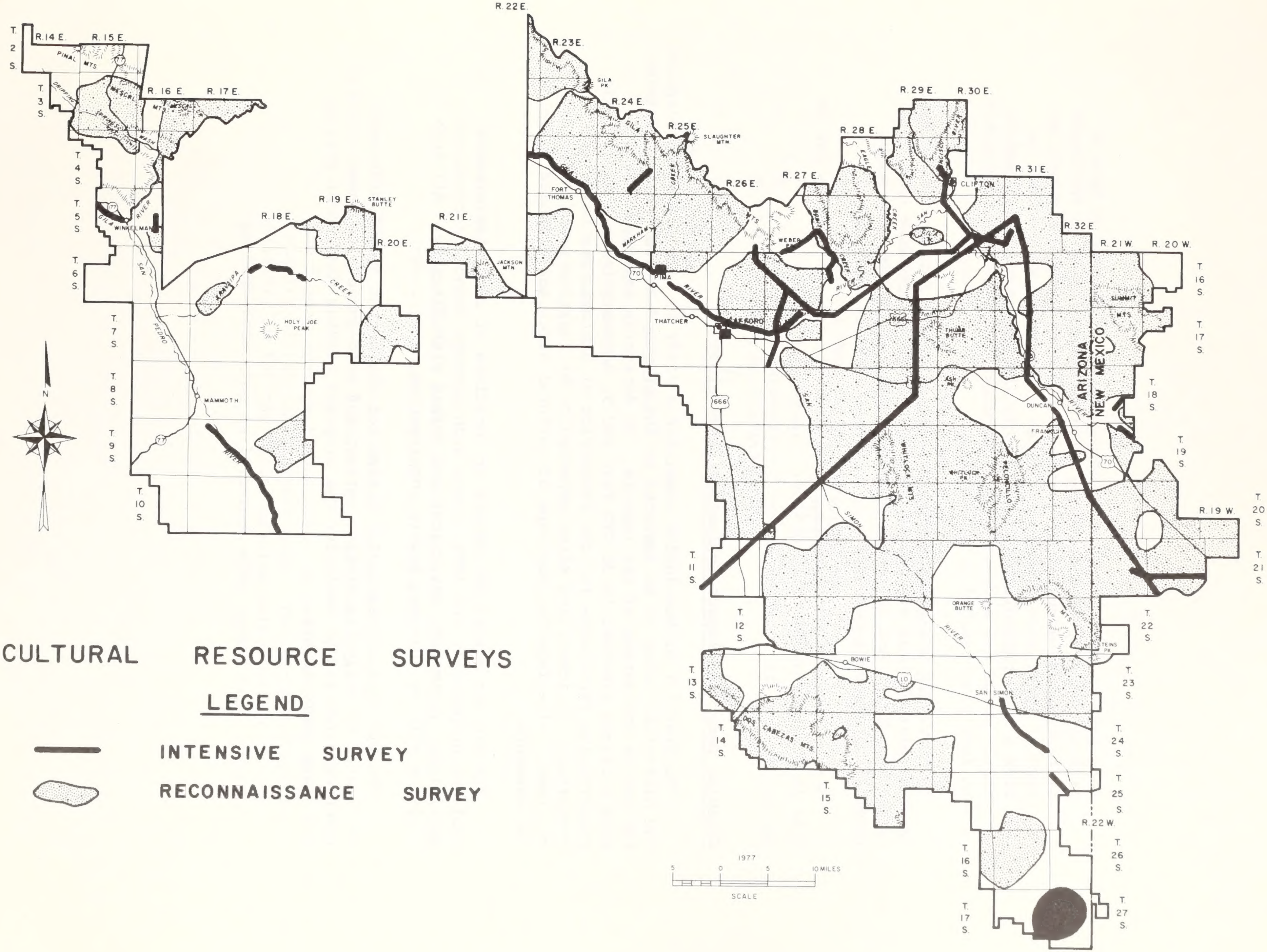
All surveys of one mile in length and greater are shown on the Cultural Resources Surveys Map.

Since the amount of research conducted before the decision to prepare this ES was relatively extensive, methodological procedures No. 1-3 listed previously provided an adequate inventory of cultural sites.

The settlement pattern data available on known sites and the existing information on the general environment of each allotment (topography, vegetation, hydrology, and geographic location) were used to formulate hypotheses on the predicted site density and distribution within each allotment. Grazing unit surveys were then conducted to test the settlement pattern hypotheses.

The methodology for Procedure No. 4 follows:

- The topography, vegetation, hydrology, and geographic location of each grazing allotment were determined using existing URA data, maps, and existing allotment files.
- Information on historic events and processes in and near each allotment was also gathered from existing records and literature to provide a background for the occurrence of historical resources in the allotment.
- Known cultural sites were then plotted on grazing unit maps and their specific environmental setting noted.
- Informal hypotheses were formulated, which stated the areas where sites were most likely to occur.



CULTURAL RESOURCE SURVEYS

LEGEND

INTENSIVE SURVEY

RECONNAISSANCE SURVEY

- Each grazing unit was then driven, and areas believed to have a high probability of containing cultural sites (based on the above criteria) were surveyed on foot. To rid this nonrandom sample of some of its inherent bias, the types of terrain believed not to have a high probability of containing sites were also surveyed on foot. Areas not accessible by four-wheel drive vehicle or quickly on foot were reached by helicopter.

In surveying the grazing unit and recording new sites, the District archaeologist checked previously recorded sites to determine their present condition and to gather more detailed information than might originally have been recorded.

Survey reports, photographs, maps, and site inventory forms are on file in the Safford District office.

Cultural Resources Impact Evaluation Methodology

The District archaeologist completed a study to identify archaeological and historical sites to be impacted by the proposed action and to determine the nature and extent of the impacts. To determine adverse impacts he used criteria provided in 36 CFR Part 800.9, Advisory Council on Historic Preservation Procedures for the Protection of Historic and Cultural Properties. He identified sites expected to be impacted using AMPs, data on present site impacts, and maps of cultural sites and proposed range improvements.

BLM did not survey the routes or locations of range improvement projects proposed in the AMPs, since such surveys cannot be conducted until final routes are determined and marked with flagging. All such projects will be surveyed before construction.

The District archaeologist determined the degree and significance of impacts by analyzing similar current and past impacts to known cultural resource sites and by analyzing the proposed grazing management systems and range improvements.

APPENDIX B
GRAZING UNIT SUMMARY

Legend for those columns that are not self-explanatory

Type of Management:

A	Intensive Management - Implemented AMP
B	Intensive Management - Proposed AMP
C	Intensive Management - Implemented Coordinated AMP
D	Ephemeral Management - Classified Ephemeral Range
E	Ephemeral Management - Proposed for Ephemeral Range Classification
F	Custodial Management
G	Intensive Management - Proposed Revision of Implemented AMP
H	Grazing Use Unallocated

Grazing System:

DR - Deferred Rotation
E - Ephemeral
RR - Rest Rotation
S - Seasonal
SR - Santa Rita
YL - Yearlong

Footnotes:

1. These AUMs are based on the licensed use of only the public lands within the grazing unit boundary.

2. These AUMs are based on the estimated grazing capacity of only the public lands within the grazing unit.

3. The 5-year average licensed use is based on the grazing capacity of the public lands only. The estimated grazing capacity is for the entire grazing unit; therefore, the percent reduction in livestock AUMs cannot be calculated.

APPENDIX B
GRAZING UNIT SUMMARY

No.	Grazing Unit Name	Land Status (Acres) Public Lands	Other	Total	1972-76 Avg. Lic. Use AUMs	Estimated Grazing Capacity AUMs	Wildlife Alloc. AUMs	Livestock Reduction from Avg. Lic. Use %	Type of Mgmt.	Grazing System	Range Condition Class Excel.	Good	Fair	Poor	Erosion Condition Class High	Moderate	Low	Est. Grzng. Cap/15 yrs. (AUMs) under Proposed Management
1	Metcalf	4,404	14,852	19,256	300 1/	300 2/	---	0	F	YL	14,240	---	5,016	---	---	---	19,256	300
2	San Francisco	3,925	1,870	5,795	1,243	399	15	69	B	YL	2,400	---	3,395	---	---	---	5,795	440
3	Slash Hook	6,208	23,525	29,733	4,032	4,092	19	0	C	S, DR	5,280	---	24,453	---	---	1,280	28,453	4,442
4	Hickey	810	525	1,335	270	147	3	47	C	S	---	---	1,335	---	---	---	1,335	165
5	Limestone Canyon	3,050	5,010	8,060	814	609	9	26	B	YL	---	---	8,060	---	---	---	8,060	680
6	Willcross	2,424	8,332	10,756	1,268	1,263	8	1	B	YL	---	---	10,756	---	---	---	10,756	1,405
7	Gila	22,347	9,319	31,666	3,370	3,893	66	0	A	DR	---	2,240	27,346	2,080	---	12,160	19,506	4,150
8	Clifton	1,710	13,725	15,435	1,464	1,047	3	29	B	SR	---	---	8,395	7,040	---	---	15,435	1,203
9	Airport	4,032	14,971	19,003	2,400	2,421	9	0	B	SR	---	---	18,523	480	---	7,360	11,643	2,520
10	Threeway	490	70	560	48	Ephemeral	---	---	E	E	---	---	60	500	---	60	500	Ephemeral
11	Lebar	400	5,280	5,680	22 1/	22 2/	---	0	F	YL	---	---	5,520	160	---	1,920	3,760	22
12	Hoverrocker	4,273	8,007	12,280	2,508	2,160	12	14	B	SR	---	---	12,280	---	---	---	12,280	2,592
13	Twin Peaks	1,801	1,900	3,701	905	674	2	26	B	YL	---	---	3,701	---	---	---	3,701	776
14	Combine	11,915	20,082	31,997	3,156	2,731	6	14	B	RR, SR	---	480	15,597	15,920	3,810	19,067	9,120	3,006
15	Apache Creek	510	1,430	1,940	133 1/	305	1	3/	B	S	---	1,940	---	---	---	---	1,940	320
16	Black Canyon	10,452	890	11,342	2,496	1,245	39	52	B	RR	---	1,200	10,142	---	---	---	11,342	1,345
17	County Line	9,250	50	9,300	1,704	1,211	35	31	G	RR	---	3,200	6,100	---	---	---	9,300	1,452
18	Buck Canyon	5,979	1,286	7,265	598	606	6	0	G	SR	---	640	3,425	3,200	---	---	7,265	726
19	Harper	6,550	1,290	7,840	456	872	10	0	B	SR	---	---	6,560	1,280	---	1,020	6,820	910
20	Rocky John	1,000	2,014	3,014	448	240	---	46	C	SR	---	---	1,334	1,680	---	---	3,014	288
21	Web	1,260	2,790	4,050	605	295	---	51	B	RR	---	---	3,250	800	---	700	3,350	315
22	Summit Community	5,600	5,220	10,820	1,788	1,355	11	25	B	YL	---	9,060	1,760	---	---	560	10,260	1,561
23	Blue Creek	393	1,410	1,803	120 1/	120 2/	---	0	F	YL	---	1,803	---	---	---	---	1,803	120
24	San Jose Community	3,360	720	4,080	24	Ephemeral	---	---	D	E	---	---	2,480	1,600	---	3,880	200	Ephemeral
25	Yuma Wash	12,730	2,090	14,820	320	Ephemeral	---	---	E	E	---	---	9,060	5,760	---	6,780	8,040	Ephemeral
26	Tollgate	15,110	1,080	16,190	1,174	568	28	54	B	RR	---	---	8,990	7,200	---	7,300	8,890	748
27	Guthrie Peak	4,214	1,689	5,903	892	611	11	33	G	RR	---	800	5,103	---	---	---	5,903	732
28	Sheldon Mountains	29,000	18,180	47,180	8,318	3,675	34	56	B	SR	---	2,880	39,340	4,960	4,660	11,510	31,010	4,409
29	Sanders Wash	590	650	1,240	120	Ephemeral	---	---	E	E	---	---	---	1,240	---	1,240	---	Ephemeral
30	China Camp	6,230	1,610	7,840	864	694	8	21	B	RR	---	---	5,920	1,920	---	5,660	2,180	764

APPENDIX B (cont.)

No.	Grazing Unit Name	Land Status (Acres) Public Lands	Other	Total	1972-76 Avg. Lic. Use AUMs	Estimated Grazing Capacity AUMs	Wildlife Alloc. AUMs	Livestock Reduction from Avg. Lic. Use %	Type of Mgmt.	Grazing System	Range Condition Class Excel.	Good	Fair	Poor	Erosion Condition Class High	Moderate	Low	Est. Grzng. Cap/15 yrs. (AUMs) under Proposed Management
31	Croom	1,922	1,570	3,492	708	470	2	34	B	YL	---	3,492	---	---	---	3,492	---	562
32	Rhyolite Peak	4,770	9,600	14,370	1,932	1,175	9	40	B	SR	---	---	13,890	480	---	12,490	1,880	1,360
33	Sandia	1,320	40	1,360	144	Ephemeral	---	---	E	E	---	---	---	1,360	---	1,360	---	Ephemeral
34	Charlie Hill	1,800	1,110	2,910	576	374	2	35	B	YL	---	---	2,910	---	---	---	2,910	440
35	Sand Wash	870	1,480	2,350	180	Ephemeral	---	---	E	E	---	---	800	1,550	120	2,230	---	Ephemeral
36	Carlisle	17,620	10,630	28,250	3,744	2,712	17	28	B	YL,S,RR	---	4,480	22,410	1,360	5,160	5,620	17,470	3,154
37	Woods Canyon	12,676	12,982	25,658	2,640	2,641	16	1	C	RR	---	3,040	17,338	5,280	---	5,920	19,738	2,750
38	Horse	80	80	160	12	Ephemeral	---	---	E	E	---	---	---	160	160	---	---	Ephemeral
39	Gale	280	440	720	120	Ephemeral	---	---	E	E	---	---	---	720	360	360	---	Ephemeral
40	Franklin	380	1,760	2,140	160	100	---	37	F	YL	---	---	---	2,140	2,040	100	---	100
41	State Line	2,592	1,240	3,832	420	Ephemeral	---	---	E	E	---	---	640	3,192	---	2,762	1,070	Ephemeral
42	Pearson Mesa	1,330	1,120	2,450	288	Ephemeral	---	---	E	E	---	---	2,450	---	---	1,000	1,450	Ephemeral
43	Lazy "B"	108,970	53,460	162,430	24,263	22,670	130	7	G	DR,S,RR,YL	---	13,280	128,590	20,560	2,460	40,090	119,880	25,200
44	Horseshoe	27,157	9,927	37,084	3,943	2,295	51	43	B	RR	---	3,520	19,964	13,600	---	---	37,084	2,691
45	Little Doubtful	2,489	586	3,075	718	292	4	60	B	SR	---	520	2,235	320	---	---	3,075	336
46	Creosote	15,090	3,080	18,170	1,708	Ephemeral	---	---	E	E	---	---	12,090	6,080	8,670	5,560	3,940	Ephemeral
47	Munson Cienega	3,457	2,204	5,661	30	Ephemeral	---	---	D	E	---	---	2,461	3,200	1,520	2,461	1,680	Ephemeral
48	Hackberry	116,940	69,350	186,290	5,069 1/	2,801 2/	29	45	G	SR	---	12,960	87,730	85,600	52,440	85,950	47,900	3,149
49	Chimney	2,210	4,530	6,740	795	472	4	41	B	S	---	---	6,420	320	---	2,580	4,160	575
50	Ash Peak	9,463	3,939	13,402	1,430	1,044	14	28	A	RR	---	---	8,762	4,640	---	7,062	6,340	1,200
51	Artesia	6,378	1,704	8,082	180	Ephemeral	---	---	E	E	---	---	200	7,882	5,202	2,880	---	Ephemeral
52	Stockton Pass	7,680	12,950	20,630	1,508	482	14	69	G	S	---	---	---	20,630	8,500	12,130	---	560
53	Tanque	61,643	5,424	67,067	1,508	Ephemeral	---	---	E	E	---	400	14,240	52,427	23,580	43,087	400	Ephemeral
54	Van Gausig	8,790	1,910	10,700	1,480	465	16	70	G	SR	---	---	---	10,700	5,170	4,430	1,100	560
55	Badger Den	39,130	9,690	48,820	2,494	1,598	14	36	G	SR	---	520	16,800	31,500	33,830	9,970	5,020	1,760
56	Poppy Canyon	2,500	4,760	7,260	1,182	516	---	56	B	YL	---	3,200	480	3,580	---	3,240	4,020	570
57	Fisher	16,700	28,405	45,105	3,887	1,896	33	52	B	SR	---	---	9,280	35,825	18,460	22,405	4,240	2,175
58	Fan	8,510	240	8,750	1,794	973	1	46	G	S	600	---	5,910	2,240	6,510	2,240	---	1,201
59	Joy Valley	50,820	13,630	64,450	6,454	2,418	18	63	A	RR	---	1,440	22,400	40,610	5,800	38,130	20,520	3,000
60	Midway Canyon	3,750	2,065	5,815	784	690	6	13	C	DR	---	3,415	1,760	640	---	2,780	3,035	750

APPENDIX B (cont.)

No.	Grazing Unit Name	Land Status (Acres) Public Lands	Other	Total	1972-76 Avg. Lic. Use AUMs	Estimated Grazing Capacity AUMs	Wildlife Alloc. AUMs	Livestock Reduction from Avg. Lic. Use %	Type of Mgmt.	Grazing System	Range Condition Class Excel.	Good	Fair	Poor	Erosion Condition Class High	Moderate	Low	Est. Grzng. Cap/15 yrs. (AUMs) under Proposed Management
61	Hilburn	1,980	940	2,920	7	Ephemeral	---	---	D	E	---	---	---	2,920	640	2,280	---	Ephemeral
62	Murchison	41,459	1,735	43,194	2,957	2,400	---	19	A	RR,S	1,600	---	11,520	30,074	3,520	27,984	11,690	2,600
63	Flying "W"	3,570	4,640	8,210	1,551	509	5	68	B	SR	---	---	---	8,210	---	4,550	3,660	584
64	Polecat	1,971	25,234	27,205	384 1/	220 2/	---	43	F	YL	---	---	40	27,165	4,840	11,515	10,850	220
65	Bowie	620	710	1,330	7	Ephemeral	---	---	H	---	---	---	---	1,330	1,330	---	---	Ephemeral
66	Garret	5,570	10,260	15,830	1,422	Ephemeral	---	---	E	E	---	---	---	15,830	2,310	9,610	3,910	Ephemeral
67	Homestead	40	900	940	12 1/	4 2/	---	67	F	YL	---	---	---	940	---	940	---	4
68	San Simon	530	880	1,410	40	40	---	0	F	YL	---	---	---	1,410	---	1,200	210	40
69	Roostercomb	20,917	10,904	31,821	2,326	1,123	27	53	G	S,YL,SR	---	---	26,861	4,960	---	27,441	4,380	1,227
70	Camels Back	620	2,700	3,320	96 1/	96 2/	---	0	F	YL	---	---	---	3,320	---	1,120	2,200	96
71	Cedar Spring	2,015	2,772	4,787	746	564	20	27	B	S	---	---	3,027	1,760	---	800	3,987	604
72	Dos Cabezas Community	8,270	4,040	12,310	2,047	945	129	60	B	YL	---	---	1,440	10,870	---	6,170	6,140	1,029
73	Rough Mountain	17,630	14,170	31,800	1,961	615	85	73	B	YL	---	2,240	---	29,560	12,010	14,790	5,000	825
74	Happy Camp	1,980	320	2,300	353	116	38	78	B	YL	---	---	---	2,300	1,890	410	---	178
75	Silverstrike Community	8,460	10,785	19,245	2,486	775	31	70	B	SR	---	320	1,280	17,645	300	14,905	4,040	955
76	Emigrant Canyon	560	23,481	24,041	36 1/	36 2/	---	0	F	YL	---	160	5,120	18,761	5,510	8,500	10,031	36
77	Portal Road	320	---	320	22	Ephemeral	---	---	E	E	---	---	---	320	---	320	---	Ephemeral
78	Oil Well	1,120	3,930	5,050	116	115	---	0	B	S	---	---	---	5,050	---	3,930	1,120	144
79	Vanar	16,820	1,520	18,340	1,200	Ephemeral	---	---	E	E	---	---	10,560	7,780	---	6,730	11,610	Ephemeral
80	Ivanhoe	1,710	4,880	6,590	576 1/	576 2/	24	0	B	S	---	1,920	---	---	---	4,010	2,580	674
81	Siphon Canyon	666	630	1,296	360	123	27	73	B	SR	---	1,196	100	---	---	340	956	162
82	Nine Mile	300	1,060	1,360	24 1/	24 2/	---	0	F	YL	---	220	---	1,140	---	1,360	---	24
83	Apache Springs	4,955	1,260	6,215	988	1,097	101	0	B	S	---	4,455	1,600	160	---	1,000	5,215	1,301
84	Mulkins	2,976	27,360	30,336	120 1/	120 2/	---	0	F	YL	---	---	9,280	21,056	5,830	17,496	7,010	120
85	Saltbush	1,120	2,480	3,600	99	108	---	0	B	S	---	---	---	3,600	---	2,200	1,400	125
86	El Paso	160	---	160	2	6	---	0	F	YL	---	---	---	160	---	160	---	6
87	Realty	475	640	1,115	43	12	---	72	F	YL	---	---	300	815	---	1,115	---	12
88	Whitetail	7,360	3,310	10,670	951	240	---	75	B	SR	---	---	640	10,030	---	9,100	1,570	290
89	Clayton	3,198	640	3,838	235	Ephemeral	---	---	E	E	---	---	2,718	1,120	---	3,618	220	Ephemeral
90	Blue Mountain	9,450	12,450	21,900	2,162	944	20	57	B	SR	---	---	6,560	15,340	----	19,060	2,840	1,170

APPENDIX B (cont.)

No.	Grazing Unit Name	Land Status (Acres) Public Lands	Other	Total	1972-76 Avg. Lic. Use AUMs	Estimated Grazing Capacity AUMs	Wildlife Alloc. AUMs	Livestock Reduction from Avg. Lic. Use %	Type of Mgmt.	Grazing System	Range Condition Class Excel.	Good	Fair	Poor	Erosion Condition Class High	Moderate	Low	Est. Grzng. Cap/15 yrs. (AUMs) under Proposed Management
91	Midway	2,406	3,156	5,562	298	72	---	76	C	S	---	---	3,162	2,400	---	5,402	160	100
92	Paradise	823	11,919	12,742	170 1/	170 2/	---	0	F	YL	---	---	9,542	3,200	3,000	9,742	---	170
93	Contour	54	2,170	2,224	0	4 2/	---	0	H	---	---	---	800	1,424	---	510	1,714	4
94	Cave Creek	1,080	19,690	20,770	38 1/	38 2/	---	0	H	---	---	---	5,920	14,850	---	6,310	14,460	38
95	King	620	1,700	2,320	17	40 2/	---	0	H	---	---	---	---	2,320	---	---	2,320	40
96	Roberds	840	4,690	5,530	0	54 2/	---	0	H	---	---	---	---	5,530	---	4,300	1,230	54
97	Rodeo	400	800	1,200	28 1/	26 2/	---	7	H	---	---	---	---	1,200	---	1,200	---	26
98	Red Mountain	1,900	3,020	4,920	432 1/	432 2/	---	0	F	YL	---	1,900	3,020	---	---	---	4,920	432
99	Small	80	---	80	14	Ephemeral	---	---	E	E	---	---	---	80	---	80	---	Ephemeral
100	Lindsey	105	---	105	0	Ephemeral	---	---	D	E	---	---	---	105	---	105	---	Ephemeral
101	Foote Wash	240	240	480	0	Ephemeral	---	---	D	E	---	---	---	480	140	340	---	Ephemeral
102	Cemetery	360	290	650	0	Ephemeral	---	---	H	---	---	---	200	450	---	650	---	Ephemeral
103	Gripe	770	130	900	0	Ephemeral	---	---	D	E	---	---	820	80	---	760	140	Ephemeral
104	Stockton	920	---	920	0	Ephemeral	---	---	D	E	---	---	80	840	870	50	---	Ephemeral
105	Marijaldi	360	680	1,040	17	Ephemeral	---	---	D	E	---	---	340	700	140	900	---	Ephemeral
106	Dankworth	200	40	240	12	Ephemeral	---	---	E	E	---	---	240	---	---	240	---	Ephemeral
107	Gibson	12	15	27	12	Ephemeral	---	---	E	E	---	---	27	---	---	27	---	Ephemeral
108	Swift	40	---	40	2	Ephemeral	---	---	H	---	---	---	---	40	---	40	---	Ephemeral
109	Royce	120	---	120	0	Ephemeral	---	---	E	E	---	---	---	120	---	120	---	Ephemeral
110	Artwell	160	---	160	24	24	---	0	F	YL	---	---	---	160	160	---	---	24
111	Pioneer Mountain	745	2,777	3,522	130 1/	64 2/	---	51	F	YL	---	1,303	2,219	---	---	3,522	---	64
112	Silver Creek	1,402	1,923	3,325	216 1/	126 2/	---	42	F	YL	---	---	3,325	---	---	560	2,765	126
113	Pasadena Mountain	2,917	13,736	16,653	411 1/	283 2/	---	31	F	YL	---	400	14,333	1,920	---	950	15,703	283
114	El Capitan	680	1,340	2,020	89 1/	185	5	--- 3/	B	YL,DR	---	---	2,020	---	---	---	2,020	220
115	Ponderosa	902	1,200	2,102	54 1/	54 2/	---	0	F	YL	700	---	1,402	---	---	200	1,902	54
116	Gilson Wash	490	583	1,073	83 1/	38 2/	---	54	F	YL	480	---	593	---	---	1,073	---	38
117	Dripping Springs	13,344	9,667	23,011	1,299 1/	1,338	100	--- 3/	B	S	2,240	4,480	5,891	10,400	---	6,150	16,861	1,396
118	Limestone	8,000	1,610	9,610	700 1/	432	72	--- 3/	B	YL	2,240	---	4,490	2,880	---	9,610	---	492
119	Mescal Mountain	7,310	240	7,550	804 1/	686	110	--- 3/	B	YL	5,310	---	2,240	---	---	---	7,550	900
120	Hook and Line	5,015	231	5,246	973 1/	432	38	--- 3/	B	YL	1,920	---	3,326	---	---	---	5,246	488

APPENDIX B (cont.)

No.	Grazing Unit Name	Land Status (Acres) Public Lands	Other	Total	1972-76 Avg. Lic. Use AUMs	Estimated Grazing Capacity AUMs	Wildlife Alloc. AUMs	Livestock Reduction from Avg. Lic. Use %	Type of Mgmt.	Grazing System	Range Condition Class Excel.	Good	Fair	Poor	Erosion Condition Class High	Moderate	Low	Est. Grzng. Cap/15 yrs. (AUMs) under Proposed Management
121	Christmas	7,120	3,115	10,235	468 1/	714	54	--- 3/	B	YL	1,280	---	4,320	4,635	---	---	10,235	830
122	Hi-Y	207	280	487	25 1/	5 2/	---	80	F	YL	---	---	---	487	---	---	487	5
123	Hidalgo	13,545	2,995	16,540	1,976 1/	1,257	105	--- 3/	B	YL	---	12,380	2,560	1,600	---	---	16,540	1,418
124	Piper Springs	5,224	1,240	6,464	189 1/	Ephemeral	---	---	E	E	---	80	2,880	3,504	---	---	6,464	Ephemeral
125	Gypsum	320	320	640	39 1/	Ephemeral	---	---	E	E	---	---	---	640	---	---	640	Ephemeral
126	Dudleyville	2,188	3,840	6,028	247 1/	Ephemeral	---	---	E	E	---	---	1,200	4,828	---	6,028	---	Ephemeral
127	Malpais Hill	3,838	6,080	9,918	145 1/	Ephemeral	---	---	E	E	---	---	280	9,638	---	9,918	---	Ephemeral
128	Painted Cave	4,268	17,090	21,358	495 1/	495 2/	---	0	F	YL	---	2,400	6,880	12,078	---	3,520	17,838	495
129	Hell Hole	1,602	11,274	12,876	381 1/	297 2/	---	22	F	YL	---	5,600	7,276	---	---	12,876	---	297
130	Aravaipa	8,674	11,842	20,516	4,937	2,743	91	46	B	YL,DR	---	1,920	13,316	5,280	---	20,516	---	3,113
131	Stanley Butte	400	0	400	108	40	---	63	F	YL	---	---	---	400	---	400	---	40
132	Horse Mountain	1,788	160	1,948	240	240	33	14	B	YL	---	---	---	1,948	---	1,948	---	309
133	Laurel Canyon	381	4,777	5,158	53 1/	53 2/	---	0	F	YL	---	---	3,558	1,600	---	5,158	---	53
134	Klondyke	4,209	9,742	13,951	648 1/	3,001	73	--- 3/	B	S	---	---	13,351	600	---	13,951	---	3,673
135	Squaw Creek	2,172	6,204	8,376	390 1/	861	33	--- 3/	B	YL	---	---	7,256	1,120	---	8,376	---	1,074
136	Turkey Creek	4,013	13,070	17,083	377 1/	377 2/	---	0	F	YL	---	2,400	14,683	---	---	---	17,083	377
137	Panorama	1,532	24,556	26,088	144 1/	144 2/	---	0	F	YL	---	480	25,408	200	---	---	26,088	144
138	Brandenburg Mountain	520	4,914	5,434	68 1/	23 2/	---	66	F	YL	---	---	5,434	---	---	---	5,434	23
139	Holy Joe	1,653	492	2,145	150 1/	79	19	--- 3/	B	DR	---	---	1,345	800	---	---	2,145	110
140	Massacre	4,014	2,980	6,994	180 1/	Ephemeral	---	---	E	E	---	---	1,600	5,394	---	---	6,994	Ephemeral
141	Zapata	6,222	960	7,182	584 1/	Ephemeral	---	---	E	E	---	---	2,080	5,102	---	4,722	2,460	Ephemeral
142	Dry Camp	1,400	40	1,440	108 1/	Ephemeral	---	---	E	E	---	---	---	1,440	---	1,440	---	Ephemeral
143	Tiger	3,989	0	3,989	599	Ephemeral	---	---	E	E	---	---	700	3,289	---	---	3,989	Ephemeral
144	Reliable	610	600	1,210	80 1/	47 2/	---	41	F	YL	---	320	890	---	---	---	1,210	47
145	Copper Creek	7,620	21,530	29,150	1,715 1/	2,940	90	--- 3/	C	S	---	10,400	15,230	3,520	---	---	29,150	3,234
146	Schoenholzer Canyon	6,420	2,560	8,980	782 1/	502	79	--- 3/	B	SR	---	480	8,500	---	---	---	8,980	652
147	Hotwell	7,077	4,680	11,757	530 1/	Ephemeral	---	---	E	E	---	---	3,840	7,917	---	---	11,757	Ephemeral
148	Y.L.E.	2,980	7,672	10,652	335 1/	1,037	29	--- 3/	C	DR	---	---	10,132	520	---	---	10,652	1,108
149	Kielberg	1,838	21,120	22,958	276 1/	Ephemeral	---	---	E	E	---	---	15,598	7,360	---	22,958	---	Ephemeral
150	Crystal Cave	356	740	1,096	46 1/	Ephemeral	---	---	E	E	---	---	480	616	---	80	1,016	Ephemeral

APPENDIX B (cont.)

No.	Grazing Unit Name	Land Status (Acres) Public Lands	Other	Total	1972-76 Avg. Lic. Use AUMs	Estimated Grazing Capacity AUMs	Wildlife Alloc. AUMs	Livestock Reduction from Avg. Lic. Use %	Type of Mgmt.	Grazing System	Range Condition Class Excel.	Good	Fair	Poor	Erosion Condition Class High	Moderate	Low	Est. Grzng. Cap/15 yrs. (AUMs) under Proposed Management
151	Diamond Bar	27,859	1,761	29,620	4,783	3,396	96	31	A	S	---	5,120	12,180	12,320	---	8,370	21,250	3,630
152	Tom Springs	16,485	470	16,955	961	802	46	21	G	DR	---	200	12,275	4,480	---	---	16,955	1,010
153	Fort Thomas	570	0	570	0	Ephemeral	---	---	D	E	---	---	---	570	---	---	570	Ephemeral
154	Day Mine	52,586	3,915	56,501	4,376	3,748	148	18	A	RR	---	5,760	24,320	26,421	---	---	56,501	3,960
155	North Eden Community	3,000	0	3,000	34	Ephemeral	---	---	D	E	---	---	3,000	---	---	---	3,000	Ephemeral
156	South Eden Community	5,440	0	5,440	27	Ephemeral	---	---	D	E	---	---	5,440	---	---	---	5,440	Ephemeral
157	Billingsley Creek	430	170	600	46	Ephemeral	---	---	D	E	---	---	600	---	---	---	600	Ephemeral
158	Bryce	20,874	32,397	53,271	6,830	2,882	43	58	B	SR	1,600	---	27,991	23,680	---	1,970	51,301	3,100
159	Kimball Community	1,520	0	1,520	0	Ephemeral	---	---	D	E	---	---	1,520	---	---	---	1,520	Ephemeral
160	Talley Wash	7,220	2,413	9,633	444	Ephemeral	---	---	E	E	200	---	4,473	4,960	---	880	8,753	Ephemeral
161	Skinner Community	1,330	230	1,560	0	Ephemeral	---	---	D	E	---	---	1,560	---	---	40	1,520	Ephemeral
162	Rest Haven	1,925	370	2,295	0	Ephemeral	---	---	D	E	---	---	1,815	480	---	1,555	740	Ephemeral
163	Lone Star	18,466	14,391	32,857	1,840	1,175	35	38	G	SR	---	---	17,177	15,680	1,940	8,660	22,257	1,380
164	Sanchez	2,920	220	3,140	322	149	5	55	B	YL	---	---	3,140	---	---	200	2,940	160
165	Johnny Creek	18,597	4,835	23,432	2,771	2,132	44	25	A	DR	5,120	---	18,312	---	---	6,740	16,692	2,296
166	Bonita Creek	22,763	6,521	29,284	4,877	3,236	68	35	A	DR	1,600	---	27,684	---	---	1,580	27,704	3,625
167	Bullgap Community	8,936	100	9,036	1,496	947	23	38	B	SR	1,760	---	7,276	---	---	---	9,036	1,060
168	Turtle Mountain	16,535	5,015	21,550	3,360	2,522	62	27	B	YL	13,070	---	8,480	---	---	---	21,550	2,642
169	Geronimo	951	484	1,435	64	Ephemeral	---	---	D	E	---	---	1,035	400	635	800	---	Ephemeral
170	Emery	1,540	200	1,740	130	Ephemeral	---	----	D	E	---	---	1,100	640	1,420	320	---	Ephemeral
171	Alkalai	3,328	220	3,548	480	Ephemeral	---	---	E	E	---	---	3,548	---	500	3,048	---	Ephemeral
172	Fine Wash	2,580	670	3,250	237	Ephemeral	---	---	D	E	---	---	2,610	640	1,840	1,410	---	Ephemeral
173	Bench Mark	280	40	320	32	Ephemeral	---	---	D	E	---	---	320	---	---	320	---	Ephemeral
174	North Fort Thomas Comm.	1,685	40	1,725	216	Ephemeral	---	---	E	E	---	---	800	925	1,425	300	---	Ephemeral
175	South Fort Thomas Comm.	1,280	0	1,280	60	Ephemeral	---	---	D	E	---	---	480	800	1,080	200	---	Ephemeral
176	Red Knolls	320	160	480	0	Ephemeral	---	---	D	E	---	---	---	480	280	200	---	Ephemeral
177	Goodwin Wash	120	70	190	19	19	---	0	F	YL	---	---	190	---	---	190	---	19
178	White Spring	1,520	245	1,765	290	156	---	46	F	YL	---	---	1,765	---	---	1,765	---	156
179	Cobre Grande	440	270	710	120	60	---	50	F	YL	---	240	---	470	---	710	---	60
180	Black Rock	2,560	963	3,523	420	311	35	34	B	SR	---	---	---	3,523	---	3,523	---	415

APPENDIX B (cont.)

No.	Grazing Unit Name	Land Status (Acres) Public Lands	Other	Total	1972-76 Avg. Lic. Use AUMs	Estimated Grazing Capacity AUMs	Wildlife Alloc. AUMs	Livestock Reduction from Avg. Lic. Use %	Type of Mgmt.	Grazing System	Range Condition Class Excel.	Good	Fair	Poor	Erosion Condition Class High	Moderate	Low	Est. Grzng. Cap/15 yrs. (AUMs) under Proposed Management
181	Spenazuma	1,445	485	1,930	228	262	22	0	B	SR	---	1,930	---	---	---	1,930	---	300
182	Holdup Canyon	11,370	4,010	15,380	1,279	587	107	62	B	SR	---	---	15,220	160	1,320	14,060	---	770
183	Jackson Mountain	3,138	2,234	5,372	1,152	552	48	56	B	YL,SR	---	---	1,920	3,452	---	5,372	---	660
184	White House	16,994	8,880	25,874	1,708	Ephemeral	---	---	E	E	---	---	21,234	4,640	5,740	20,134	---	Ephemeral
185	Oso Largo	2,090	430	2,520	406	Ephemeral	---	---	E	E	---	---	400	2,120	2,100	420	---	Ephemeral
186	Bear Springs	3,400	860	4,260	27	Ephemeral	---	---	D	E	---	---	3,300	960	4,060	200	---	Ephemeral
187	Pima	1,360	480	1,840	121	Ephemeral	---	---	D	E	---	---	---	1,840	1,520	320	---	Ephemeral
188	Mesa	670	100	770	0	Ephemeral	---	---	D	E	---	---	---	770	385	385	---	Ephemeral
189	Mud Hollow	216	80	296	0	Ephemeral	---	---	D	E	---	---	---	296	---	296	---	Ephemeral
190	Spear Community	17,015	21,420	38,435	845 1/	Ephemeral	---	---	E	E	---	---	30,435	8,000	9,300	27,415	1,720	Ephemeral
191	Mud Springs Community	1,640	1,550	3,190	418	Ephemeral	---	---	E	E	---	---	3,190	---	---	3,190	---	Ephemeral
192	Lefthand Canyon	600	1,530	2,130	36 1/	Ephemeral	---	---	E	E	---	---	2,130	---	220	1,910	---	Ephemeral
193	Mixed Up	80	0	80	12	Ephemeral	---	---	D	E	---	---	---	80	80	---	---	Ephemeral
	Grazing Unit Totals	1,346,709	999,353	2,346,062							61,640	145,564	1,230,334	908,524	264,787	886,625	1,194,650	
	Lands not included within grazing unit boundaries	2,972	455,678	458,650														
	ES Totals	1,349,681	1,455,031	2,804,712														

APPENDIX C
AMP OBJECTIVES

Plant Symbol	Scientific Name	Common Name
Anba	Andropogon barbinodis	Cane beardgrass
Arlu	Artemisia ludoviciana	Herbaceous sage
Atca	Atriplex canescens	Four-wing saltbush
Bocu	Bouteloua curtipendula	Side-oats grama
Boer	Bouteloua eriopoda	Black grama
Bogr	Bouteloua gracilis	Blue grama
Bohi	Bouteloua hirsuta	Hairy grama
Boro	Bouteloua rothrockii	Rothrock grama
Caer	Calliandra eriophylla	False mesquite
Cebr	Cercocarpus breviflorus	Hairy mountain mahogany
Cefe	Ceanothus fendleri	Buck brush
Cegr	Ceanothus greggii	Desert ceanothus
Cyda	Cynodon dactylon	Bermuda grass
Dafo	Dalea formosa	Feather dalea
Eptr	Ephedra trifurca	Mormon tea
Erfa	Eriogonum fasciculatum	California buckwheat
Erin	Eragrostis intermedia	Plains lovegrass
Erle	Eragrostis lehmanniana	Lehmann lovegrass
Erwr	Eriogonum wrightii	Shrubby buckwheat
Eula	Eurotia lanata	Winter fat
Hibe	Hilaria belangeri	Curly mesquite
Himu	Hilaria mutica	Tobosa
Krpa	Krameria parvifolia	Range ratany
Lyph	Lycurus phleoides	Wolf-tail
Mupo	Muhlenbergia porteri	Bush muhly
Paan	Panicum antidotale	Blue panicgrass
Paob	Panicum obtusum	Vine mesquite
Prju	Prosopis juliflora	Honey mesquite
Sema	Setaria macrostachya	Plains bristlegrass
Sich	Simmondsia chinensis	Jojoba
Sihy	Sitanion hystrix	Squirreltail
Soha	Sorghum halepense	Johnson grass
Spai	Sporobolus airoides	Alkali sacaton
Spcr	Sporobolus cryptandrus	Sand dropseed
Trca	Trichachne californica	Arizona cotton-top
Trmu	Tridens muticus	Slim tridens

No objectives are listed on grazing units proposed for custodial, ephemeral, or unallocated management.

Custodial management is proposed on the following grazing units: 1, 11, 23, 40, 64, 67, 68, 70, 76, 82, 84, 86, 87, 92, 98, 110, 111, 112, 113, 115, 116, 122, 128, 129, 131, 133, 136, 137, 138, 144, 177, 178, and 179.

Ephemeral management is proposed on the following grazing units: 10, 24, 25, 29, 33, 35, 38, 39, 41, 42, 46, 47, 51, 53, 61, 66, 77, 79, 89, 99, 100, 101, 103, 104, 105, 106, 107, 109, 124, 125, 126, 127, 140, 141, 142, 143, 147, 149, 150, 153, 155, 156, 157, 159, 160, 161, 162, 169, 170, 171, 172, 173, 174, 175, 176, 184, 185, 186, 187, 188, 189, 190, 191, 192, and 193.

Grazing is unallocated on the following grazing units: 65, 93, 94, 95, 96, 97, 102, and 108.

APPENDIX C
AMP OBJECTIVES

Resource Objectives for Grazing Units Under a Proposed Rest-Rotation Grazing System

GRAZING UNIT NO.	ALLOTMENT NAME AND NO.	WILDLIFE HABITAT	WATERSHED PROTECTION	LIVESTOCK PRODUCTION ON PUBLIC LANDS	VEGETATION (KEY SPECIES)
14	Combine Allotments #5019, #5037, #5051, #5052, and #5057	Increase ground cover for small game and ground nesting birds by increasing vegetation over 15 years as stated in vegetation objectives for this allotment.	Decrease SFF as follows: Willow Mt. #1, 42 to 35; Willow Mt. #2, 26 to 20; J#1, 38 to 30; J#2, 47 to 40. Increase plant density as follows: Willow Mt. #1, 11% to 16%; Willow Mt. #2, 15% to 20%; J#1, 10% to 15%; J#2, 5% to 10%.	Increase forage available to livestock from 227 CYLs to 250 CYLs in 15 years.	Increase key species over 15 yrs. as follows: Willow Mt. #1--Himu from 30% to 35%. Willow Mt. #2--Boer from trace to 3%, Bocu from trace to 3%, Erwr from trace to 2%. Chico--Boer from trace to 3%. Himu from 5% to 10%. J#1--Boer from 6% to 9%, Bocu from trace to 3%. J#2--Boer from trace to 3%, Himu from 20% to 25%.
16	Black Canyon Allotment #5021	Increase wildlife cover by establishing 150 to 200 cottonwood trees per mile along Gila River bottom.	In 15 years reduce the present SSF from 41 to 36. Increase plant density from 10% to 20% in 15 years.	Increase forage available to livestock from 60 CYLs to 100 CYLs in 15 years.	See watershed objective.
17	County Line Allotment #5022	Increase wildlife habitat for all wildlife species by increasing plant density from 20% to 25%.	Reduce present SSF from 35 to 30 and increase plant density from 20% to 25% in 15 years.	Increase forage available to livestock from 98 CYLs to 142 CYLs in 15 years.	See watershed objective.
21	Web Allotment #5026	Increase wildlife habitat by increasing composition of Boer from trace to 8%, Bocu from 7% to 12% and maintaining Himu at 50% over a 15-year period.	In 15 years decrease SSF from 31 to 26, and increase plant density from 14% to 18%.	Increase forage available to livestock from 15 CYLs to 19 CYLs in 15 years.	Increase composition of Boer from trace to 8%, Bocu from 7% to 12%, and maintain Himu level at 50% over a 15-year period.
26	Tollgate Allotment #5033	Increase ground cover of perennial plant species from 20% to 25% over 15-year period to increase cover for birds and small mammals.	Reduce present SSF by 5 points over 15 years and increase ground cover of perennial species from 20% to 25% over 15 years.	Increase forage available to livestock from 45 CYLs to 60 CYLs in 15 years.	Key species are Boer, Bocu, and Himu. See watershed objective.
27	Guthrie Peak Allotment #5034	Provide feed and cover for 20 deer and 15 javelina over a 15-year period.	Increase density of perennial grass cover from 20% to 25% over 15 years.	Increase forage available to livestock from 50 CYLs to 90 CYLs in 15 years.	Key species are Boer, Bocu, and Himu. See watershed objective.
30	China Camp Allotments #5038 and #5043	Provide food and cover for 25 deer.	Decrease SSF in Goat Pasture from 62 to 52, in Iron Canyon from 31 to 28 over 15 years. Increase plant density in Goat Pasture from 16% to 25%, in Flourspar from 16% to 25%, and Iron Canyon from 20% to 28% in 15 years.	Increase forage available to livestock from 51 CYLs to 80 CYLs in 15 years.	Increase composition in Goat Pasture as follows--Himu from 11% to 18%, Boer from 11% to 18%. In Flourspar--Boer from trace to 8%, Bocu from 6% to 10%, and Himu from 25% to 30%. In Iron Canyon--Boer from 5% to 8%, Bocu from 5% to 10%, and Himu from 10% to 15% in 15 years.
37	Woods Canyon Allotment #5049	COORDINATED AMP Soil Conservation Service (SCS) took lead in writing this plan, no objectives were stated.			
44	Horseshoe Allotments #5059, #5060, #5062	Reserve 108 AUMs of forage for exclusive wildlife use. Increase vegetation cover for additional habitat for all wildlife species.	Reduce SSF by 5 to 10 points in those areas with slight to moderate erosion. Increase plant density by 15% to 25%.	Increase forage available to livestock from 170 CYLs to 220 CYLs.	Key species are Himu, Bocu, Bohi, and Boer. See watershed objective.
50	Ash Peak Allotment #5105	Produce feed and habitat for 10 mule deer and 20 javelina.	In 15 years increase plant density in the poor sites from 5% to 15% and in the better sites from 15% to 25%.	Increase forage available to livestock from 87 CYLs to 115 CYLs in 15 years.	See watershed objective.
59	Joy Valley Allotment #5115	Provide forage and cover for 20 mule deer. Maintain present javelina habitat.	In 15 years increase basal density as follows: Gold Hill, 17% to 20%; Artesia, 15% to 17%; Tule, 17% to 22%; North, 12% to 14%; Copper, 13% to 15%. Reduce SSF in 15 years as follows: Gold Hill, 45 to 42; Orange Butte, 53 to 50; Tule, 39 to 37; Artesia, 64 to 60; Copper, 55 to 52.	Maintain present levels of forage available to livestock at 417 CYLs.	Increase basal density of key species in 15 years as follows: Gold Hill--Bocu from 1% to 4%, Himu from 3% to 5%, Atca from trace to 3%. North--Himu from 3% to 5%, Boer from trace to 3%, Atca from trace to 3%. Copper--Atca from 4% to 7%, Boer from trace to 2%, Himu from trace to 3%. Artesia--Atca from 7% to 9%, Boer from trace to 2%, Himu from trace to 2%.
62	Murchison Allotment #5118	Develop the waterfowl habitat by deepening existing waters. Establish waterfowl food plants around the water.	Increase perennial grass cover in upland sites from 5% to 15% and in the bottoms from 15% to 25% over 15 years.	Produce enough forage for livestock to support 232 CYLs over 15 years.	Key species are as follows: Antelope Well--Erle; New Well--Boer, Spcr, Atca; Olga--Himu, Spai; West Well--Spai, Atea; Contest Well--Paan, Soha; East--Atca.
154	Day Mine #4604	Provide forage for 45 javelina.	Over 15 years increase vegetation density as follows: Creosotebush Type, 7% to 10%; Desert Shrub Type, 15% to 20%; Mountain Shrub Type, 25% to 35%.	Increase forage available to livestock from 328 CYLs to 410 CYLs over 15 years.	Increase forage species over 15 years as follows: Creosotebush Type--Himu from 5% to 10%; Desert Shrub Type--Hibe and Himu from 12% to 18%; Mountain Shrub Type--Bocu, Hibe, and Himu from 15% to 25%.

Resource Objectives for Grazing Units Under a Proposed Santa Rita Grazing System

GRAZING UNIT NO.	ALLOTMENT NAME AND NO.	WILDLIFE HABITAT	WATERSHED PROTECTION	LIVESTOCK PRODUCTION ON PUBLIC LANDS	VEGETATION (KEY SPECIES)
8	Clifton Place Allotment #5012	Increase percent composition of Erwr from trace amounts to 2-3% for deer habitat.	In 15 years, reduce SSF in key area #1 from 36 to 32, in key area #2 from 33 to 30, in key area #3 from 32 to 30, and in key area #4 from 24 to 22. Increase present percent plant density in 15 years in key area #1 from 18% to 21%, in key area #2 from 8% to 11%, in key area #3 from 16% to 19%, in key area #4 from 8% to 11%.	Increase forage available to livestock from 87 CYLs to 100 CYLs in 15 years.	Increase percent composition of Bocu in 15 years in key area #1 from trace to 3%; in key area #2 from trace to 5%; in key area #3 from trace to 5%; in key area #4 from trace to 3%.
9	Airport Allotment #5013	Improve wildlife habitat by increasing Caer and Dafo densities from trace to 2% in 15 years.	Increase vegetation density in key area #1 from 9% to 14% and in key area #2 from 10% to 15% in 15 years.	Increase forage available to livestock from 194 CYLs to 205 CYLs in 15 years.	Increase percent composition of Bocu in key areas #1 and #2 from trace to 5% in 15 years. Increase Himu composition from 5% to 10% in 15 years in key area #1 and maintain Himu composition in key area #2 at 40%.
12	Hoverrocker Allotment #5017	Increase habitat for ground nesting birds by increasing plant density from 15% to 25% in key area #1 and from 18% to 28% in key area #2 in 15 years.	In 15 years, increase plant densities from 15% to 25% in key area #1 and from 18% to 28% in key area #2. Reduce SSF from 34 to 30 in key areas 1 and 2, and maintain present SSF of 18 over the rest of the allotment.	Maintain level of forage available to livestock at the present 288 CYL capacity.	In 15 years increase Boer composition from 13% to 20% in key area #1 and from trace to 10% in key area #2. Increase Bocu composition from 6% to 15% in key area #1, and from trace to 10% in key area #2.
18	Black Canyon Allotment #5023	Improve habitat for all wildlife species by increasing plant density from 10% to 20% in 15 years.	In 15 years reduce SSF from 34 to 29, and increase plant density from 10% to 20%.	Increase forage available to livestock from 79 CYLs to 94 CYLs in 15 years.	See watershed objective.
19	Harper Allotment #5024	Maintain feed and cover for 15 to 20 deer and 30 javelina.	Increase the perennial grass density to 25% over 15 years.	Maintain forage available to livestock at the present level of 72 CYLs.	See watershed objective.
20	Rocky John Allotment #5025	COORDINATED AMP SCS took the lead in writing this plan: no objectives were stated.			
28	Sheldon Mountain Allotments #5035 and #5044	Provide food and cover for 105 mule deer.	Over 15 years decrease present SSF from 38 to 33 in Wampoo pasture, from 47 to 44 in Hunter pasture and from 41 to 37 in Sexton pasture. Also increase density as follows: Wampoo from 15% to 19%; Hunter from 10% to 13%; Sexton from 11% to 14%.	Increase forage available to livestock from 303 CYLs to 450 CYLs in 15 years.	Key species in Wampoo pasture is Himu. Key species in Hunter pasture are Himu and Boer. See watershed objective.
32	Rhyolite Allotment #5041	Provide food and cover for 50 deer and 50 javelina. Increase Erwr from 2% to 10% for increased wildlife forage.	Increase perennial grass cover from 20% to 25% in 15 years.	Increase forage available to livestock from 97 CYLs to 120 CYLs in 15 years.	Key species are Boer, Bocu, Himu, and Erwr. See watershed objective.
45	Little Doubtful #5061	Provide feed and cover for 15 to 20 deer.	In 15 years reduce present SSF of 60 to 40 and increase vegetation density from 10% to 20%.	Increase forage available to livestock from 24 CYLs to 40 CYLs in 15 years.	Key species are Himu, Bocu, Bohi, and Boer. See watershed objective.
48	Hackberry Allotment #5103	Improve habitat by increasing forage for food and cover.	Over 15 years reduce SSF as follows: E. Slickrock, 42 to 39; 111, 46 to 42; N. Purebred, 36 to 30; Whitlock Peak, 40 to 37; West Steer, 60 to 56; Rabbit Farms, 62 to 59. Over 15 years increase plant density as follows: E. Slickrock, 15% to 16%; 111, 12% to 14%; N. Purebred, 20% 20 24%; Whitlock Peak, 15% to 18%; W. Steer, 11% to 13%; Rabbit Farm, 12% to 14%.	Increase forage available to livestock from 231 CYLs to 260 CYLs in 15 years.	Increase key species over 15 years as follows: E. Slickrock--Himu from 12% to 13%, Boer from 8% to 12%. 111--Himu from 2% to 4%, Boer from 2% to 5%. N. Purebred--Himu from 90% to 92%. Whitlock Peak--Himu from 21% to 23%, Boer from 1% to 3%. W. Steer--Himu from 11% to 13%, Boer from 1% to 3%. Rabbit Farm-Atca from 8% to 11%, Spcr from trace to 2%.
54	Van Gausig Allotment #5109	Increase density of Caer in prime mule deer range from trace to 2%.	Reduce SSF in 15 years in key areas as shown: Seeded, 30 to 24; Headquarters, 43 to 35; South, 34 to 30.	Increase forage available to livestock from 37 CYLs to 55 CYLs in 15 years.	Increase density of key species over 15 years as follows: Seeded--Erle from 8% to 12%. Headquarters--Bocu from trace to 2%. South--Himu from 1% to 5%. Big Tank--Himu from trace to 3%.
55	Badger Den Allotments #5110 and #5113	Reserve 73 AUMs for wildlife use.	Improve SSF and plant density in 15 years as follows: SSF: #1, 45 to 40; #2, 70 to 65; #3, 38 to 34; #4, 55 to 50; #5, 60 to 54; #6, 46 to 39; #8, 56 to 50; #9, 70 to 64; #10, 56 to 48. Plant density: #1, 4% to 8%; #2, 8% to 12%; #3, 18% to 22%; #4, 12% to 15%; #5, 10% to 13%; #6, 4% to 9%; #8, 6% to 9%; #9, 10% to 13%; #10, 14% to 20%.	Increase forage available for livestock from 132 CYLs to 160 CYLs in 15 years.	Increase density of key species over 15 years as follows: #1--Erle from 2% to 5%. #2--Himu from 3% to 5%. #3--Spai from 25% to 30%, Himu from 20% to 22%. #4--Himu from 8% to 11%. #5--Himu from 50% to 54%. #6--Paan from 9% to 15%, Erle from 1% to 3%, Atca from 5% to 8%.
57	Fisher Allotment #5112	Improve and increase habitat by increasing plant density and percent composition of the key species.	In 15 years reduce SSF as follows: Dial, 56 to 50. Gulch, 42 to 35. In 15 years increase plant density as follows: Dial, 9% to 12%; Gulch, 5% to 8%.	Increase forage available to livestock from 74 CYLs to 85 CYLs in 15 years.	Increase percent composition of key species in 15 years as follows: ,Dial Pasture--Himu from 1% to 3%, Spcr from trace to 2%, Sema from trace to 2%. Gulch Pasture--Himu from 48% to 50%, Mupo from trace to 2%.

Resource Objectives for Grazing Units Under a Proposed Santa Rita Grazing System

GRAZING UNIT NO.	ALLOTMENT NAME AND NO.	WILDLIFE HABITAT	WATERSHED PROTECTION	LIVESTOCK PRODUCTION ON PUBLIC LANDS	VEGETATION (KEY SPECIES)
63	Flying "W" Allotment #5119	Reserve 9 CYLs for wildlife populations, which include 40 mule deer.	Over 15 years improve SSF and plant density as shown: SSF: #1, 30 to 24; #2, 34 to 28. Density: #1, 21% to 26%; #2, 19% to 25%.	Increase forage available to livestock from 33 CYLs to 60 CYLs in 15 years.	Over 15 years increase percent composition of desirable species as shown: #1--Bocu from 14% to 19%, Hibe from 14% to 20%. #2--Bocu from 31% to 35%, Bogr from 5% to 11%, Anba from 10% to 15%, Erwr from 5% to 8%.
75	Silverstrike Allotments #5133 and #5143	Improve wildlife habitat by increasing plant density and percent composition of Cebr from trace amounts to 1% in both key areas.	Reduce SSF from 34 to 18 and increase plant density from 8% to 14% in 15 years.	In 15 years increase the forage available to livestock from 62 CYLs to 85 CYLs.	Increase percent composition of desirable species over 15 years as shown: Key area #1--Bocu from 3% to 8%, Boer from 1% to 2%, Bohi from trace to 2%, Erwr from trace to 2%, Cebr from trace to 1%. Area #2--Bocu from 2% to 4%, Bohi from 6% to 8%, Erwr from trace to 3%, Cebr from trace to 1%.
81	Siphon Canyon Allotment #5141	Increase Erwr and Caer from trace to 2% over 15 years.	Maintain erosion class at "slight".	Maintain forage available to livestock at the present level of 8 CYLs.	In key area #1 increase key species over 15 years as follows: Bogr, maintain at 9%, Bocu maintain at 9%. In key area #2--Bogr from trace to 5%, Bocu from trace to 5%.
88	Whitetail Allotment #5150	Increase percent composition of key species and increase total plant density for increased and improved wildlife habitat.	Reduce present SSF from 70 to 60 in 15 years. Increase plant density from 10% to 13% in 15 years.	Increase forage available to livestock from 20 CYLs to 30 CYLs over 15 years.	In 15 years increase key species composition as shown: Himu from trace to 2%, Atca from 2% to 5%.
90	Blue Mountain Allotments #5152, #5153, #5154, #5155, and #5156	Provide habitat for 15 head of mule deer.	Decrease SSF in 15 years as shown: Brushy, 35 to 30; Keating, 60 to 55; Oak, 35 to 30; Harris, 34 to 29; Nippers, 43 to 39; Tobosa, 62 to 58. Increase plant density as shown: Brushy, 12% to 16%; Keating, 10% to 12%; Oak, 18% to 22%; Harris, 22% to 28%; Nippers, 14% to 18%; Tobosa, 11% to 14%.	Increase forage available to livestock from 77 CYLs to 96 CYLs over 15 years.	Increase percent composition in 15 years as follows: Brushy--Bocu from 5% to 10%. Keating--Himu from 5% to 8%, Sema from trace to 8%. Oak--Himu from 75% to 75%, Sema from 1% to 4%. Harris--Bogr from 60% to 65%. Nippers--Bocu from 5% to 10%, Boer from 6% to 11%. Tobosa--Himu from 6% to 10%.
146	Schoenholzer Canyon #4538	Reserve 4 CYLs for mule deer.	Improve SSF and plant density over 15 years as shown: SSF: Little Gust James, 29 to 25; Whitlock, 21 to 19. Plant density: Little Gust James, 14% to 18%; Whitlock, 19% to 22%.	Increase forage available to livestock from 59 CYLs to 80 CYLs in 15 years.	Increase composition of desirable species over 15 years as follows: Little Gust James--Bocu from 11% to 16%, Boro from 3% to 8%, Hibe from 3% to 8%, Caer from 3% to 6% Whitlock--Bocu from 14% to 20%, Boer from 16% to 23%, Boro from 8% to 14%, Hibe from 8% to 14%, Erin from 5% to 11%, Caer from 4% to 7%.
158	Bryce #4608	Reserve 6 CYLs for wildlife species.	Reduce SSF and increase density over 15 years as follows: SSF: Area #1, 35 to 30; #2, 18 to 18; #3, 39 to 35; #4, 29 to 25; #5, 17 to 17. Density: Area #1, 11% to 19%; #2, 20% to 28%; #3, 9% to 11%; #4, 13% to 15%; #5, 8% to 9%.	Produce a sustained yield of forage available to livestock of 100 CYLs over a 15 year period.	Over 15 years increase key species as follows: Area #1--Himu from 18% to 21%, Erwr from trace to 3%, Boer from trace to 5%. Area #2--Himu from 45% to 47%, Erwr from trace to 3%, Bocu from 5% to 10%. Area #3--Himu from trace to 3%, Krpa from trace to 2%. Area #4--Himu from trace to 3%, Krpa from trace to 2%. Area #5--Himu from trace to 3%, Krpa from trace to 2%.
163	Lone Star #4613	Reserve forage for 5 deer per section.	In 15 years SSF in the key areas as shown: #1, 46 to 35; #2, 24 to 18; #3, 17 to 15; #4, 29 to 20; #5, 19 to 15.	Maintain a sustained yield of forage available to livestock at 148 CYLs.	Increase percent composition of desirable species over 15 years as shown: #1--Himu from 4% to 6%, Boer from trace to 2%, Bocu from trace to 2%. #2--Himu from 8% to 10%. #3--Himu from 3% to 6%. #4--Himu from 5% to 8%. #5--Himu from 2% to 4%, Boer from trace to 8%, Bocu from trace to 2%, Trca from trace to 1%, Sich from 7% to 10%.
167	Bullgap Community #4617	Provide forage for 25 head of mule deer.	In 15 years reduce SSF as shown: Headquarters, 23 to 20; Bill Canyon, 24 to 21; Cat Canyon, 25 to 21. In 15 years increase plant density as shown: Headquarters, 17% to 20%; Bill Canyon, 20% to 22%; Cat Canyon, 10% to 14%.	Increase forage available to livestock in 15 years from 88 CYLs to 120 CYLs.	Increase composition of key species over 15 years as shown: Headquarters--Bocu from 15% to 23%. Bill Canyon--Bocu from 18% to 27%. Cat Canyon--Himu from 5% to 10%.
180	Black Rock #4630	Reserve 5 CYLs for wildlife habitat.	Over 15 years decrease SSF from 42 to 30.	Increase forage available to livestock from 18 CYLs to 38 CYLs in 15 years.	Increase percent composition of desirable species over 15 years as shown: Boer from trace to 10%, Bocu from trace to 5%, Erwr from trace to 2%, Cefe from trace to 3%.
181	Spenazuma #4630	Reserve food for 5 deer per section.	Over 15 years reduce SSF from 27 to 20. In 15 years increase grass cover from 9% to 20%.	Increase forage available to livestock from 20 CYLs to 30 CYLs in 15 years.	Increase composition of desirable species over 15 years as shown: Area #1--Bocu from 1% to 5%, Erwr from 6% to 10%. Area #2--Hibe from 5% to 9%, Boer from trace to 3%, Sich from trace to 3%. Area #3--Hibe from 6% to 8%, Bohi from 1% to 3%, Boer from trace to 2%, Bocu from 6% to 10%, Sich from trace to 3%.
182	Holdup Canyon #4632 and #4648	Reserve enough feed for 5 deer per section.	Over 15 years reduce SSF from 28 to 20. Increase grass cover from 7% to 15% in 15 years.	Increase forage available to livestock from 408 CYLs to 516 CYLs in 15 years.	Increase percentage composition of desirable species over 15 years as follows: Area #1--Bocu from trace to 5%, Hibe from 7% to 10%, Sich from trace to 3%.

APPENDIX C (cont.)

Resource Objectives for Grazing Units Under a Proposed Deferred-Rotation Grazing System

GRAZING UNIT NO.	ALLOTMENT NAME AND NO.	WILDLIFE HABITAT	WATERSHED PROTECTION	LIVESTOCK PRODUCTION ON PUBLIC LANDS	VEGETATION (KEY SPECIES)
7	Gila Allotments #5010, #5011, and #5014	Establish 40 to 50 cottonwood trees per quarter mile for wildlife cover.		Maintain forage available to livestock at the present level of 318 CYLs.	
43	Lazy "B" Allotment #5058	Provide feed for 180 to 200 deer, and 25 to 30 antelope.	Increase plant density and SSF over 15 years as follows: Plant density: Bobcat, 8% to 25%; Lostlake, 14% to 21%; Big Tank, 10% to 20%; Pearson, 17% to 25%; Z/L, 14% to 18%; 3 Mills, 16% to 23%; High Lonesome, 5% to 18%. Reduce SSF as follows: Bobcat, 30 to 20; Lostlake, 31 to 25; Big Tank, 30 to 20; East, 43 to 25; Pearson, 37 to 31; Z/L, 64 to 62; 3 Mills, 14 to 14; High Lonesome, 28 to 20.	Maintain present level of forage available to livestock at 2,600 CYLs.	Increase composition of key species over 15 years as follows: Bobcat--Himu from 74% to 85%. East--Himu from 70% to 80%, Spai from 10% to 20%. Pearson--Boer from 41% to 45%, Himu from 35% to 38%. Z/L--Spcr from 7% to 12%. 3 Mills--Boer from trace to 10%, Himu from 70% to 82%, Spcr from 6% to 10%, Eula from trace to 3%. High Lonesome--Himu, maintain at 100%.
60	Midway Canyon Allotment #5116	COORDINATED AMP SCS took the lead in writing this plan; no objectives were stated.			
139	Holy Joe #4531	Increase wildlife habitat by increasing plant density and composition of desirable plant species.	Reduce SSF in 15 years from 33 to 23.	Increase forage available to livestock from 5 CYLs to 13 CYLs in 15 years.	Sich has been selected as a key species for this allotment.
148	Y.L.E. #4540	COORDINATED AMP SCS took the lead in writing this plan; no objectives were stated.			
152	Tom Springs #4602	To provide habitat for 5 deer per section.	Over 15 years reduce SSF and increase plant density as shown: SSF: Carland Wash, 25 to 22; Day Mine, 35 to 25; Headquarters, 31 to 28; Porter Wash, 31 to 28. Density: Carland Wash, 23% to 27%; Day Mine, 22% to 26%; Headquarters, 24% to 28%; Porter Wash, 9% to 13%.	Over 15 years increase forage available to livestock from 63 CYLs to 100 CYLs.	Over 15 years increase percent composition of desirable species as follows: Carland Wash--Himu from 15% to 18%, Bocu from 9% to 12%, Boer from 4% to 7%, Hibe from 5% to 9%. Day Mine--Hibe from 9% to 12%, Bocu from 18% to 21%, Boer from 5% to 9%. Porter Wash--Himu from 42% to 44%, Bocu from 4% to 9%.
165	Johnny Creek #4615	Provide forage for 60 deer and 50 javelina.	Increase vegetation density from 20% to 25% over 15 years.	Maintain forage available to livestock at the current level of 284 CYLs.	Key species are: Lone Star--Bocu, Hibe, and Himu. Ben Hur--Hibe, Boer, Bocu. Talley Spring--Bocu, Boer, Hibe. Johnny Spring--Himu, Bocu, Boer. Farrell Mountain--Hibe, Bocu, Boer. Chiquito--Himu, Hibe, Bocu. West--Bocu, Boer, Hibe. See watershed objective.
166	Bonita Creek #4616	Increase deer population from 25 to 35 head.	Increase plant density from 14% to 18% over 15 years.	Increase forage available to livestock from 385 CYLs to 474 CYLs in 15 years.	Key species by pasture: Unit #1--Bocu. Hackberry Spring--Bocu. Jones Place--Bocu. Blue Rock--Boer. Weaning--Bocu. Dry Canyon--Boer. Spring Canyon--Boer. Home Range--Himu. See watershed objective.

APPENDIX C (cont.)

Resource Objectives for Grazing Units Under a Proposed Seasonal Grazing System

GRAZING UNIT NO.	ALLOTMENT NAME AND NO.	WILDLIFE HABITAT	WATERSHED PROTECTION	LIVESTOCK PRODUCTION ON PUBLIC LANDS	VEGETATION (KEY SPECIES)
3	Slash Hook #5003	COORDINATED AMP SCS took the lead in writing this plan; no objectives were stated.			
4	Hickey #5004	COORDINATED AMP Forest Service took the lead in writing this plan; no objectives were stated.			
15	Apache Creek Allotment #5020	Increase mule deer habitat by increasing composition of Cebr from 7% to 9%.	In 15 years decrease the SSF from 34 to 29. Also in 15 years increase plant density from 18% to 21%.	Maintain present level of forage available to livestock at the present level of 12 CYLs.	Increase composition of Bocu from 19% to 22% over 15 years. Increase composition of Bohi from 17% to 20% in 15 years. Increase composition of Cebr from 7% to 9% in 15 years.
49	Chimney Allotment #5104	Monitor use of Erwr and Atca to determine deer-livestock competition. Increase ground cover for ground nesting birds and small mammals.	In 15 years reduce SSF in Soapweed Pasture from 45 to 35 and increase plant density from 17% to 25%.	Maintain present level of forage available to livestock at 55 CYLs.	Increase key species over 15 years as follows: Soapweed Pasture--Boer from 12% to 15%, Himu from 12% to 15%, and Bocu from trace to 5%.
52	Stockton Pass Allotment #5107	Stock proper numbers of cattle to minimize competition between wildlife and livestock.	Improve the SSF and increase plant density in 15 years as follows: SSF: Argon, 40 to 35; Big Hollow, 42 to 36; Brahma, 48 to 39. Plant density: Argon, 22% to 27%; Big Hollow, 10% to 42%; Brahma, 8% to 15%.	Maintain forage available to livestock at the present level of 78 cows for 6 months.	In 15 years increase the key species as follows: Argon--Himu from trace to 3%, Mupo from trace to 2%. Big Hollow--Himu from 50% to 55%, Boer from trace to 8%. Brahma--Himu from 13% to 25%, Mupo from trace to 5%.
58	Fan Allotment #5114	Improve habitat by increasing plant density and percent composition of key species.	In 15 years reduce SSF as follows: Creosote, 55 to 54; Zeolite, 40 to 36; Channel, 18 to 16; Fan, Johnson Grass, 18 to 16. In 15 years increase plant density as follows: Creosote, 17% to 20%; Zeolite, 20% to 25%. Maintain present densities in Channel, Fan, and Johnson Grass pastures.	Increase forage available to livestock from 81 CYLs to 100 CYLs in 15 years.	Key species by pasture are: Creosote--Spai. Zeolite--Spai, Atca. Channel--Paob.
69	Roostercomb Allotment #5125	Increase deer habitat by increasing the density of Erwr from trace to 2% over 15 years.	Reduce SSF over 15 years as follows: Lyle, 44 to 36; Roostercomb, 43 to 38; McPeters, 32 to 30.	Increase forage available to livestock from 85 CYLs to 100 CYLs in 15 years.	Increase key species over 15 years as follows: Lyle--Boer from 3% to 5%, Hibe from 1% to 3%, Himu from 1% to 5%. Roostercomb--Himu from 3% to 5%, Boer from 2% to 4%, Bocu from trace to 1%. McPeters--Himu from 14% to 17%, Mupo from 1% to 2%.
71	Cedar Spring Allotment #5127	Make all waters available to wildlife.	In 15 years reduce SSF in lower areas from 33 to 30 and from 20 to 18 in the upper areas.	Maintain forage available to livestock at the level of 43 CYLs.	Increase density of key species over 15 years as follows: Muckhog Spring--Bocu from 8% to 12%. Cedar Spring--Bocu from 1% to 6%.
78	Oil Well Allotment #5136	Increase percent composition of desirable plant species for increased forage and cover.	Reduce SSF over 15 years as follows: West, 58 to 53; Central, 45 to 42; Northeast, 32 to 27.	Maintain forage available to livestock at level of 13 CYLs.	Increase percent composition of desirable plant species over 15 years as follows: West--Himu from trace to 2%, Atca from 1% to 2%. Central--Mupo from trace to 2%, Atca from 1% to 2%. Central--Mupo from trace to 1%, Atca from trace to 1%. Northeast--Trmu from 5% to 7%.
80	Ivanhoe Allotments #5139 and #5140	Maintain present density of forage in all deer ranges.	Reduce SSF over 15 years as follows: Uplands, 22 to 20; Lowlands, 40 to 35.	Maintain forage available to livestock at level of 72 CYLs.	Increase percent composition of key species over 15 years as follows: Foster--Bocu from 7% to 11%. Hurtado--Bocu from 2% to 7%.
83	Apache Springs Allotment #5144	Provide habitat for 80 head of mule deer.	Decrease SSF in 15 years as shown: Key area #1, 30 to 25; Key area #2, 35 to 30. In 15 years increase plant density as shown: Key area #1, 15% to 19%; Key area #2, 14% to 18%.	Maintain forage available to livestock at the current level of 100 CYLs.	In 15 years increase the percent composition of the key species as shown: Key area #1--Bocu from 10% to 15%. Key area #2--Bogr from 5% to 10%.
85	Saltbush Allotment #5146	Maintain high quality forage and habitat.	Improve and maintain soil stability.	Increase forage available to livestock from 8 CYLs to 9 CYLs in 15 years.	The key species to be managed for is Atca.
91	Midway Allotment #5157	COORDINATED AMP SCS took the lead in writing this plan; no objectives were stated.			
117	Dripping Springs #4507	Reserve 17 CYLs for wildlife habitat.	Over 15 years decrease SSF as shown: #1, 22 to 20; #2, 25 to 23; #3, 21 to 19. Over 15 years increase plant density as shown: #1, 16% to 24%; #2, 12% to 20%; #3, 26% to 30%.	Over 15 years maintain a level of forage available to livestock at 108 CYLs.	Increase desirable species over 15 years as follows: #1--Dafo from trace to 10%. #2--Sich from 16% to 20%, Caer from trace to 10%. #3--Sich from 15% to 19%, Caer from 15% to 19%, Bocu from 8% to 12%.
134	Klondyke #4526	Provide forage for 130 mule deer.	In 15 years improve SSF and plant density as follows: SSF: Klondyke, 22 to 19; Buford, 24 to 20; Aravaipa, 37 to 34. Density: Klondyke, 18% to 21%; Buford, 21% to 24%; Aravaipa, 16% to 20%.	Increase forage available to livestock from 249 CYLs to 300 CYLs in 15 years.	In 15 years increase composition of desirable plants as follows: Klondyke--Bohi from 24% to 30%, Bocu from 18% to 23%, Boer from 2% to 8%, Erwr from 22% to 25%. Buford--Bohi from 9% to 15%, Boer from 13% to 18%, Bocu from 7% to 14%. Aravaipa--Bocu from 8% to 12%, Hibe from 8% to 10%.
145	Copper Creek #4537	COORDINATED AMP SCS took lead in writing this plan; no objectives were stated.			
151	Diamond Bar #4601	Provide forage for 60 deer and 45 javelina.	Increase ground cover from 20% to 25% over 15 years.	Maintain forage available to livestock at the current 400-CYL level.	Key species are as follows: Sams--Bocu and Hibe. Diamond--Bocu and Hibe. McKinne--Hibe, Himu, Bocu. Dutch--Bocu and Hibe. Lower Fishhook--Bocu, Hibe, Sich. Upper Fishhook--Bocu. North--Himu. Middle--Himu. South--Bocu, Himu. See watershed objective.

Resource Objectives for Grazing Units Under a Proposed Yearlong Grazing System

GRAZING UNIT NO.	ALLOTMENT NAME AND NO.	WILDLIFE HABITAT	WATERSHED PROTECTION	LIVESTOCK PRODUCTION ON PUBLIC LANDS	VEGETATION (KEY SPECIES)
2	San Francisco #5003	Increase the percent composition of Sich from 3% to 8% for deer browse and increase percent composition of Caer from 4% to 9% for mule deer browse.	Increase vegetation density in northern pasture from 24% to 30% in 15 years. Maintain vegetation density in southern pasture at 30%. Reduce SSF in northern pasture from 24 to 21 in 15 years.	Increase forage avaiable to livestock from 32 CYLs to 50 CYLs in 15 years.	At higher elevations raise Sich from 2% to 5% and Bocu from 4% to 10% in 15 years. At lower elevations increase Sich from 4% to 6%, Caer from 7% to 10%, Anba from 6% to 9% in 15 years.
5	Limestone #5005 and #5009	Increase percent composition of Caer from trace to 2% for wildlife forage in 15 years.	Maintain SSF of Mulligan Peak unit at 18. Increase vegetation density in key area #1 from 21% to 27% in 15 years. Increase vegetation density in key area #2 from 18% to 24% in 15 years.	Increase forage available to livestock from 50 CYLs to 60 CYLs in 15 years.	Increase percent composition of Boer in key areas 1 and 2 from the present trace to 4% in 15 years.
6	Wilcross #5007 #5008	In 15 years increase composition of Cegr in middle and east key areas from trace to 5% for mule deer habitat.	Reduce SSF in west pasture from 48 to 43 in 15 years. Reduce SSF in middle pasture from 25 to 20 in 15 years. Reduce SSF in east pasture from 21 to 20 in 15 years. Increase present percent plant density in west pasture from 19% to 25% in 15 years. Increase plant density in middle pasture from 18% in 25% in 15 years. Increase plant density in east pasture from 21% to 27% in 15 years.	Increase forage available to livestock from 105 CYLs to 125 CYLs in 15 years.	Increase percent composition of Bocu in west pasture from 5% to 15%, and in middle and east pastures from trace to 10% in 15 years.
13	Twin Peaks Allotment #5018	Increase wildlife for small game by increasing plant density from 27% to 34% in key area #1 and from 24% to 31% in key area #2 in 15 years.	Increase plant density in key area #1 from 27% to 34% and in key area #2 from 24% to 31% in 15 years.	Maintain present level of forage available to livestock at the present capacity of 84 CYLs.	In 15 years increase percent composition of Boer from 3% to 12% in area #1 and from trace to 10% in area #2. In 15 years increase percentage composition of Bocu in area #1 from trace to 10% and from 4% to 13% in area #2. In 15 years increase Cegr from 16% to 20% and Bohi from trace to 10%.
22	Summit Community Allotments #5028 and #5029	Increase mule deer habitat to provide feed and cover for 50 deer yearlong by increasing percent composition of Cebr from 7% to 9% in 15 years.	In 15 years decrease present SSF from 38 in Apache Box pasture to 34; from 34 in Crookson pasture to 30; and increase plant density from 12% to 16% in Apache Box and from 14% to 18% in Crookson.	Increase forage available to livestock from 112 CYLs to 150 CYLs in 15 years.	In Apache Box pasture increase present composition of Bocu from 15% to 18%, Hibe from 46% to 50%, and Sihy from 4% to 8% in 15 years. In Crookson pasture increase Bocu from 19% to 23%, Bohi from 17% to 22%, and Cebr from 7% to 9% in 15 years.
31	Crôom Allotments #5039 and #5040	Provide food and cover for 25 mule deer.	Decrease SSF from 45 to 40 in 15 years. Increase plant density by 3% in 15 years.	Increase forage available to livestock from 34 CYLs to 55 CYLs in 15 years.	Key species for allotment are Bocu, Boer, and Bohi. See watershed objective.
34	Charlie Hill Allotment #5045	Provide enough feed for 10 mule deer.	Decrease present SSF of 38 to 33 over 15 years. Increase present plant density from 12% to 18% in 15 years.	Increase forage available to livestock from 20 CYLs to 40 CYLs in 15 years.	The key species is Bocu. See watershed objective.
36	Carlisle Allotment #5048	Provide forage and cover for an estimated 125 mule deer on the allotment.	In 15 years increase plant density as follows: Carlisle, 15% to 18%; Barney, 10% to 12%; Pablos, 11% to 13%; Cotton, 9% to 10%; Rimrock, 12% to 14%; Virden, 8% to 9%. Reduce SSF in 15 years as follows: Carlisle, 31 to 25; Barney, 48 to 41; Pablos, 51 to 47; Cotton, 48 to 45; Rimrock, 44 to 41, Virden, 55 to 53.	Increase forage available to livestock from 206 CYLs to 300 CYLs in 15 years.	In Carlisle pasture increase present composition of Bocu from 20% to 23%, Boer from 1% to 3%, Bohi from 1% to 2%. In Barney pasture increase Bocu from 15% to 18%, Boer from 3% to 5%. In Pablos pasture increase Himu from 29% to 30%, Boer from 2% to 5%. In Cotton pasture increase Himu from 10% to 12%, Boer from 1% to 3%. In Rimrock pasture increase Bocu from 7% to 10%, Boer from 6% to 8%, Hibe from 6% to 9%. In Virden pasture increase Himu from 5% to 6%.
56	Poppy Canyon Allotment #5111	Reserve area along eastern boundary for exclusive use by deer and javelina. Increase percent composition of Erwr from trace to 4% in 15 years.	Reduce SSF over 15 years as follows: Poppy Canyon, 38 to 30; Delaney Well, 48 to 39. Increase plant density as follows: Poppy Canyon, 7% to 12%; Delaney Well, 8% to 11%.	Increase forage available to livestock from 43 CYLs to 60 CYLs in 15 years.	Increase key species as follows over 15 years: Poppy Canyon--Himu from 42% to 50%, Hibe from trace to 5%, Trca from trace to 5%. Delaney Wells--Himu from 50% to 60%, Boer from trace to 3%.
72	Dos Cabezas Community Allotments #5128, #5129, and #5130	Provide food and cover for 65 head of mule deer.	In 15 years decrease the SSF as follows: Key area #1, 37 to 28; Key area #2, 45 to 38. In 15 years increase plant density as follows: Key area #2, 8% to 12%.	In 15 years increase forage available to livestock from 58 CYLs to 75 CYLs.	In 15 years increase percent composition of desirable plant species as follows: Key area #1--Bogr from 13% to 17%, Bocu from 7% to 10%, Erwr from 3% to 8%, Cebr from 20% to 24%. Key Area #2--Bocu from 26% to 30%, Hibe from 5% to 9%, Anba from 1% to 5%.

Resource Objectives for Grazing Units Under a Proposed Yearlong Grazing System

GRAZING UNIT NO.	ALLOTMENT NAME AND NO.	WILDLIFE HABITAT	WATERSHED PROTECTION	LIVESTOCK PRODUCTION ON PUBLIC LANDS	VEGETATION (KEY SPECIES)
73	Rough Mountain Allotment #5131	Improve deer habitat by increasing Erwr from trace amounts to 2% in 15 years.	Reduce SSF over 15 years as follows: Area #1, 26 to 22; #2, 24 to 21; #3, 63 to 55.	Maintain forage available to livestock at 44 CYLs.	Increase percent composition of Bocu over 15 years as follows: Area #1--from 2% to 5%. Area #2--from 11% to 14%.
74	Happy Camp Allotment #5132	Realize not more than 40% use on desirable species, to improve Montezuma quail habitat requirements.	In 15 years reduce SSF from 28 to 24.	In 15 years increase forage available to livestock from 6 CYLs to 15 CYLs.	Increase present composition of Bocu from 8% to 12% in 15 years.
114	El Capitan #4505	Maintain enough feed to provide for 7 deer and 10 javelina.	Increase plant density from 12% to 15% over 15 years.	Increase forage available to livestock from 15 CYLs to 20 CYLs over 15 years.	Key species in both upper and lower pastures are Bocu and Sich. See watershed objective.
118	Limestone #4508	Support present wildlife populations of 25 deer, 30 javelina, and 120 quail.	Over 15 years, increase plant density from 14% to 18% and reduce SSF from 31 to 25.	Increase forage available to livestock from 30 CYLs to 35 CYLs over 15 years.	Key species are Sich and Bocu. See watershed objective.
119	Mescal Mountain #4509	Support 5 deer per section.	Increase plant density from 35% to 40% in Area #1 and from 19% to 21% in Area #2 in 15 years.	Maintain forage available to livestock at 72 CYLs.	Increase key species over 15 years as shown: Bocu from 8% to 15%, Sich from 20% to 25%, Cegr from 15% to 20%, Cebr from 8% to 15%.
120	Hook and Line #4510	Reserve 8 CYLs for wildlife species.	Over 15 years reduce SSF and increase plant density as follows: SSF: Key area #1, 38 to 35; Area #2, 30 to 25. Plant Density: Area #1, 3% to 15%; Area #2, 22% to 27%.	Maintain forage available to livestock at the level of 28 CYLs.	In 15 years increase desirable species as follows: Area #1--Cyda from trace to 20%. Area #2--Hibe from 23% to 25%, Sich from 14% to 17%, Caer from trace to 10%.
121	Christmas #4511	Provide habitat for 20 mule deer and 25 javelina.	In 15 years reduce SSF as follows: High elevations, 28 to 25; Low elevations, maintain at 21. In 15 years increase plant density from 15% to 18%.	Maintain forage available to livestock at the level of 39 CYLs.	In 15 years increase desirable species as follows: High elevations--Krpa, Bocu, Caer, and Sich from 17% to 25% total. Lower elevations--Sich, Bocu, and Krpa from trace to 5% total.
123	Hidalgo #4513	Provide habitat for 40 mule deer and 50 javelina.	Maintain SSF as follows: Western, 24; Eastern, 28; Gila, 26. In 15 years increase plant density as follows: Western, 17% to 19%; Eastern, 13% to 15%.	Maintain forage available to livestock at the level of 96 CYLs.	Increase percent composition of desirable species over 15 years as follows: Western--Boer + Caer + Sich = 5%. Increase to 10%. Eastern--Sich + Erfa + Bocu = 68%. Increase to 75%.
130	Aravaipa #4521 and #4522	Reserve 19 CYLs for wildlife habitat.	Increase plant density and reduce SSF over 15 years as shown: Key areas 1 and 4 do not have any transects yet. Key area #2: SSF: 37 to 30. Plant density: 6% to 11%. Key area #3: SSF: 32 to 26. Plant density: 10% to 19%.	Maintain forage available to livestock at 111 CYLs.	In 15 years increase density of key species as follows: #2--Caer from trace to 4%, Boer from 16% to 21%, Cegr from trace to 4%, Erwr from trace to 4%. #3--Caer from trace to 4%, Bohi from trace to 9%, Cegr from trace to 4%, Erwr from 9% to 13%.
132	Horse Mountain #4524		Maintain the present slight to moderate classification.	Maintain forage available to livestock at 23 CYLs.	
135	Squaw Creek #4527	Improve wildlife by increasing plant density and percent composition of desirable plant species.	In 15 years improve SSF and plant density as follows: SSF: #1, 26 to 22; #2, 28 to 23; #3, 28 to 22. Density: #1, 14% to 18%; #2, 17% to 22%; #3, 23% to 27%.	Increase forage available to livestock from 64 CYLs to 90 CYLs in 15 years.	Increase desirable plant density over 15 years as follows: Area #1--Hibe from 6% to 8%, Bocu from 3% to 5%, Himu from 3% to 6%, Hibe from 11% to 13%. Area #3--Bocu from 16% to 19%, Bohi from 8% to 11%, Boer from 4% to 7%, Hibe from 8% to 12%.
164	Sanchez #4614	Increase ground cover for birds and small game.	Reduce SSF from 21 to 20 in 15 years and increase plant density from 12% to 16% in 15 years.	Maintain forage available to livestock at 12 CYLs over 15 years.	Increase key species in 15 years as shown: Himu from 50% to 60%, Lyph from trace to 5%.
168	Turtle Mountain #4618	Reserve 10 CYLs for mule deer habitat.	In 15 years improve SSF and plant density as follows: SSF: #1, 17 to 15; #2, 22 to 20; #3, 14 to 12; #4, 33 to 28; #5, 13 to 11. Density: #1, 17% to 20%; #2, 13% to 16%; #3, 18% to 21%; #4, 11% to 14%; #5, 20% to 23%.	Increase forage available to livestock in 15 years from 195 CYLs to 205 CYLs.	In 15 years increase percent composition of key species as shown: #1--Bocu from 24% to 28%, Boer from 12% to 15%. #2--Bocu from 15% to 18%, Hibe from 23% to 25%, Boer from 15% to 18%. #3--Himu from 33% to 35%, Hibe and Bocu from 17% to 20%, Bogr from 11% to 15%. #4--Bocu from 9% to 12%, Boer from 10% to 13%, Hibe from 18% to 21%. #5--Bogr and Bocu from 25% to 27%, Boer from 5% to 8%, Hibe from 15% to 18%, Himu from 10% to 13%.
183	Jackson Mountain #4633	Maintain 6 CYLs for wildlife use.	Improve SSF and plant density in 15 years as follows: Density: 3% to to 15%. SSF: Area #1, 48 to 35; Area #2, 29 to 20.	Increase forage available to livestock from 36 CYLs to 56 CYLs in 15 years.	Improve desirable species as follows: Area #1--Bocu from 1% to 5%, Boer from trace to 5%, Erwr from trace to 3%, Caer from 1% to 3%. Area #2--Bocu from 3% to 10%, Sihy from 1% to 2%, Boer from trace to 8%, Erwr from trace to 3%, Caer from 2% 5%.

APPENDIX D
PROPOSED RANGE IMPROVEMENTS ASSOCIATED WITH PROPOSED AMPS

		PUBLIC LANDS							OTHER LANDS						
No.	Allotments Name	Fence (Miles)	No. of Reser-voirs	Pipe-line (Miles)	No. of Water Troughs	No. of Storage Tanks	No. of Wells	No. of Catch-ments	Fence (Miles)	No. of Reser-voirs	Pipe-line (Miles)	No. of Water Troughs	No. of Storage Tanks	No. of Wells	Remarks
2	San Francisco	3.0	---	---	---	---	---	---	---	---	---	---	---	---	
5	Limestone Canyon	---	---	---	---	---	---	---	---	2	1.8	3	1	---	27,000 gal. storage tank 2,000 cu. yd. reservoirs
6	Willcross	.2	---	---	---	---	---	---	---	---	---	---	---	---	
8	Clifton	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
9	Airport	1.0	---	---	---	---	---	---	3.3	---	---	---	---	---	
12	Hoverrocker	.6	---	---	---	---	---	---	2.4	1	.2	1	---	---	2,000 cu. yd. reservoir 1 spring development on private land
13	Twin Peaks	---	---	---	---	---	---	---	---	---	---	1	---	1	
14	Combine	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvement
15	Apache Creek	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvement
16	Black Canyon	4.5	---	3.8	3	3	---	---	0.5	---	---	---	---	---	25,000 gallon storage tank
17	County Line	2.4	---	9.5	10	10	---	---	---	---	---	---	---	---	2-50,000 gallon storage tanks 7-35,000 gallon storage tanks 1-25,000 gallon
18	Buck Canyon	1.7	---	7.0	5	5	---	---	---	---	---	---	---	---	1-50,000 gallon storage tank 4-25,000 gallon storage tank
19	Harper	4.9	---	7.5	6	2	---	---	.4	---	1.5	1	---	---	25,000 gallon storage tank
21	Web	2.5	---	---	---	---	---	---	---	---	---	---	---	---	
22	Summit Community	---	---	---	---	---	---	---	---	---	--	---	---	---	No improvements
26	Tollgate	2.3	---	9.1	9	4	---	1	---	---	1.5	---	---	---	Catchment storage 30,000 gal. 4-15,000 gal. storage tanks
27	Guthrie Peak	1.3	---	2.0	3	---	---	---	---	---	4.7	1	1	---	150,000 gallon storage tank
28	Sheldon Mountain	---	---	4.2	3	3	---	---	---	---	.3	---	---	---	25,000 gallon storage tank
30	China Camp	2.4	---	9.5	8	---	---	---	---	---	---	---	---	---	
31	Croom	---	---	---	---	---	---	---	---	---	1.0	2	---	---	
32	Rhyolite Peak	2.0	---	2.8	1	---	---	---	0.5	---	.5	1	---	---	
34	Charlie Hill	---	---	2.0	3	1	---	---	---	---	.1	---	1	---	10,000 gallon storage tanks
36	Carlisle	3.5	1	4.1	3	2	---	---	1.9	---	.5	---	---	---	10,000 gallon storage tanks 3,000 cu. yd. reservoir
43	Lazy "B"	11.0	3	2.0	4	1	---	2	---	1	.5	---	---	---	5.0 miles of antelope fence 3,000 cu. yd. reservoirs 25,000 gallon storage tank 1,400 cu. yd. spreader dam on public lands
44	Horseshoe	1.7	---	7.9	---	6	---	---	---	---	1.6	---	2	---	25,000 gallon storage tanks
45	Little Doubtful	---	---	---	---	---	---	---	.6	---	1.5	2	2	---	25,000 gallon storage tanks
48	Hackberry	17.0	---	1.4	2	2	---	---	4.5	---	1.6	---	---	---	10,000 gallon storage tanks
49	Chimney	1.0	---	.2	1	1	---	---	1.0	---	1.1	---	---	---	15,000 gallon storage tank
52	Stockton Pass	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
54	Van Gausig	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
55	Badger Den	---	---	4.6	4	---	---	---	---	---	---	---	---	---	
56	Poppy Canyon	---	---	---	---	---	---	---	---	---	---	---	---	1	
57	Fisher	5.0	---	3.6	2	2	---	---	8.0	---	2.0	---	---	---	10,000 gallon storage tanks
58	Fan	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
63	Flying "W"	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
69	Rooster Comb	2.5	---	---	---	---	1	---	3.3	---	1.3	1	---	---	
71	Cedar Spring	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
72	Dos Cabezas Community	.3	---	---	---	---	---	---	---	---	---	---	---	---	

No.	Allotments Name	PUBLIC LANDS Fence (Miles)	No. of Reser- voirs	Pipe- line (Miles)	No. of Water Troughs	No. of Storage Tanks	No. of Wells	No. of Catch- ments	OTHER LANDS Fence (Miles)	No. of Reser- voirs	Pipe- line (Miles)	No. of Water Troughs	No. of Storage Tanks	No. of Wells	Remarks
73	Rough Mountain	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
74	Happy Camp	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
75	Silver Strike Community	.4	---	---	---	1	---	---	.2	---	---	---	---	---	30,000 gallon storage tank
78	Oil Well	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
80	Ivanhoe	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
81	Siphon Canyon	.3	---	---	---	---	---	---	1.5	---	---	---	---	---	
83	Apache Springs	---	---	---	1	---	---	1	---	---	---	---	---	---	Catchment storage 25,000 gal.
85	Saltbush	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
88	Whitetail	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
90	Blue Mountain	---	---	2.8	2	---	---	---	---	---	---	---	---	---	
114	El Capitan	0.4	---	0.6	---	---	---	---	0.3	---	---	---	---	---	
117	Dripping Springs	5.2	2	---	1	---	---	---	0.6	---	---	---	---	---	3,000 cu. yd. reservoirs
118	Limestone	---	---	0.6	2	1	1	---	---	---	---	---	---	---	10,000 gallon storage tank Well casing 200 feet
119	Mescal Mountain	5.3	---	---	---	---	---	1	---	---	---	---	---	---	Catchment storage 35,000 gal.
120	Hook and Line	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
121	Christmas	1.5	---	---	---	---	---	---	---	---	---	---	---	---	
123	Hidalgo	4.0	---	---	---	---	---	---	---	---	---	---	---	---	
130	Aravaipa	5.5	---	.8	2	---	---	1	0.5	---	0.5	---	---	---	Catchment storage 50,000 gal. 1 corral and 2 spring development on public lands
132	Horse Mountain	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
134	Klondyke	2.5	1	---	---	---	---	---	---	---	---	---	---	---	4,000 cu. yd. reservoir
135	Squaw Creek	---	---	1.4	1	---	---	---	---	---	---	---	---	---	
139	Holy Joe	---	---	2.2	3	3	---	---	---	---	0.4	---	---	---	10,000 gallons storage tanks
146	Schoenholzer Canyon	4.5	---	2.9	2	1	---	---	1.0	---	0.6	---	---	---	30,000 gallon storage tank
152	Tom Springs	1.7	---	1.0	3	3	---	---	---	---	---	---	---	---	1-27,000 gallon storage tank 2-30,000 gallon storage tanks
158	Bryce	5.3	---	---	---	---	---	---	6.0	---	3.0	---	---	---	
163	Lone Star	---	---	10.8	12	3	---	---	---	---	2.7	1	---	---	1-50,000 gallon storage tank 2-30,000 gallon storage tanks
164	Sanchez	---	---	---	---	---	---	---	---	---	---	---	---	---	No improvements
167	Bullgap Community	5.0	---	2.5	3	---	---	1	---	---	---	---	---	---	Catchment storage 50,000 gal.
168	Turtle Mountain	---	---	---	---	---	---	1	---	---	---	---	---	---	Catchment storage 30,000 gal.
180	Black Rock	---	---	0.1	2	2	---	---	---	---	---	---	---	---	1-10,000 gallon storage tank 1-50,000 gallon storage tank 1-masonry diverter, 3 cu. yd, on public lands
181	Spenazuma	1.6	---	0.4	4	---	---	---	1.2	---	---	---	---	---	1-masonry cutoff 2 cu. yd. and 1-spring development on public lands
182	Holdup Canyon	---	1	0.1	1	2	1	---	---	---	---	---	---	---	4,000 cu. yd. reservoir 1-32,000 gallon storage tank 760' well casing 1-masonry dam, 2 cu. yd. on public lands
183	Jackson Mountain	---	---	---	---	---	---	---	0.8	---	---	---	---	---	
Total		114.0	8	107.4	106	58	3	8	38.5	4	28.9	14	7	2	1-spring development on private lands On public lands 1-dirt spreader dam, 3-spring developments, 3-masonry diverters

APPENDIX E

PRESENT AND POTENTIAL DENSITIES FOR MULE DEER,
JAVELINA, AND WHITE-TAILED DEER,
PER VEGETATION TYPE IN THE ES AREA

Prepared for the Bureau of Land Management by the Arizona Game and Fish Department, 1976.

APPENDIX E

MULE DEER

This table represents the present (1976) and optimum population densities (expressed as animals per square mile) for mule deer. The estimates are for the average of all habitats within each vegetation type. These density estimates were made by the field and staff biologist for the Arizona Game and Fish Department. Areas for which estimates were made appear on the attached map.

AREA	VEGETATION TYPES 1/											
	Chaparral		Desert Grassland		Pinyon-Juniper		Chihuahuan Desertscrub		Sonoran Desertscrub		Madrean Evergreen Woodland	
	P*	O**	P	O	P	O	P	O	P	O	P	O
1	4-5	9-10	2-3	4-5	---	---	---	---	2-3	4-5	---	---
2	4-6	9-10	3-5	6-8	2-3	4-5	---	---	3-5	6-10	---	---
3	---	---	1	2-3	1	2-3	---	---	0.5	0.5-1	---	---
4	---	---	0.5-2	1-5	---	---	---	---	0.2	0.5	3	3
5	---	---	0.5	1-2	0.5	1-2	---	---	0 2/	0 2/	---	---
6	---	---	0.5	0.5-1	---	---	0 2/	0 2/	0 2/	0 2/	---	---
7	---	---	2	6	---	---	0 2/	0 2/	---	---	4-6	9-10

1/ Brown and Lowe (1974a and 1974b).
2/ Primarily season use with isolated population concentrations adjacent to agricultural areas. Much of what is now classed as Sonoran desertscrub and Chihuahuan desertscrub was historically desert grassland (Hastings and Turner, 1965).

P* Present population presented as deer/square mile.
O** Optimum population presented as deer/square mile.

Note: The density of mule deer in riparian habitat is dependent upon the adjacent vegetation type. The edge effect, coupled with the increased availability of forage, water, and cover, is extremely important. The riparian habitat is capable of supporting double the population density of the adjacent habitat.

APPENDIX E (cont.)

WHITE-TAILED DEER

This table represents the present (1976) and optimum population densities (expressed as animals per square mile) for white-tailed deer. The estimates are for the average of all habitats within each vegetation type. These density estimates were made by the field and staff biologist for the Arizona Game and Fish Department. Areas for which estimates were made appear on the attached map.

AREA	VEGETATION TYPES 1/											
	Chaparral		Desert Grassland		Pinyon-Juniper		Chihuahuan Desertscrub		Sonoran Desertscrub		Madrean Evergreen Woodland	
	P*	O**	P	O	P	O	P	O	P	O	P	O
1	2-3	6-7	1-3	4-5	---	---	---	2/---	0-1	2-3	---	---
2	1-2	8-12	1	1-2	1-2	8-12	---	---	0-1	1-2	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	0	0.5	---	---	---	---	---	---	0	1
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	0.4	1	---	---	---	---	---	---	0.4	7-10

1/ Brown and Lowe (1974a and 1974b).
2/ The occurrence of white-tailed deer in Chihuahuan desertscrub is limited to very minor seasonal use.

P* Present population presented as deer/square mile.
O** Optimum population presented as deer/square mile.

APPENDIX E (cont.)

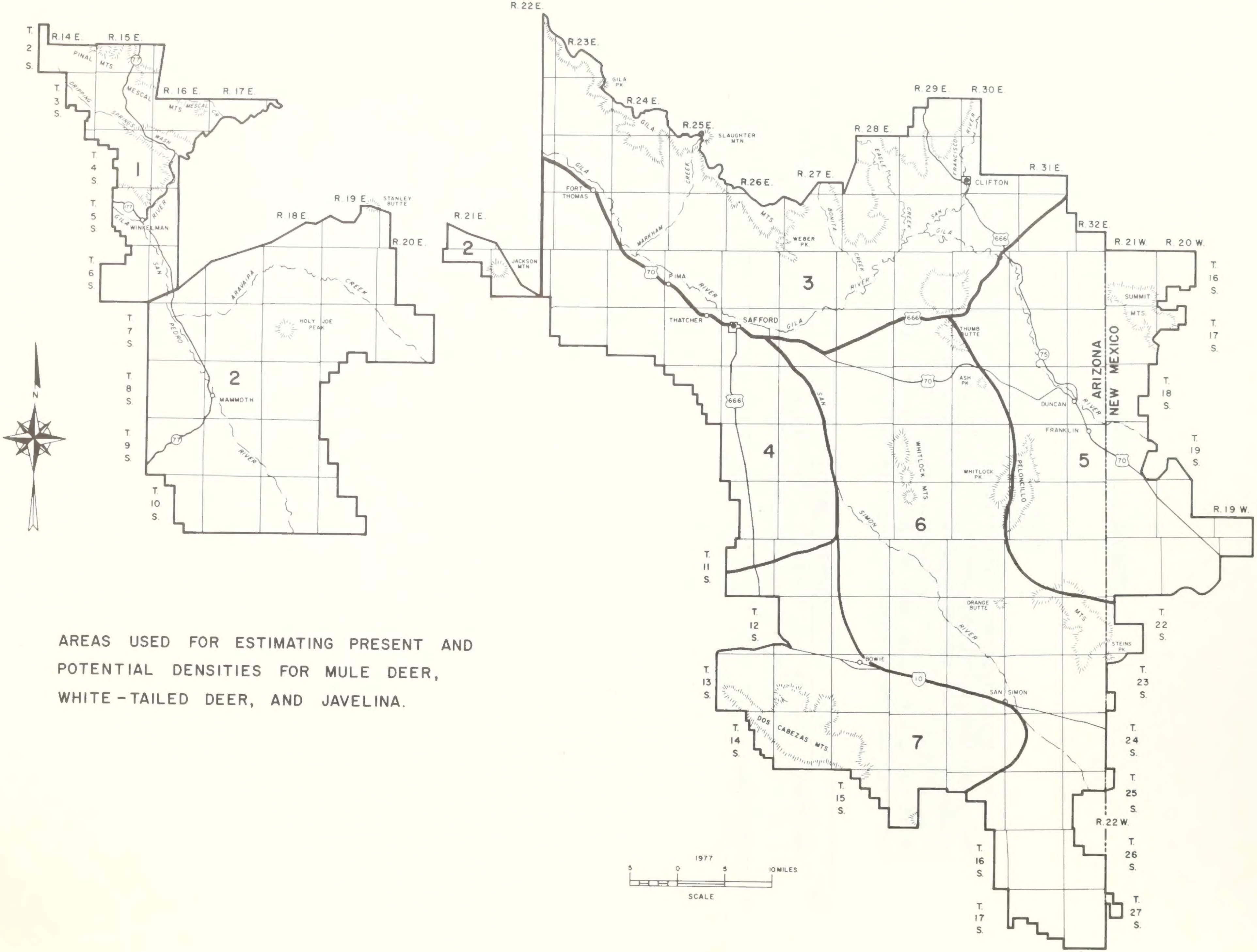
JAVELINA

This table represents the present (1976) and optimum population densities (expressed as animals per square mile) for javelina. The estimates are for the average of all habitats within each vegetation type. These density estimates were made by the field and staff biologist for the Arizona Game and Fish Department. Areas for which estimates were made appear on the attached map.

AREA	VEGETATION TYPES 1/											
	Chaparral		Desert Grassland		Pinyon-Juniper		Chihuahuan Desertscrub		Sonoran Desertscrub		Madrean Evergreen Woodland	
	P*	O**	P	O	P	O	P	O	P	O	P	O
1	2-3	5-7 3/	4-5	5-7	---	---	---	---	3-6	5-7	---	---
2	4-5	5-7 3/	3-5	5-7	3	5	---	---	3-5	5-7	4-5	5-7
3	---	---	0.5	5-7	---	---	---	---	0.5-1	5-7	---	---
4	---	---	0-3	5-7	0 2/	5	0	---	0.50	5-7	2	5-7
5	---	---	0.5	5-7	0 2/	5	0	---	---	---	---	---
6	---	---	0.5	5-7	---	---	0	---	---	---	---	---
7	---	---	0.7	5-7	---	---	0.1	0.2	---	---	5-7	5-7

1/ Brown and Lowe (1974a and 1974b).
2/ Occasional occurrence.
3/ Figures represent optimums for hunted populations; unhunted population maximums could reach 10-14/square mile.

P* Present population presented as javelina/square mile.
O** Optimum population presented as javelina/square mile.



AREAS USED FOR ESTIMATING PRESENT AND POTENTIAL DENSITIES FOR MULE DEER, WHITE-TAILED DEER, AND JAVELINA.

APPENDIX F

KEY FOOD PLANT SPECIES FOR BIG GAME
BY VEGETATION TYPE*
IN THE UPPER GILA-SAN SIMON ES AREA

Species	Common Name	Relative Value
SONORAN DESERTSCRUB (ARIZONA UPLANDS SUBDIVISION)		
Cercidium microphyllum	Foothill Paloverde	Moderate
Cercidium floridum	Blue Paloverde	Low
Prosopis juliflora	Mesquite	Moderate
Acacia spp.	Catclaw, Mescat, etc.	Moderate
Ceanothus greggii	Desert Ceanothus	High
Opuntia spp.	Cactus	High
Lycium spp.	Squawberry	Moderate
Simmondsia chinensis	Coffeeberry	High
Ephedra spp.	Mormon Tea	High
Calliandria eriophylla	False Mesquite	High
Krameria parvifolia	Ratany	High
Menondora scabra	Twinberry	High
Ditaxis sp.	Ditaxis	High
Lotus sp.	Green & Yellow Peas	High
CHIHUAHUAN DESERTSCRUB		
Yucca elata	Yucca	Low
Eurotia lanata	Winterfat	Low
Mimosa sp.	Wait-a-minute	Low
Acacia sp.	Catclaw, Mescat, etc.	Low
Krameria sp.	Ratany	High
Ephedra sp.	Mormon Tea	High
Atriplex canescens	Fourwing Saltbush	High
Calliandria eriophylla	False Mesquite	High
Agave spp.	Agave, lechugilla etc.	Moderate
Foquieria splendens	Ocotillo	Moderate
Opuntia sp.	Cactus	High
GRASSLANDS (PLAINS AND DESERT)		
Sporobolus sp.	Sacaton, dropseed, etc.	Moderate
Trichachne californica	Cottontop	Moderate
Boutelous sp.	Gramma grasses	High
Muhlenbergia porteri	Bush muhly	High
Aristida sp.	Three awn	Low
Hilaria mutica	Tobosa	Low
Acacia sp.	Catclaw, Mescat, etc.	Moderate
Opuntia sp.	Cactus	Moderate
Atriplex canescens	Fourwing Saltbush	High
Juniperus sp.	Juniper	Moderate
Prosopis juliflora	Mesquite	Moderate
Yucca sp.	Yucca	Moderate
Mimosa sp.	Wait-a-minute	Moderate

Species	Common Name	Relative Value
CHAPPARAL		
Lonicera sp.	Honeysuckle	High
Quercus sp.	Oaks	High
Simmondsia chinensis	Coffeeberry	High
Acacis greggii	Catclaw	Low
Mimosa sp.	Wait-a-minute	Low
Ceanothus sp.	Deerbrush	High
Cercocarpus ps.	Mountain mahogany	High
Rhamnus crocea	Hollyleaf buckthorn	Moderate
Arctostaphylos sp.	Manzanita	Moderate
Eriodictyon angustifolium	Yerba-santa	Moderate
Rhus trilobata	Skunk-bush	Moderate
Rhus ovata	Sugar sumac	Low
Berberis fremontii	Algerita	Low
Garrya wrightii	Wright's silktassel	High
Juniperus sp.	Juniper	Moderate
Eriogonom wrightii	Shrubby buckwheat	High
MADREAN EVERGREEN WOODLAND (ENCINAL)		
Cercocarpus sp.	Mountain mahogany	High
Quercus sp.	Oaks	High
Ceanothus sp.	Deerbrush	High
Garrya wrightii	Wright's silktassel	High
Rhamus crocea	Hollyleaf buckthorn	Moderate
Bouteloua sp.	Gramma grasses	High
Juniperus sp.	Juniper	Moderate
Rhamnus californica	Buckthorn	Moderate
Rhus trilobata	Skunk-bush	Moderate
Pinus sp.	Pines	Low
PINYON-JUNIPER WOODLAND		
Berberis fremontii	Algerita	Low
Cowania mexicana	Cliffrose	Moderate
Bouteloua sp.	Gramma grasses	High
Juniperus sp.	Juniper	Moderate
Cercocarpus sp.	Mountain mahogany	High
Quercus sp.	Oaks	High
Pinus sp.	Pinyon pines	Low
Artemesia nova	Black sage	High
Sitanion hystrix	Squirrel tail	Moderate
Garrya wrightii	Wright's silktassel	High
Ephedra sp.	Mormon tea	Moderate

Prepared by Arizona Game and Fish Department, November 1976

*Brown and Lowe (1974a and 1974b)

APPENDIX G

DESCRIPTION OF KNOWN ARCHAEOLOGICAL RESOURCES

Allotment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Ownership Status
1	67	Mimbres Mogollon sherd and lithic scatter on San Francisco River north of Clifton, possible structures. Condition unknown.		C	Private
	68	Mimbres Mogollon village on San Francisco River north of Clifton with two multi-room structures of crude stone and adobe masonry with outside compound wall. Condition unknown.	Yes	C	Private
	169	Mogollon processing site on hilltop east of Clifton containing many basin metate fragments and a scatter of sherds and lithics. Condition fair; disturbed by city water tank and erosion control stone alignments; heavy visitor use from Clifton.		B	Private
2	66	Mogollon village on San Francisco River north of Clifton consisting of a few scattered cobble structures and trash. Condition poor; road cut, extensive digging by vandals, channeling.		C	Public Lands
	258	Small meta-sediment chipping station west of San Francisco River north of Clifton. Condition good; no vandalism, erosion, or other impacts.		C	Public Lands
3	231	Cave on the west side of Eagle Creek southwest of Clifton containing corn cobs and other trash. Condition unknown; bat guano present.		C	Private
5	259	Large jasper and rhyolite quarry east of Clifton near National Forest boundary. Many flakes and cores present. Condition good; no vandalism, erosion, or other impacts evident.			Arizona
	260	Cave northeast of Clifton containing minimum depth and minimum cultural remains. Condition good; interior has remained dry, no vandalism or other impacts evident.		C	Public Lands
6	159	Large food processing and possible habitation site east of Clifton. Over 20 metates and 1 bedrock mortar present and a few sherds. TG&E powerline and dirt road cut site. Burial removed in August 1973 by University of Arizona. Condition fair; road and powerline, 1 vandals' pothole, erosion minimal.		B	Private
	248	Lithic scatter east of Clifton containing abundant flakes and flake tools. 95% of material is obsidian, 5% chert. Historic house (historical site No. 55) is at NE end of site. Condition good; probable collecting by historic residents and slight trampling by cattle.		B	Private
	250	Large chert quarry and tool production area east of Clifton. Thousands of white chert flakes, hundreds of cores, and a few flake tools present. Condition good; no vandalism; erosion, deposition, and trampling slight.		B	Arizona
	251	Processing site east of Clifton containing a few basin and slab metates. No pottery or other remains. Condition good; probable collecting by nearby residents of historical site No. 59; erosion, deposition, and trampling by cattle slight.		C	Private
	252	Small processing site east of Clifton containing 4 small (little used) bedrock mortars in a wash bottom. No other remains. Condition fair; mortars have been worn down by intermittent flow of wash. Historical site No. 60 is nearby.		C	Private
7	14	Agricultural terraces overlooking Gila River south of Clifton. Size and present condition of site unknown.		B	Public Lands
	161	Mogollon village and pictographs on Eagle Creek south of Morenci. Village consists of a few cobble foundation rooms with pottery and lithic tools. Condition fair; some digging by vandals below pictographs.	Yes		Private and Patented (Federal Power Administration)
	197	Small processing site on the Gila River south of Morenci. Sparce scatter of flake tools, 1 trough metate and 1 one-hand mano fragment. Appears to be a food-processing activity area of site 198 located nearby. Condition good; no vandalism erosion minimal, deposition slight, trampling slight.		C	Public Lands
	198	Large village overlooking Gila River south of Morenci. Contains 9 visible cobble rooms in 4 loci. Ceramic and lithic trash abundant. Condition good; 2 rooms dug by vandals, moderate deposition, trampling minimal.	Yes		Public Lands
	199	Small sherd and lithic scatter overlooking the Gila River south of Morenci. Remains sparse. Condition good; no vandalism; erosion, deposition and trampling minimal.		C	Public Lands
	200	Small habitation site overlooking the Gila River south of Morenci. A single rubble mound with 2 visible cobble rooms and 1 lithic tool are present. Condition poor; extensive digging by vandals; erosion and trampling minimal.		C	Public Lands
	201	Small lithic scatter overlooking the Gila River south of Morenci. Sparce meta-sediment cores and unutilized flakes. Condition good; no vandalism; erosion minimal. Trampling appears heavy, abundant non-cultural flakes in area.		C	Public Lands
8	273	Small rhyolite chipping station near the Gila River south of Clifton. Single core and about 25 flakes present. Condition good; no vandalism erosion, or trampling.		C	Private
	274	Small village overlooking the Gila River south of Clifton. Contains a minimum of 2 rooms with cobble foundations and a sherd and lithic scatter. Condition good; barbed wire fence bisects site; no evidence of vandalism, erosion or trampling.	Yes		Private
9	157	Petroglyph panel southeast of Clifton containing about 24 figures. Site 257-a processing site is nearby. Condition good; portion of panel faint from weathering; no vandalism.	Yes	A	Private
	254	Small lithic scatter southeast of Clifton. Sparce cores and flakes. Condition good; no vandalism; erosion and trampling minimal.		C	Arizona
	255	Small cave southeast of Clifton containing deep ashy fill and sparce sherds, lithics, and animal bones. Condition fair; some digging by vandals, cattle stand in cave for shade, cave fill is dry.		C	Private
	256	Small lithic scatter southeast of Clifton containing 1 basin metate, 1 scraper, 1 core and a few flakes. Condition good; no evidence of vandalism, erosion or trampling.		C	Private
	257	Hohokam processing site southeast of Clifton near site 157-a petroglyph site. Present are 14 bedrock mortars and 3 bedrock metates in wash bottom. Processing camp on bank contains possible earth ovens, diverse lithic tool concentration and pottery. Condition good; mortars and metates worn slightly from wash flow; no evidence of vandalism or other erosion; deposition slight.	Yes	C	Private
12	247	Large processing site east of Three Way consisting of 5 activity loci. A minimum of 10 bedrock mortars, 1 boulder mortar, 5 metates, 1 mano, 2 roasing pits, sparce flake tools and sparce Mogollon pottery are present. Condition good; no evidence of vandalism, sligh erosion at all loci, slight deposition at 4 loci, trampling minimal.	Yes	B	Public Lands, Private, Arizona

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

APPENDIX G (cont.)

Allotment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Ownership Status
14	291	Large lithic scatter southeast of Three Way which appears to be a quarry area. Condition good; slight erosion from sheet wash and channel cutting. Proposed powerline right-of-way will cross site.		B	Public Lands, Arizona
16	70	Pictographs under a cliff overhang in the Peloncillo Mountains between Safford and Three Way. Several figures in red paint present. Site No. 202-a cave habitation site is a few meters away. Condition fair; some figures are faint due to weathering, vandals have written over some figures.	Yes	B	Public Lands
	202	A cave located in the Peloncillo Mountains between Safford and Three Way with a trash-covered level exterior area. Trash includes metates, Hohokam pottery, flake tools and a tabular knife-hoe. Interior of cave contains deep layer of cow manure which has been recently burned. Site No. 70-pictographs-is about 50 meters west. Condition good; cow manure cap has protected cultural remains from vandalasm, slight erosion and trampling outside of cave.	Yes	C	Public Lands
	234	Two bedrock mortars 10 meters from a shallow cliff overhang located in the Peloncillo Mountains between Safford and Three Way. No other remains and no evidence of utilization of overhang. Condition good; no vandalism; erosion minimal, deposition moderate, trampling minimal.		C	Public Lands
22	246	Small site in the Summit Mountains in New Mexico northeast of Duncan consisting of 2 slab metates with no other remains evident. Condition good; no vandalis; erosion and trampling minimal; slight deposition.		C	Public Lands
	249	Rock shelter under a small cliff overhang in the Big Lue Mountains northeast of Duncan. Low crude stone wall across front of overhang. No other remains. Condition good; possible digging by vandals in past, minimal erosion, slight deposition, no trampling.		B	Public Lands
25	164	Large Salado-Hohokam village on the Gila River east of Safford. Multi-story room blocks and much trash evident. Site has been recorded by many archaeologists. Condition poor; site chained in 1959 and has been dug extensively by vandals since 1974. Scheduled for access fence in summer 1978.	Yes	C	Public Lands
26	241	40 bedrock mortars in wash bottom in the Peloncillo Mountains between Safford and Three Way. No other remains. Condition good; slightly water worn from intermittent wash flow.		B	Public Lands
28	253	Small cliff overhang southeast of Three Way containing a deep ashy fill and Mogollon pottery. Condition good; interior remains dry and no disturbances present.		C	Public Lands
32	242	Small cave in Peloncillo Mountains between Safford and Duncan containing sparce sherds and lithics. Cave fill shallow. Condition good; interior dry, javelina occupy cave.		C	Public Lands
33	64	Lithic scatter and possible quarry near Gila River north of Duncan. No known adverse impacts.		B	Public Lands
36	235	A site northeast of Duncan consisting of a large petroglyph panel on a cliff face and one small panel on a boulder. Two time periods represented with horse figures in each. Site No. 236-a bedrock mortar is located 400 meters away. Condition good; a few recent drawings by vandals on large panel, small panel broken into 2 fragments, weathering slight.	Yes	A	Private

Allotment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Ownership Status
	236	20 bedrock mortars in wash bottom northeast of Duncan. No other remains. Site No. 235-petroglyphs-is nearby. Condition good; slight wearing down of mortars from wash flow.		B	Private
	339	Prehistoric site in New Mexico northeast of Duncan reported by New Mexico State University. No adverse impacts reported.		C	Private
	340	Prehistoric site in New Mexico east of Duncan reported by New Mexico State University. No adverse impacts reported.		*	Public Lands
37	1	Indian Rocks site west of Duncan. Consists of numerous bedrock mortars. Condition good; no evidence of disturbance.		B	Public Lands
43	15	Small sherd and lithic scatter in New Mexico southeast of Duncan. Condition unknown.		C	Public Lands
	16	Small Mimbres Mogollon sherd and lithic scatter in New Mexico southeast of Duncan. One hearth, manos, metates, and a few flake tools present. Condition unknown; possible slope wash and wind erosion on stabilized dune ridge.		C	Public Lands
	17	Sherd and lithic scatter with 3 visible hearths on stabilized dune ridge in New Mexico southeast of Duncan. Metates, manos, flake tools and sparce sherds present. Condition unknown; possible wind erosion.		C	Public Lands
	156	Large Mogollon food processing site in Peloncillo Mountains south of Duncan consisting of a minimum of 2 roasting pits, 6 metate fragments, 4 mano fragments, 2 tabular knife-hoes (mescal knives), abundant flakes, and abundant pottery. Condition fair; 1 roasting pit bisected by wash; other near wash, moderate sheet wash, no vandalism.	Yes	B	Arizona
	245	Petroglyphs on a small boulder in Peloncillo Mountains south of Duncan. 2 human figures and 1 serpent figure present. Site No. 156-Mogollon processing site-is 3/10 miles away. Condition good; boulder could be carried off and petroglyphs are visible from road.		B	Arizona
	341	Prehistoric site in New Mexico southeast of Duncan reported by New Mexico State University. No adverse impacts reported.		*	Public Lands
	342	Prehistoric site in New Mexico southeast of Duncan reported by New Mexico State University. No adverse impacts reported.		*	Public Lands
	343	Prehistoric site in New Mexico northwest of Lordsburg reported by New Mexico State University. No adverse impacts reported.		*	Public Lands
	344	Habitation site in New Mexico northwest of Lordsburg reported by New Mexico State University. Site probably contains pithouses. No adverse impacts reported.		*	Public Lands
44	243	Mogollon food processing site in Peloncillo Mountains south of Duncan. Site consists of 30 bedrock mortars, 3 bedrock metates, scattered evidence of roasting pits, diverse and abundant flake tools and a few sherds. Condition fair; disturbed by Civilian Conservation Corps camp on site; no digging by vandals, deposition up to 30 centimeters, erosion minimal, trampling by cattle slight.	Yes	B	Public Lands, Private
	244	Small food processing site in New Mexico near Peloncillo Mountains south of Duncan. 1 bedrock mortar and a few flake tools present. Condition good; no vandalism; erosion and deposition minimal.		C	Public Lands, New Mexico
	345	Prehistoric site in Peloncillo Mountains in New Mexico northeast of San Simon, Arizona,reported by New Mexico State University. No adverse impacts reported.		*	Public Lands

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair
*Recreation quality not rated

APPENDIX G (cont.)

Allot-ment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Owner-ship Status
45	4	Small rock shelter in Peloncillo Mountains northeast of San Simon, Arizona, containing a single room of rock walls with mud mortar. Condition good; no vandalism, erosion, deposition or trampling. Sites Nos. 5, 6, 237, 238, 239, and 240 are within ½ mile and in same canyon.		B	Public Lands
	5	Small rock structure under large boulder in Peloncillo Mountains northeast of San Simon, Arizona. Single room of unshaped stone slabs with no mortar. No other remains. Condition good; no vandalism, deposition or trampling; slight erosion.		B	Public Lands
	6	Small rock shelter in Peloncillo Mountains northeast of San Simon, Arizona. Stone with mud mortar room is under cliff overhang. No other known remains. Condition good; no adverse impacts reported.		B	Public Lands
	237	Large cliff overhang in Peloncillo Mountains northeast of San Simon, Arizona, containing wall fall of two stone walls. No mortar was used. 3 slab metates are only other remains present. Condition fair; no vandalism, slight use as cattle shade, site is damp from seep water; deposition up to 1 meter deep.		C	Public Lands
	238	Rock shelter under cliff overhang in Peloncillo Mountains northeast of San Simon, Arizona. Wall fall of 2 parallel rock walls without mortar are only remains other than a few small pieces of charcoal. Condition good; no vandalism, shelter front is damp from seep water deposition may be up to 1 meter deep.		C	Public Lands
	239	Site under a small cliff overhang in Peloncillo Mountains northeast of San Simon, Arizona. 1 slab metate and 1 obsidian flake tool are the only remains. Condition good; interior damp from seep water, deposition up to 1 meter.		C	Public Lands
	240	Small cave in Peloncillo Mountains northeast of San Simon, Arizona. No surface remains evident but fill of perhaps 2 meters deep believed to contain cultural remains. Condition good; no vandalism, slight use as cattle shade, interior damp near mouth from seep water.		C	Public Lands
46	320-332	All recorded sites (13) in allotments Nos. 46, 100 and 101 comprise part of Foote Wash - No-Name Wash Archaeological District, which is now on the National Register on Historic Places. The district overlooks the Gila River Valley southeast of Safford and is within a flood control project area. All sites have received mitigative clearance following field work. All sites will be affected by the flood control project, which is under-way at present.	On	B	
	320	Site No. 320 is an agricultural site consisting of small cobble check dams in the bottom of Foote Wash. A few sherds are present. Condition poor; test excavations, badly eroded from gully washing, will be in flood pool of dam presently being constructed.			Arizona
	322	5 Separate loci containing cobble hearths, cobble concentrations, basalt workshops, and core and flake scatters. Site appears to be Cochise. Condition good; all loci may receive indirect (secondary) impacts during dam project construction.			Public Lands
	323	A single locus containing cobble alignments and abundant scattered cores and flakes. Alignments may be agricultural gridded gardens. Condition good; indirect impact from construction expected.			Arizona
	324	A single locus similar to site No. 323 with same condition and expected impacts.			Arizona
	325	A single locus consisting of a cobble concentration, basalt mano, 1 plainware sherd and a scatter of cores and flakes. Condition good; indirect impact from construction expected.			Arizona
48	9	A series of cliff overhangs and small caves in Whitlock Mountains southwest of Duncan. Some contain lithics. Complete inventory not conducted. Condition fair; some digging by vandals, no other disturbances reported. Site extends into Allotment No. 55.		C	Public Lands
	62	A small lithic scatter in Whitlock Valley west of Duncan containing many utilized flakes. Condition poor; badly eroded and cut by several small gullies.		C	Arizona
	112	Large sherd and lithic scatter north-east of Bowie between the Whitlock and San Simon Valleys. Site contains much trash including sea shells and likely contains sub-surface structures. Site No. 282-habitation site with abundant mortars is near by. Condition fair; dirt road cuts through site, reports of digging by vandals in early 1900s.	Yes	C	Arizona
	113	Sherd and lithic scatter northeast of Bowie between the Whitlock and San Simon Valleys. Remains more sparce than at other sites in area and include scattered fire-cracked rock, rare manos, flakes and sherds. Condition poor; dirt road cuts through site; reports of frequent collecting for many years; deposition of sand appears great.		C	Arizona
	114	Large sherd and lithic scatter with scattered dwellings northeast of Bowie in lower Whitlock Valley. Site as inventoried is almost a mile long and should be divided into many sites during intensive survey. Condition fair; much deflating of dune ridges by wind; remains therefore mixed; slight to moderate digging by vandals, slight trampling by cattle.	Yes	C	Arizona
	120	Sherd and lithic scatter between the Whitlock and San Simon Valleys north-east of Bowie containing plainware pottery, flake tools and hammerstones. Decorated pottery and probably other remains reported in 1937 are absent at present. Condition poor; dirt road and wash cut through site; area well known and has been heavily collected.		C	Public Lands
	121	Large sherd and lithic scatter with mammoth teeth eroding out of site located in Whitlock Valley northeast of Bowie. Site appears to contain Paleo-Indian remains underlying a Mimbres Mogollon occupation. Condition poor; in sand dune area, erosion occurring on site, dirt road crosses site.		C	Arizona
	122	Large San Simon Mogollon village in San Simon Valley northeast of Bowie. No surface evidence of structures but many hearths present and pottery and lithics are abundant and diverse. Jewelry and exotic artifacts were once present. Condition fair; no evidence of digging by vandals but surface collecting has been extensive for many years. Wind is removing much over-burden in the dune and is transporting remains.		C	Private
	123	Sherd and lithic scatter in San Simon Valley northeast of Bowie containing manos, metates, flake tools and San Simon Mogollon pottery. An early historic concrete water pipe was exposed in the wash bank but no remains evident at present. Portions are present at site No. 128. Condition poor; site is badly eroded from gully washing.		C	Public Lands, Arizona
	124	Large Mimbres Mogollon sherd and lithic scatter in the Whitlock Valley southwest of Duncan. Remains include choppers and flake tools scattered along a sand dune ridge. Condition unknown but wind erosion has disturbed site.		C	Arizona

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

APPENDIX G (cont.)

Allotment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Ownership Status
	125	Small Mimbres Mogollon sherd and lithic scatter in the Whitlock Valley southeast of Duncan. Remains include grinding tools and chipped stone tools. Site appears to be an isolated locus of site No. 124. Condition unknown; wind erosion in sand dune has disturbed site.		C	Arizona
	127	2 rock shelters and associated sherd and lithic scatter in the Whitlock Valley southwest of Duncan. Larger cave contains about 2 bedrock mortars, 3 pictographs, 8 basin metate fragments, logs and an ashy fill. Small cave has many bedrock mortars in front. Condition poor; extensive digging by vandals, burning of logs by visitors.		B	Arizona
	128	Mogollon-Hohokam village between the Whitlock and the San Simon Valleys northeast of Bowie. Site contains sherd and lithic trash, abundant burned and unburned bone, calcined bone, and fire cracked rock. Presence of cremations is evident and one eroding burial has been found. Site depth a minimum of 25 centimeters. Condition poor; large and small washes cut through site as does a dirt road. Site is on sand dune which is being disturbed also by wind.	Yes	C	Arizona, Private
	132	San Simon Mogollon sherd scatter in San Simon Valley northeast of Bowie. 1 acre size site recorded in 1938 is now completely buried by sand through natural deposition. Condition of buried remains unknown.		C	Private
	134	A San Simon Mogollon camp or shrine in the pass between the Whitlock and San Simon Valleys northeast of Bowie. Site is at a spring which revealed abundant artifacts when dug out recently. Many manos, metates, and projectile points, shell bracelets, turquiose beads, crystals, axes and pottery were uncovered. Condition poor; spring dug out by mechanical equipment collectors gathered artifacts.		C	Private
	158	Rock shelter with pictographs in Peloncillo Mountains between Safford and Duncan. Bedrock mortars and lithic tools also present under cliff overhang. Condition fair; digging by vandals.	Yes	B	Arizona
	163	Cliff overhangs with pictographs on east side Whitlock Mountains southwest of Duncan. Sparce lithic scatter and bedrock mortars present. Condition poor; extensive digging by vandals.		B	Arizona
	168	Sherd and lithic scatter with bedrock mortars in Whitlock Mountains southeast of Safford. Condition good; no known adverse impacts.		B	Public Lands
	171	Cliff overhang with metates, sparce artifacts, and fire-blackened ceiling in Whitlock Mountains southeast of Safford. Condition fair; some digging by vandals.		C	Arizona
	182	Small rock shelters containing sparce sherds and flakes in Peloncillo Mountains east of Safford. Benches in area also contain sparce sherd and flake scatters. Condition good; no vandalism or other adverse impacts observed.		C	Public Lands
	282	Habitation-processing site in pass between Whitlock and San Simon Valleys northeast of Bowie. Site contains a few stone room outlines and over 27 bedrock mortars. Pass is one continuous sherd and lithic scatter (site No. 112) to the west and north of site No. 282. Condition good; no digging by vandals but occurs in area, no other visible impacts.	Yes	B	Arizona
	301	Sherd and lithic scatter on San Simon River southeast of Safford. Condition poor; nearly destroyed by gully washing and sheet wash along edge of San Simon River channel.		C	Public Lands
50	69	Two caves and a cliff overhang site in Peloncillo Mountains between Safford and Duncan. Both caves and the overhang contain pictographs-prehistoric red paintings and Apache black paintings. 1 bedrock mortar present and sparce lithics. Mud structure under overhang. Apaches used caves as hideouts, early Spanish remains reported. Condition poor; red paintings faint; digging in cave by vandals searching for gold, etc.	Yes	B	Public Lands
51	302	John's petroglyphs on two small boulders south of Safford. Mogollon pottery present. Condition good; considerable weathering of figures; attempts by vandals to remove some figures.		B	Private
52	265	Sherd and lithic scatter with burned soil south of Safford. Condition poor; sheet wash and gully erosion, road cuts through site.		C	Arizona
	287	Processing site south of Safford containing 21 bedrock mortars, sparce lithics and one occupied boulder overhang. Condition good; slight weathering of mortars by wash flow and slope runoff.		B	Arizona
53	11	Small sherd scatter near San Simon River north of Bowie. Pottery is Mimbres Mogollon. Condition good; improved gravel road may have disturbed site.		C	Public Lands
	63	Large sherd scatter on San Simon River southeast of Safford. Scatter was dense in 1973 but is now sparce. Condition poor; site cut by deep washes bordering river. Vandals are collecting on site. Site nearly destroyed.		C	Public Lands
	299	Habitation site on San Simon River north of Bowie. Architecture, burials, Mogollon and Hohokam painted pottery, and hearths present in 1968. All destroyed now. Only plainware sherds and a few flake tools remain; site is now just a sherd and lithic scatter. Condition poor; nearly destroyed by degrading of gully banks and sheet wash denuding surface.		C	Public Lands
	303	Sherd and lithic scatter on San Simon River midway between Safford and Bowie. Only a few stone tools and scattered Hohokam and Mogollon sherds remain. Condition poor; portion of site destroyed by channel cutting along bank of river, site denuded by sheet wash.		C	Public Lands
	304	Possible habitation site on the San Simon River midway between Safford and Bowie. Little remains but a sparce sherd and lithic scatter consisting of hammerstones, metates, flake tools and pottery, including Gila Polychrome. Condition poor; nearly destroyed by channel cutting along river bank and sheet wash denuding surface.		C	Public Lands
54	267	Small processing site at base of Pinaleno Mountains south of Safford. Site contains two small rock shelters, several roasting pits, a minimum of 14 bedrock mortars and 8 bedrock metates, and a scatter of sherds and lithics. Condition good; no vandalism; erosion and deposition minimal.	Yes	B	Public Lands
55	9	See description in Allotment No. 48.			
	10	Large sherd and lithic scatter on dune ridge in San Simon Valley northeast of Bowie. Sherds and lithics are dense and are exposed in blowouts in the sand dune. Condition good; wind erosion and mixing of remains; dirt road crosses site.		B	Public Lands
	117	Small sherd and lithic scatter in San Simon Valley north of Bowie. Remains are sparce. Condition good; no evidence of any adverse impacts.		C	Public Lands
	133	Single room containing pottery in San Simon Valley north of Bowie. Condition unknown.		C	Private

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

Allot-ment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Owner-ship Status
	173	Possible habitation site in San Simon Valley northeast of Bowie. Site consists of scattered pottery, manos, metate fragments, flake tools and possible roasing pits or hearths. Condition fair; dirt road crosses site.		C	Arizona
	275	Cochise culture lithic scatter in San Simon Valley northeast of Bowie containing concentrations of flakes, one-hand manos and fire cracked rock in dune blowouts. Condition fair; wind erosion has caused blowouts and mixed the cultural remains.		B	Public Lands
	276	Small sherd and lithic scatter in San Simon Valley northeast of Bowie. Diverse remains of chipped and ground stone tools present in a sand dune blowout with Hohokam and Mogollon sherds. Condition fair; dirt road cuts through site, remains are mixed from wind deflating dune.		C	Public Lands
	300	Small processing-possible habitation site in the Whitlock Mountains southwest of Duncan. Site contains 16 bedrock mortars and metates and a few stone circles and stone concentrations that may be the remains of structures. Condition good; road shored up with rock, crosses site ; small concrete dam on site.		C	Public Lands
57	115	Small pit house village with sherd scatter near Bowie. Cultural depth thin. Condition good; no known adverse impacts.		C	Arizona
	116	Small pit house village near Bowie with cultural depth of up to 5 feet. 12 low mounds are present. Condition good; no known adverse impacts.		C	Public Lands
	131	Sherd and lithic scatter in the San Simon Valley near Bowie. Chipped and ground stone tools present and pottery is San Simon Mogollon. Condition poor; sheet wash and gully washing; high voltage powerline crosses site.		C	Arizona
	180	Small sherd scatter near Bowie. Hohokam red on buff pottery present. Condition fair; southwest portion of site disturbed by presence of 2 dirt roads and an earthen water-detention dam.		C	Public Lands
	181	Sherd and lithic scatter near Bowie containing Hohokam and Mogollon painted pottery, metates, and projectile points. Condition fair; west edge of site disturbed by dirt road.		C	Private
58	135	San Simon Mogollon processing site near San Simon River northeast of Bowie. Site contains fire-cracked rock, ash concentra-tions, several manos, choppers, flakes, scraping tools and plainware pottery. Condition fair; deflation and sand blasting by wind.		C	Public Lands
59	7	Series of caves in Peloncillo Mountains northeast of San Simon, Arizona. Pottery and pictographs present. Site should probably be split into several sites during intensive survey of area. Condition good; no adverse impacts evident.	Yes	B	Arizona
	136	Sherd and lithic scatter near Peloncillo Mountains north of San Simon, Arizona. Pottery, manos, metates, and hammerstones found in sand dune blowouts. Condition unknown; wind erosion forming blowouts has mixed cultural remains.		C	Arizona
	139	Small Cochise culture site near Peloncillo Mountains northeast of San Simon, Arizona. 2 basin metates, 1 one-hand mano, and a sparce scatter of chert flakes are present. Condition good; slight wind erosion, no other disturbances.		C	Arizona
	140	Small village near Peloncillo Mountains northeast of San Simon, Arizona. Con-tains sparce pottery, crude stone tools, manos, trough metates, numerous fire-cracked rock, 1 roasting pit and 1 burial. Culture is San Simon Mogollon with possible Cochise and Apache components. Condition good; dirt road crosses site.	Yes	C	Private

Allot-ment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Owner-ship Status
	141	Large lithic scatter in Peloncillo Mountains north of San Simon. Possible stone pueblo. Rock shelters near by. Condition poor; no known disturbances other than dirt road and wash cutting through site.		B	Public Lands
	154	Petroglyphs and bedrock mortars in Peloncillo Mountains north of San Simon, Arizona. 5 petroglyph panels present. Condition fair; some petro-glyphs have been destroyed or covered by earthen dam construction, weathering slight.		B	Private
	160	Small mud and stone structure under cliff overhang in Peloncillo Mountains northeast of Sam Simon. No artifacts present. Single wall encloses front of shelter. Condition good; no adverse impacts reported.		B	Private
	296	Small Cochise site in San Simon Valley northeast of Bowie. Abundant hearth stones, grinding stones and chipped stone occur in a sand dune blowout. Condition unknown; wind erosion creating blowout has mixed remains. Dirt road crosses site.		B	Public Lands
60	2	Large habitation site under a cliff overhang in Peloncillo Mountains northeast of San Simon, Arizona. Site contains abundant perishables, including food items, pottery, stone tools, bone, and bedrock mortars. Red and black pictographs (some faint from weathering) are present. Site is very significant and is largest known site of its kind in the ES area. Condition fair; extensive digging by vandals and past trampling by cattle. Protective chain link fence has been constructed around site.	Yes	A	Public Lands
	142	Site under small cliff overhang in Peloncillo Mountains northeast of San Simon, Arizona. Site contains 3 low rock piles, human bone, plainware pottery, and sparce flakes. Ground stone recorded in 1970 not present today. No perishables. About 1 meter loose fill. Condition poor; much digging by vandals, heavy trampling by cattle.		C	Private
	143	Small cave in Peloncillo Mountains northeast of San Simon containing a single pictograph panel, plainware pottery, and flake tools. Some pictographs are of green paint. Condition poor; wash runs through cave, paintings weathered.		C	Public Lands
	144	Small pictograph panel in Peloncillo Mountains northeast of San Simon. 4 faint figures present under cliff overhang containing 3 possible cobble rooms. Condition poor; pictographs faint from weathering, trampling by cattle has disturbed room outlines.		C	Private
	145	Small site under cliff overhang in the Peloncillo Mountains northeast of San Simon. Contains chipped stone tools and gourd fragments. Condition good; floor covered by deep layer of cow manure, which has protected site from digging by vandals.		C	Public Lands
	146	Pictograph panel in Peloncillo Mountains in small rock shelter northeast of San Simon. Several painted figures in red, black, yellow, and white present. Sparce chert flakes in shelter. Condition fair; trampling by cattle, slight weathering of pictographs.	Yes	C	Private
64	129	Single pithouse near Dos Cabezas Mountains southwest of Bowie. Pottery, chipped stone tools and ground stone were recovered during salvage excavation of this San Simon Mogollon site. Condition poor; excavated, gas pipeline through site. Site basically destroyed.		C	Arizona

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

Allotment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Ownership Status
	130	Small Cochise site west of Bowie. Salvage excavation recovered fire-cracked rock, grinding equipment and lithic debitage. Condition; destroyed by complete excavation and borrow pit.		B	Arizona
68	85	Small village on the San Simon River north of San Simon, Arizona. Hearth stones and metates present. Site is mostly covered by deposition.		C	Private
69	12	Small processing site consisting of 4 bedrock mortars in wash bottom near Peloncillo Mountains northeast of San Simon. Historic stone structure nearby. Condition fair; mortars worn by wash flow.		B	Public Lands
73	3	Processing site at north base of Dos Cabezas Mountains south of Bowie. Numerous bedrock mortars present. Area contains many processing sites (92, 147, 148, 183, 184, 185, 196). Condition good; slight wind erosion.		B	Public Lands
	13	Petroglyph site at north base of Dos Cabezas Mountains southwest of Bowie. 4 panels present. Bedrock mortars located north of site. Condition poor; figures are faint due to weathering.		B	Arizona
	87	Large scatter of hearths near Dos Cabezas Mountains southwest of Bowie. No adverse impacts reported.		C	Public Lands, Arizona
	92	Small compound containing 3 or more stone and adobe rooms at base of Dos Cabezas Mountains south of Bowie. No adverse impacts reported.		C	Public Lands
	118	Small village containing 2 to 3 rooms near Dos Cabezas Mountains southwest of Bowie. Condition unknown.		C	Private
	119	Small village with pithouses and a possible quarry at base of Dos Cabezas Mountains southwest of Bowie. Condition unknown.		C	Arizona
	147	Small sherd and lithic scatter on north edge of Dos Cabezas Mountains south of Bowie. Manos, projectile points, and a trough metate are present. Condition unknown.		C	Private
	148	Small sherd scatter at base of Dos Cabezas Mountains south of Bowie. Condition unknown.		C	Public Lands
	183	Small rock shelter under large boulders at north base of Dos Cabezas Mountains south of Bowie. Deep fill contains a shell bracelet and abundant charcoal. Plainware sherds nearby. Condition good; no vandalism (extensive in area) or other disturbances.		B	Public Lands
	184	Small rock shelter under large boulder at north base of Dos Cabezas Mountains south of Bowie. Contains a minimum of 5 bedrock mortars and 1 mano. Fire blackened ceiling, no other remains. Condition good; no vandalism, slight erosion from small wash.		B	Public Lands
	185	Small rock shelter under small boulder at north base of Dos Cabezas Mountains south of Bowie. Contains abundant pottery, 4 pestles, 1 metate, 2 bedrock mortars, and a few flakes and cores. Condition poor; site nearly destroyed by vandals digging.		C	Public Lands
	196	Small rock shelter at north base of Dos Cabezas Mountains south of Bowie. 3 bedrock mortars and a variety of chipped stone tools and sherds are present. Roasting pits near shelter. Condition good; no vandalism, erosion and deposition minimal.		B	Public Lands
75	149	Large San Simon Mogollon habitation site near the Dos Cabezas Mountains south of Bowie. Contains many pithouses and two small surface structures. No known adverse impacts.	Yes	B	Public Lands, Private
	150	Quarry and sparce sherd scatter near east base of Dos Cabezas Mountains south of Bowie. No known adverse impacts.		B	Private
78	277	Large Mogollon sherd and lithic scatter in San Simon Valley south of San Simon. Site consists of 4 exposed loci in sand dune blowouts. Remains include a simple cobble hearth, cobble concentrations, a one-hand mano fragment, a few plainware sherds and sparce chert flakes. Condition fair; wind removing sand has dropped upper remains to level of lower remains.		C	Public Lands
	278	Small sherd and lithic scatter in San Simon Valley south of San Simon, Arizona. Site consists of a dense concentration of flakes, chipped stone tools and Mogollon and Hohokam pottery in a large dune blowout. Small basalt cobbles are numerous. Condition fair; remains are sand blasted and mixed from wind.		C	Private
82	91	A large Salado habitation site called Ninemile Ruin, located south of Bowie near the Dos Cabezas Mountains. Site consists of 4 units of contiguous puddled adobe rooms with diverse artifacts present. Site was partially excavated in 1940-1947. Condition poor; site has been extensively dug by vandals.	Yes	B	Private
90	98	Large Salado-like habitation site near the Chiricahua Mountains south of San Simon, Arizona. Contains a minimum of 4 stone rooms and a large firepit. Condition poor; site is being eroded by gully washing.		C	Private
	99	Large Salado-like habitation site near the Chiricahua Mountains south of San Simon, Arizona. Poorly defined scattered houses and a compound wall are present. No adverse impacts reported.		C	Private
	100	A small Salado-like habitation site near the Chiricahua Mountains south of San Simon, Arizona. A 5-room unit of unworked stone and sparce pottery are present. No adverse impacts reported.		C	Private
	101	Small processing site near the Chiricahua Mountains south of San Simon, Arizona, consisting of a single roasting pit ("mescal pit"). No adverse impacts reported.		C	Private
92	71	Large sherd scatter east of the Chiricahua Mountains south of San Simon, Arizona. No adverse impacts reported.		C	Private
94	58	Small Mogollon habitation site containing surface structures east of the Chiricahua Mountains near Portal. No adverse impacts reported.		C	Arizona
	72	Habitation site east of the Chiricahua Mountains by Portal, Arizona. A series of rooms and a single circular depression are present. Condition poor; site has been heavily collected.		C	Private
	73	Small sherd scatter east of the Chiricahua Mountains near Portal. No adverse impacts reported.		C	Private
	74	Small site east of the Chiricahus Mountains near Portal containing a single house and pottery. No adverse impacts reported.		C	Private
	75	Small sherd scatter east of Chiricahua Mountains near Portal. Condition poor; site has been heavily eroded by washes.		C	Arizona
	76	Habitation site consisting of stone and adobe surface ruins with Salado pottery east of the Chiricahus Mountains near Portal. No adverse impacts reported.		C	Private
	77	Covered Cochise midden east of the Chiricahua Mountains near Portal. Condition poor; excavated in 1935.		B	Private
	78	Small Mimbres Mogollon sherd scatter east of the Chiricahua Mountains near Portal. No adverse impacts reported.		C	Private
	79	Surface midden east of the Chiricahua Mountains near Portal. No adverse impacts reported.		C	Private

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

APPENDIX G (cont.)

Allot-ment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Owner-ship Status
	80	San Simon Mogollon pithouse village east of the Chiricahua Mountains near Portal. Condition poor; excavated in late 1930s.	Yes	A	Private
	81	Single burial of the earliest phase of the San Simon Mogollon located east of the Chiricahua Mountains near Portal. Condition poor; excavated in late 1930s.		B	Private
	83	Stone house east of the Chiricahua Mountains near Portal. No adverse impacts reported.		C	Private
	153	Mogollon sherd and lithic scatter containing manos, metates, and red ware pottery east of the Chiricahua Mountains near Portal. No adverse impacts reported.		B	Public Lands, Private
96	295	Pithouse village east of Chiricahua Mountains near Portal. Contains pithouses, manos, metates, hearth stones and plainware pottery. No adverse impacts reported.		C	Arizona
97	82	Mogollon habitation site east of the Chiricahua Mountains near Portal. No adverse impacts reported.		C	Public Lands
100		All known sites in the allotment are recorded in the National Register of Historic Places as the Foote Wash - No-Name Wash Archaeological Distroct. See discussion under Allotment No. 46.			
	329	Single locus consisting of a cobble concentration with scattered cores and flakes. Condition good; site will be destroyed by earthen dam structure.		**	Private
	330	Single locus containing a cobble concentration and a small scatter of basalt cores and flakes. Condition good; will be destroyed by dam structure.		**	Private
	331	Single locus with cobble concentration and a scatter of basalt cores and flakes. Condition good; site will be destroyed by a borrow pit.		**	Public Lands
101	321	Site contains 5 separate loci comprised of lithic workshops. 2 loci contain cobble piles. One of these also has a mano and chipped stone tools. Condition good: 2 loci will be destroyed by a borrow pit, 2 will be destroyed by a spillway, 1 is expected to be disturbed by indirect impacts of construction.		**	Arizona, Private
	326	Single locus comprised of a cobble pile and a scatter of cores, flakes and flake tools. Condition good; indirect construction impacts expected.		**	Public Lands
	327	Single locus consisting of 2 burned-rock circles. Condition good; indirect construction impacts expected.		**	Public Lands
	328	Single locus containing a cobble circle, a scatter of cores and flakes and a single incised rock. Condition good; site is near a borrow pit and direct or indirect construction impact is expected.		**	Public Lands
	332	Single locus consisting of a small cobble circle containing quartz pebbles. Condition fair; site will be destroyed by dam and spillway construction.		**	Public Lands
106	111	Mimbres Mogollon habitation site south of Safford consisting of a sherd scatter with evidence of stone walls of structures. Condition poor; highway cuts through site.		C	Private
118	44	See description under allotment No. 122.		C	
120	281	Large sherd and lithic scatter in the Mescal Mountains overlooking the Gila River west of San Carlos Reservoir. Abundant pottery, flakes and flake tools and a few metates are present. Condition fair; some digging by vandals, dirt road cuts through site, slight trampling by cattle.		C	Public Lands
121	293	Large sherd and lithic scatter in the Mescal Mountains overlooking the Gila River northeast of Winkelman. Abundant flakes and a few chipped stone tools present. Condition good; no adverse impacts present.		C	Public Lands
122	44	Large Salado habitation site between the Dripping Springs Mountains and Mescal Mountains north of Winkelman. Consisted of 50-60 stone and adobe rooms and associated trash. Site extends into allotment No. 118. Condition poor; destroyed by highway construction.		C	Arizona, Private
127	155	Cliff overhang containing numerous pictographs south of Winkelman. Sparce pottery present. Pictographs are in 5 colors and are Western Apache. A very rare and significant site. Interpretive study including reproduction of figures completed for BLM in 1975. Protective chain link fence installed in 1976. Condition poor; much vandalism by people painting and carving over figures, cliff face spalling off.	Yes	A	Public Lands
128	20	Large habitation site near Aravaipa Creek and the San Pedro River. Contains stone and adobe structures and Salado polychrome pottery. Cultural depth of 2-5 meters. Condition poor; site has been dug by vandals and a mining company, highway cuts through site.		B	Arizona
	23	Small cave near west end of Aravaipa Canyon. Contains Hohokam pottery and pendants, numerous projectile points, and a sandal fragment. Condition fair; digging by vandals.	Yes	C	Arizona
	175	Two cliff overhangs near west end of Aravaipa Canyon containing pottery, flakes, and charcoal pieces. Shallow cultural depth. Condition good; slight trampling by cattle, no vandalism.		C	Arizona
	176	Four cliff overhangs near west end of Aravaipa Canyon containing pottery, flakes and a fire-blackened ceiling. Condition poor; single long trench dig through site by vandal.		C	Arizona
	178	Small cliff overhang near central portion of Aravaipa Canyon. Site contained pictographs, petroglyphs, and a single burial. Condition poor; overhang converted to a ranch house with walls and a concrete floor.		B	Arizona
	206	A Cochise site near Aravaipa Creek and the San Pedro River. Site consists of several hearths, ash lenses, manos and other stone tools. Condition poor; a deep narrow wash cuts through the site.		C	Arizona
129	177	Two caves near central portion of Aravaipa Canyon containing charcoal, a worked soap weed stalk and a fire-blackened ceiling. Condition poor; 2 deep trenches dug through middle of site by a vandal.		B	Arizona
	189	Cave and cliff overhang near central portion of Aravaipa Canyon containing pottery, projectile points, a metate fragment, and a mano. Good cultural depth. Condition good; remains protected by deep layer of cow manure, slope wash on slope in front of cave.		C	Arizona
	190	Cliff overhang in the Aravaipa Canyon Primitive Area containing sparce pottery, numerous flakes, and projectile points. Cultural depth probably about 50 centimeters. Condition fair; site used intensely as cattle shelter, no vandalism.		C	Public Lands
	191	Cliff overhang in the Aravaipa Canyon Primitive Area containing pottery, flakes, sandal fragments, projectile points, a fire blackened ceiling, and a trash area in front. Condition fair; some digging by vandals, site used by cattle for shelter.		C	Public Lands (Primitive Area)
	195	Small cave in the Aravaipa Canyon Primitive Area containing plainware pottery and flakes. Condition fair; cattle and javelina have used cave for shelter.		C	Public Lands (Primitive Area)
130	268	Processing site in the Santa Teresa Mountains north of Aravaipa Creek. Site consists of 3 bedrock mortars in large boulders in the bottom of a gulch. Condition fair; stream flow has worn mortars.		C	Public Lands

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

**Site part of archaeologic district and not rated separately

Allot-ment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Owner-ship Status
134	264	Salado habitation site in Aravaipa Canyon east of Klondyke, Arizona. Site contains a minimum of 7 rooms and a possible cobble check dam. Pottery and lithic trash is present. Condition fair; dirt road passes through site, creek is cutting away one side of site, a few holes dug by vandals are present.	Yes	C	Private
136	8	Small cliff dwelling in side canyon of Aravaipa Creek northwest of Klondyke. A single stone and adobe room and sparce sherd scatter are present. Condition good; vandals have disturbed structure and dug inside. Site is being nominated to the National Register of Historic Places and will be stabilized in 1977.	Yes	A	Public Lands
	60	Small cave containing petroglyphs and painted petroglyphs south of the Aravaipa Canyon Primitive Area northwest of Klondyke. Site is unique in that some of the petroglyphs are deeply grooved and are also painted. Cave ceiling is fire blackened. Sherds and lithics present. Condition good; no disturbances present. Rock art in excellent condition.	Yes	A	Arizona
	188	Cliff overhang north of Klondyke containing petroglyphs, pictographs, and a few sherds and lithics. Pictographs record a massacre of Indian women and children. Condition good; no vandalism, slight weathering, no cattle under overhang.	Yes	B	Arizona
	193	Small cave in the Aravaipa Canyon Primitive Area containing a mano and metate and a few plainware sherds. Condition poor; cave has been used as a javelina den.		C	Public Lands (Primitive Area)
	194	Small sherd and lithic scatter north of Aravaipa Canyon Primitive Area. Site contains plainware pottery, flakes, and a minimum of 1 stone axe. Condition good; no vandalism, slight trampling by cattle in past (excluded now), slight sheet wash.		C	Arizona
	219	Habitation site in a large cave north of Aravaipa Canyon Primitive Area containing pottery, lithics, sandals and cotton cloth. Condition fair; some digging by vandals.	Yes	C	Arizona
	263	Small cave southeast of the Aravaipa Canyon Primitive Area containing a two-room adobe and wood structure believed to have been used for storage. Site is being nominated to the National Register of Historic Places. Condition fair; walls have deteriorated from weathering.	Yes	B	Public Lands
137	59	Small sherd scatter southeast of Aravaipa Canyon Primitive Area. Salado pottery is present. Condition good; no vandalism or other adverse impacts.		C	Arizona
	167	Habitation-processing site under a cliff overhang in the east end of Aravaipa Canyon contining 2 stone masonry rooms and 29 bedrock mortars. Condition good; walls partially collapsed; no direct evidence of presence of vandals or cattle.	Yes	B	Private
	192	Small cliff overhang in the Aravaipa Canyon Primitive Area containing pottery, clothing or matting fragments, and a few flakes. Ceiling is fire blackened. Condition poor; dug by vandals, used as camp by area visitors.		C	Public Lands (Primitive Area)
138	19	Small Hohokam-Salado habitation site overlooking Aravaipa Creek southeast of Winkelman. Site contains 4-5 cobble structures, mano and metate fragments, chipped stone tools, pottery and bone fragments. Condition good; no vandalism or other adverse impacts.	Yes	B	Public Lands
	205	Large pithouse village overlooking Aravaipa Creek southeast of Winkelman. Artifacts include chipped stone, mano fragments, pottery and heat fractured rocks. Condition good; no vandalism or other adverse impacts.	Yes	B	Public Lands
139	61	Large sherd and lithic scatter in the west end of Aravaipa Canyon. Possible prehistoric rooms present. Site is also the location of the Camp Grant Massacre, where a group of Anglos massacred 150 Aravaipa Apaches in 1871. (Historical site No. 87.) Condition poor; extensive digging by vandals.		A	Private
140	25	Small Hohokam-Salado habitation site on a terrace of the San Pedro River near the junction of the river and Aravaipa Creek. Several stone and adobe room outlines, chipped stone tools, and pottery are present. No adverse impacts reported.	Yes	C	Private
141	21	Small Hohokam-Salado habitation site in the San Pedro River valley northwest of Mammoth, Arizona. Site consists of 2 structures of multiple contiguous rooms with a diverse scatter of pottery and stone tools. Condition fair; moderate digging by vandals.	Yes	B	Arizona
147	27	Small rock shelter on the San Pedro River southeast of Mammoth. Site consists of scattered artifacts including lithics, plainware pottery, corn cobs, charcoal and a cane foreshaft fragment. No adverse impacts reported.		C	Private
	37	Cochise and Salado site on the San Pedro River southeast of Mammoth. Cochise hearths located up to 10 feet below surface. Sparce Saladoan remains on surface. Condition poor; site is being eroded away by gully washing.		C	Arizona
	42	Three agricultural fields near San Pedro River southeast of Mammoth. Clearing with rock piles, terraces, and dams present with sparce artifacts. No adverse impacts reported.	Yes	Q	Public Lands, Arizona
149	29	Single structure with cleared area on the San Pedro River southeast of Mammoth. Cleared area contains cobble alignments and a sparce sherd and lithic scatter. May be an agricultural field. Site was test excavated in 1970 and 1971. Condition poor; highway constructed through site, cleared area partially undisturbed.		C	Arizona
	30	Large Hohokam habitation site with agricultural fields on San Pedro River southeast of Mammoth. Site contains pithouses, trash mounds, extensive areas of rock alignments and rock concentrations, sherd concentrations, and cremations. Salvage excavation conducted in 1970-1971. Condition fair; highway constructed through sparce area of site.	Yes	B	Arizona
	31	Large Hohokam-Mogollon habitation site with agricultural fields on San Pedro River southeast of Mammoth. Salvage excavation in 1970-1971 of 21 pithouses, ramada-covered work areas, 36 cremations and 3 inhumations. Trash mounds and a mile of agricultural features are present. Condition poor; salvage excavation, highway constructed through site.	Yes	B	Arizona, Private
	33	Small habitation site with agricultural fields on San Pedro River southeast of Mammoth. Hearths and scattered sherds present with cleared fields containing rock piles and rock features. Condition fair; slight digging by vandals.		C	Arizona
	207	Small habitation site on the San Pedro River southeast of Mammoth. Salvage excavation in 1970-1971 located 6 pithouses, 8 hearths and other features. Site is Hohokam-Salado. Condition poor; excavated, highway crosses site.		C	Arizona, Private
151	50	Small habitation site in the Gila Mountains northwest of Fort Thomas. Site consists of a cave containing 2 mud, stone, and timber walls separating the cave into 3 rooms. Sherds are scattered down slope. Condition good; no disturbances.	Yes	B	Public Lands

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

APPENDIX G (cont.)

Allotment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Ownership Status
	56	Large cave in the Gila Mountains north of Fort Thomas containing a deep fill with abundant ground stone, chipped stone tools, pottery and abundant perishable items. Site was fenced in 1976 to exclude vandals. Condition poor; extensive digging by vandals, partial excavation, used by cattle as shelter. All impacts have been stopped.	Yes	B	Public Lands
	166	Small habitation site in the Gila Mountains north of Fort Thomas. A minimum of 6 non-contiguous cobble rooms, metates, and a sherd and lithic scatter are present. Condition good; slight digging by vandals.	Yes	B	Public Lands
	179	Large cave in Gila Mountains north of Fort Thomas containing a deep fill with abundant perishables, pottery, lithics, and charcoal. Condition fair; 1 long trench and several small holes dug by vandals; site inaccessible to cattle.	Yes	B	Public Lands
	186	Large habitation site in Gila Mountains north of Fort Thomas. Site contains a minimum of 24 non-contiguous rooms with cobble foundations. 2 D-shaped cobble structures and a dense sherd and lithic scatter are present. Condition good; slight digging by vandals; minimal erosion and trampling by cattle.	Yes	B	Public Lands
	187	Large habitation site in the Gila Mountains north of Fort Thomas consisting of a minimum of 15 cobble rooms and a general sherd and lithic scatter. Most rooms are non-contiguous. Condition good; 1 room completely excavated by an archaeologist, slight digging by vandals, slight trampling by cattle.	Yes	C	Public Lands
	261	Habitation site under a small cliff overhang in the Gila Mountains northwest of Fort Thomas, containing a single metate and sparce flake tools. Condition good; cattle use overhang for shelter; no vandalism; interior remains dry.		C	Public Lands
	298	Small habitation site in Gila Mountains northwest of Fort Thomas containing a minimum of 5 non-contiguous cobble rooms, a circular cobble structure, and a sherd and lithic scatter. Condition good; dirt road has disturbed one side of site, recent camping on site.	Yes	B	Public Lands
152	227	Large sherd scatter on the Gila River west of Fort Thomas. Condition good; dirt road passes near site.		C	Public Lands
	283	Petroglyph site north of the Gila River northwest of Fort Thomas. Site contains 2 petroglyph panels on boulders. Several large rock piles on site and in area served unknown function. Condition good; slight erosion (weathering), no vandalism.		B	Public Lands
154	203	A single petroglyph in the Gila Mountains northeast of Fort Thomas. Condition fair; petroglyph faded by weathering, no vandalism or other disturbances.		B	Public Lands
	229	Sherd and lithic scatter on the Gila River east of Fort Thomas. Manos and quartz crystals present. Test excavation conducted in 1960 by an archaeologist produced only sparce sub-surface remains. Condition fair; test excavations.		C	Public Lands
158	55	Habitation site in a large cave in the Gila Mountains north of Pima. Deep fill containing ash, sandals, corn cobs, and other trash. Condition fair; some digging by vandals.	Yes	B	Arizona
	221	Very large area of gridded gardens northeast of Pima. Thousands of agricultural plots on gently sloping terrain formed and cleared of rock by piling rock in waffle pattern alignments. No artifacts. No irrigation used. Site was nominated to National Register of Historic Places in 1975. Condition good; current flood control project features moved to avoid site.	Nominated	A	Public Lands
	223	Small area of agricultural terrace alignments north of Pima. No artifacts Condition fair; slope wash has eroded openings in some alignments.		C	Public Lands
	285	Three petroglyph panels on boulders northeast of Pima. No other remains. Condition fair; 1 of the boulders has been stolen by vandals, erosion of petroglyphs ranges from slight to heavy.		B	Public Lands
	286	Pictographs in a small cave in the Gila Mountains north of Safford. A minimum of 6 figures painted in black. Cave ceiling fire blackened. No other remains. Condition poor; pictographs badly weathered and faint, cattle use cave for shelter, trampling shallow cave fill.		B	Public Lands
165	53	Small habitation site in the Gila Mountains northeast of Safford consisting of a small cave enclosed by 2 stone masonry walls with heavy mud mortar. No other remains. Condition fair; shallow fill has been completely dug by vandals, walls are being eroded by weathering and insects(?). Walls will be stabilized in 1977. Site is being nominated to the National Register of Historic Places.	Yes	B	Public Lands
	315	Small habitation site in the Gila Mountains northeast of Safford containing a large stone-rimmed oval depression, a minimum of 5 cobble rooms, a cobble pile, and associated sherd and lithic scatter. Condition good; slight trampling by cattle.	Yes	C	Public Lands
	316	Small cliff dwelling in the Gila Mountains northeast of Safford. Site contains 4 rock and mortar rooms, a small cave and a path with rock and mortar edge. Perishables and sherds also present. Condition fair; rock fall has damaged 1 room, slight digging by vandals.	Yes	B	Private
166	52	Large cave containing metates in Gila Mountains northeast of Safford. Condition good; no vandalism or other disturbances.		B	Public Lands
	54	Small habitation site near the Gila River northeast of Safford containing rock wall alignments, abundant flakes chipped stone tools, pottery, and a few metate fragments. Condition poor; dirt road cuts through site extensive digging by vandals.		C	Public Lands
	107	Single petroglyph panel in Gila Mountains northeast of Safford. No other remains. Condition poor; recent painting over figures by vandals.		B	Private
	126	Small habitation site in the Gila Mountains northeast of Safford containing a sparce sherd and lithic scatter and possible cobble rooms and a pithouse. Condition good; occasional flooding likely on lower portion of site.		C	Private
	162	Large pictograph panel in Gila Mountains northeast of Safford. Many red figures present. Condition fair; some figures badly weathered, some figures shot at by vandals.		B	Private
	225	Large habitation site and gridded gardens overlooking Gila River east of Safford. Numerous stone room alignments and abundant sherds and lithics present. Agricultural fields are adjacent to village. Condition poor; extensive digging by vandals in village.	Yes	C	Private

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

Allotment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Ownership Status
	233	Large habitation site consisting of cliff dwellings under a long overhang in the Gila Mountains northeast of Safford. 34 visable rooms of stone masonry up to 3 stories in height. Many rooms buried by deposition and cliff collapsing. Red and white pictographs, room beams and abundant trash present. Condition fair; digging by vandals ranges from slight to great throughout site, portions of site probably destroyed by cliff collapsing.	Yes	B	Arizona
	284	Twelve petroglyph panels on boulders near Gila River northeast of Safford. Figures are messages about an adjacent trail leaving the valley. Condition fair; slight erosion of panels, some boulders reported to have been rolled down hill.	Yes	B	Public Lands
	297	Lithic scatter in the Peloncillo Mountains east of Safford containing flakes, cores, flake tools, and a single metate fragment. Condition good; dirt road crosses one edge of site.		C	Public Lands
	306	Single petroglyph panel on a boulder overlooking the Gila River northeast of Safford. Pecking stones and a small lithic scatter surround boulder. Condition good; possible weathering away of some petroglyphs.		B	Public Lands
	317	A ceremonial cave in the Gila Mountains northeast of Safford containing Anasazi ceremonial objects and a storage structure. Univ. of Arizona researchers have studied site and published findings. Condition poor; collapsed cave roof, slight digging by vandals.	Yes	B	Public Lands
	318	Small cliff dwelling in the Gila Mountains northeast of Safford consisting of foundations of possibly 3 rooms plus a small storage structure. Many perishable remains present in past. Condition poor; walls collapsed, storage structure broken into and remains removed.		C	Public Lands
	319	Small cliff dwelling site in the Gila Mountains northeast of Safford consisting of a mud walled single room dwelling and 2 mud storage structures in the cave. Perishables, lithics and pottery present. Condition fair; architecture in good condition, vandals have removed all interior items.	Yes	B	Private
168	292	Habitation site in a shallow cave in the Gila Mountains southwest of Clifton containing a deep fill with sherds, lithics and a single bedrock mortar. Condition poor; extensive digging by vandals, cave interior dry.		C	Private
178	51	Small habitation site in a cave near the Santa Teresa Mountains southwest of Fort Thomas. Cave contains 3 mud with stone walls dividing the shelter into 4 rooms; abundant sherds, lithics, and perishables in a deep dry fill. Site is being nominated to the National Register of Historic Places. Condition poor; extensive digging by vandals. Site will be enclosed with a chain link fence in 1977.	Yes	B	Public Lands
180	266	Habitation site north of the Santa Teresa Mountains southwest of Fort Thomas consisting of a long cliff overhang with an adobe structure and 3 boulder overhangs with sparce sherds and lithics. A dense sherd and lithic scatter covers the site area. The adobe structure is partially collapsed with 2 walls remaining. The site is being nominated to the National Register of Historic Places. Condition fair; adobe walls deteriorating slowly, slight digging by vandals, cattle use main overhang for shelter. Wall stabilization and a chain link enclosure are scheduled for the main overhang in 1977.	Yes	B	Public Lands
	269	Small sherd scatter north of the Santa Teresa Mountains southwest of Fort Thomas. Sherds are sparce. No other remains. Condition good; moderate sheet wash has transported and worn sherds.		C	Public Lands
	270	Small Salado habitation site north of the Santa Teresa Mountains southwest of Fort Thomas. Cobble alignments of several rooms are present with a sherd scatter. Condition good; minimal deposition; no vandalism or other disturbances.		C	Public Lands
	271	Small Salado habitation site north of the Santa Teresa Mountains southwest of Fort Thomas. Cobble alignments of a minimum of 6 rooms in 2 loci are present with portion of a possible outside wall and a sherd scatter. Condition fair; limited deep digging by vandals many years ago; dirt road cuts through edge of site; slight deposition.	Yes	C	Private
	272	Small cliff overhang north of the Santa Teresa Mountains southwest of Fort Thomas containing adobe wall fall, manos, metates, bedrock metates, pottery and a few lithics. Condition good; no vandalism; cattle use overhang for shade; site remains dry.		C	Private
	305	Small Salado habitation site north of the Santa Teresa Mountains southwest of Fort Thomas. Room foundation alignments of cobble stones and pottery are present. Condition poor; a large hole dug by vandals has disturbed much of site.		C	Public Lands
182	289	Small habitation site on the north slope of the Santa Teresa Mountains southwest of Fort Thomas. 2 cobble features and a single plainware sherd are present. Condition good; slight deposition.		C	Arizona
	290	Small habitation site on the north slope of the Santa Teresa Mountains southwest of Fort Thomas containing cobble alignments of a 1 or 2-room structure. Condition good; slight deposition.		C	Arizona
183	280	Large habitation or processing site near the east edge of the Santa Teresa Mountains southwest of Fort Thomas. Site consists of a sherd and lithic scatter with a locus of bedrock mortars. Condition good; jeep road crosses site; moderate sheet wash and channeling near road; slight to moderate deposition.		B	Arizona
186	174	Sherd and lithic scatter southwest of Pima. Condition poor; extensive digging by vandals, heavy use by cattle grazing; historic settlement and farming of area.		C	Public Lands, Private
190	214	Habitation site south of Pima consisting of 6-12 rooms of upright stone slabs and adobe and a large sherd and lithic scatter. No adverse impacts reported.	Yes	C	Public Lands
	215	Large habitation site south of Pima containing scattered room alignments, possible pit houses and a general sherd and lithic scatter. Condition poor; roads, ditches, a pond and recent trash are on the site.		C	Private
	216	Habitation site south of Pima consisting of a 10-12-room rock structure, bedrock metates and a general sherd and lithic scatter over a large area. Condition poor; canals, ponds and roads on site.		C	Public Lands, Private
	217	Large Salado habitation site south of Pima containing the disturbed remains of several stone dwellings and a scatter of bone, pottery and lithics. Condition poor; site basically destroyed by vandals digging, roads, and the owner digging up the site with a blade scraper.		C	Private
	218	Large habitation site south of Pima containing several room clusters and a large scatter of very dense and diverse sherds with metates; jewelry and other remains present. Condition fair; some digging by vandals.	Yes	C	Public Lands

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

Allot-ment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Owner-ship Status
	220	Small circular masonry pueblo southwest of Pima containing about 25 rooms and a kiva. Condition good; no adverse impacts present.	Yes	B	Arizona
	222	Prehistoric irrigation ditch with sherd concentrations southwest of Pima. Condition good; no disturbances reported.		B	Public Lands
	226	Large habitation site southwest of Pima consisting of 50-100 cobble rooms aranged around a plaza. Condition poor; extensive digging by vandals.		C	Public Lands
	307	Large Hohokam-Mogollon habitation site southwest of Pima consisting of many cobble-foundation rooms around a court-yard. Abundant sherds and lithics. Condition fair; extensive digging by vandals but much of site undisturbed dirt road and powerline cross site; several rooms being eroded away by a wash.	Yes	C	Public Lands
	308	Small Hohokam-Salado habitation site southwest of Pima with rock foundation alignments evident and a large dense sherd and lithic scatter. Condition poor; very extensive digging by vandals; historic irrigation system went through site.		C	Public Lands
	309	Small sherd and lithic scatter southwest of Pima containing ground and chipped stone tools and painted pottery. Condition poor; erosion along wash bank, dirt road through site.		C	Private
	310	Small habitation site southwest of Pima consisting of 3 clusters of cobble foundation rooms and a small sherd and lithic scatter. Condition poor; extensive digging by vandals.		C	Private
	311	Small habitation site southwest of Pima with disturbed room foundations of stone and a small sherd and lithic scatter. Condition poor; site basically destroyed by mechanical trenching and scraping, dirt road crosses site.		C	Private
	312	Large habitation and agricultural site southwest of Pima containing 12-15 circular pithouses, 2 large circular depressions, 2 major clusters of rectangular rooms with 6-8 rooms each, 2 roasting pits, and a sparce sherd scatter. 13 rock-terrace align-ments are present. Condition good; children have rearranged some rocks.	Yes	B	Arizona
	313	Small processing site southwest of Pima containing 8 bedrock mortars, 3 bedrock metates, and a nearby sherd scatter. Condition good; slight deposition.		B	Private
	314	Large sherd and lithic scatter southwest of Pima containing 2 boulder mortars, and a dense sherd and lithic scatter of primarily Mogollon pottery and chipped stone tools. Condition fair; erosion from gully washing, dirt road crosses site.		C	Private
The following sites are outside of allotments.					
	18	Small habitation-agricultural site near the junction of Aravaipa Creek and the San Pedro River. Historic Camp Grant built adjacent to site. Condition poor; disturbance by military post; extensive digging by vandals.		B	Private
	22	Large Hohokam-Salado habitation mound containing stone and adobe room outlines and abundant sherd and lithic trash. Located on the San Pedro River near Aravaipa Creek. Condition fair; limited digging by vandals, the old highway crosses edge of site.	Yes	B	Private

Allot-ment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Owner-ship Status
	24	Large Hohokam habitation site on the San Pedro River near Aravaipa Creek containing about 20 trash mounds, 200-400 pithouses, 2 ballcourts, and abundant trash. Site has been partially excavated by a college archaeological field school. Condition fair; site was cleared of brush by owner, slight digging by vandals, large ditch dug through site by owner, partially excavated.	Yes	A	Private
	26	Small lithic scatter near the San Pedro River northwest of Mammoth containing Cochise Culture projectile points and stone tools. No adverse impacts reported.		C	Arizona
	28	Small sherd scatter on the San Pedro River southeast of Mammoth. No adverse impacts reported.		B	Arizona
	32	Single cobble structure on the San Pedro River southeast of Mammoth. Condition poor; destroyed by highway construction.		C	Arizona
	34	Small Hohokam habitation site on the San Pedro River southeast of Mammoth. No adverse impacts reported.		C	Arizona
	35	Small Hohokam-Salado habitation site southwest of Mammoth consisting of 10 masonry and adobe rooms and associated trash. Condition fair; three rooms dug by vandals.		C	Arizona
	36	Large Hohokam-Salado habitation site southwest of Mammoth containing a minimum of 16 rooms, sherds and stone tools. No adverse impacts reported.	Yes	B	Arizona
	39	Large Hohokam-Salado habitation site on the San Pedro River near Mammoth. Site contains over 75 stone and adobe rooms and associated ceramic and lithic trash. Condition poor; extensive digging by vandals.		C	Private
	40	Habitation site with pottery southwest of Mammoth. No adverse impacts reported.		C	National Forest, Arizona
	41	Hohokam-Salado habitation site on the San Pedro River southeast of Mammoth consisting of cobble rooms, compound wall, ceramics and possible pithouses. Condition poor; slight digging by vandals, highway constructed near site.		B	Arizona
	43	Large Hohokam-Salado habitation site on the San Pedro River southeast of Mammoth. Numerous cobble and adobe rooms, manos and metates, ceramics and shell ornaments present. No disturbances reported.		C	Private
	45	Agricultural site on the Gila River west of Winkelman consisting of cleared fields with rock piles and a single stone and adobe field house. Condition poor; site has been partially dozed.		C	Private
	46	Hohokam-Salado habitation site on the San Pedro River south of Winkelman containing a compound, house mounds, a trash mound and associated trash. Condition poor; railroad cuts through site; digging by vandals.		B	Arizona
	47	Small sherd scatter on the Gila River west of Winkelman. Condition poor; area plowed by recent farming.		C	Private
	48	Small habitation site on the Gila River west of Winkelman containing boulder foundations of 6 or more rooms and part of a burial. Condition poor; gully washing.		C	Private
	49	Large Hohokam habitation site on the San Pedro River south of Winkelman containing a minimum of 4 trash mounds and an estimated 40-80 pithouses. Pottery and ornaments present. No disturbances reported.		C	Private
	57	Small lithic scatter southeast of San Simon, Arizona containing manos, cores, and flakes. No distrubances reported.		C	Private

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

Allotment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Ownership Status
	65	Large Hohokam-Salado habitation site near the Gila River southeast of Three Way consisting of about 45 stone and mud masonry rooms and compound. Ground and chipped stone tools and pottery present. Condition poor; extensive digging by vandals; large wash and highway cut through site.		C	Arizona
	84	Lithic scatter north of Portal consisting of manos possibly of the Cochise Culture. No disturbances reported.		C	Arizona
	86	Small village on San Simon River north of San Simon, Arizona. Mano and metate fragments eroding out. Condition poor; river is destroying site through gully wash.		C	Public Lands
	88	San Simon Mogollon habitation site south of Bowie consisting of low trash mounds and a minimum of 6 rooms. No disturbances reported.		C	Unknown
	89	San Simon Mogollon habitation site south of Bowie containing pithouses and trash mounds. No disturbances reported.		C	Unknown
	90	San Simon Mogollon habitation site at Bowie consisting of pithouses and associated trash. No disturbances reported.		C	Private
	93	Large sherd and lithic scatter on San Simon River north of San Simon, Arizona. Pottery, manos, obsidian and shell are present. Remains mixed in crusted over sand dune blowouts.		C	Public Lands
	94	Lithic scatter probably of Cochise Culture on San Simon River southeast of San Simon, Arizona. Condition poor; buried site is being heavily eroded by river.		C	Arizona
	95	Small Cochise site on the San Simon River southeast of San Simon, Arizona. Manos, metates, flakes and a hearth are exposed in river bank. Condition poor; site is buried and is being eroded away by river.		C	Private
	96	Small Cochise site on the San Simon River southeast of San Simon, Arizona. Metates and manos are exposed in the river bank. Condition poor; buried site is being eroded away by the river.		C	Private
	97	Large sherd and lithic scatter near the San Simon River southeast of San Simon, Arizona, consisting of San Simon Mogollon pottery and flakes. No disturbances reported.		C	Private
	102	Large sherd and lithic scatter south of Safford containing a wide variety of pottery types with ground and chipped stone. Condition poor; highway crosses site.		C	Private
	103, 104	Large San Simon Mogollon sherd and lithic scatters south of Safford. Condition poor; highway crosses sites.		C	Private
	105	Small Salado sherd and lithic scatter south of Safford containing metate fragments, obsidian and pottery. No disturbances reported.		C	Private
	106	Large sherd and lithic scatter south of Safford containing metate fragments, flakes, shell, and San Simon Mogollon pottery. May be a village. Condition poor; site has been plowed and farmed.		C	Private
	108	Sherd and lithic scatter south of Safford with ground stone tools and Salado pottery. Condition poor; presence of historic ranch has disturbed site through using lithics in a stone wall.		C	Private
	109	Possible pithouse village containing pottery south of Safford. No adverse impacts reported.		C	Private
	110	San Simon Mogollon stone and adobe ruin south of Safford. No adverse impacts reported.		C	Private
	137	Cochise processing site on the San Simon River near San Simon, Arizona containing projectile points, choppers, metates, manos, and pestles. Condition poor; river eroding site, highway and railroad border site.		C	Arizona

Allotment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Ownership Status
	138	Large Cochise lithic scatter on bank of San Simon River north of San Simon, Arizona. Projectile points and manos are present. Condition poor; river eroding site.		C	Private
	151	Large Cochise processing site on bank of San Simon River southeast of San Simon, Arizona. Hearth stones, charcoal and metates are exposed along the bank. Condition poor; river eroding site.		B	Private
	152	Large Cochise processing site on the San Simon River southeast of San Simon, Arizona. Hearthstones, charcoal, pestles, and manos are being eroded from the river bank. Condition poor; river eroding site.		B	Private
	204	Twelve small petroglyph panels on boulders northeast of Pima. Site No. 221-gridded gardens-border site. Condition good; abandoned road may have moved some boulders; boulders could be carried off.		B	Private
	208	Small Hohokam sherd scatter on the San Pedro River southeast of Mammoth. Possible pithouses or agricultural features present. Condition poor; digging by vandals, highway crosses edge of site.		C	Arizona
	209	Small habitation site on the Gila River northwest of Winkelman consisting of a rectangular structure of 8 rooms. Condition poor; extensive digging by vandals.		C	Private
	210	Large Hohokam-Salado habitation site on the Gila River west of Winkelman containing about 50 rooms, a trash mound, a possible canal and associated trash. Condition poor; extensive digging by vandals.		B	Private
	211	Small habitation site on the Gila River west of Winkelman containing a cluster of 6-8 rooms plus scattered rooms. Condition good; no disturbances reported.		C	Private
	212	Large Hohokam-Salado habitation site south of Winkelman consisting of compounds, house mounds and abundant trash of pottery, stone and shell. Condition poor; extensive digging by vandals, heavily dozed.		B	Private
	213	Habitation site on the San Pedro River near junction of Aravaipa Creek. Condition poor; site excavated in 1932.		C	Private
	224	Large habitation site near the Gila River northwest of Pima. Architecture was once present. Only a disturbed sherd and lithic scatter remain. Condition poor; site nearly destroyed by being in a plowed field, highway crosses site.		C	Private
	228	Sherd concentration on the Gila River northwest of Fort Thomas. Fire cracked rock also present. Condition poor; site has been plowed.		C	Private
	230	Small sherd and lithic scatter on the Gila River north of Fort Thomas. Condition poor; digging by vandals.		C	Private
	232	Cave in the Gila Mountains west of Clifton. No disturbances reported.		C	Unknown
	262	Salado habitation site near Aravaipa Creek northwest of Klondyke containing 6-10 non-contiguous rooms, 1 large circular depression, pottery and lithics. Condition good; slight digging by vandals, slight deposition.	Yes	B	Arizona
	279	Small sherd and lithic scatter near San Simon River southeast of San Simon, Arizona. Pottery is sparce, lithics are mostly flakes. Condition good; slight wind erosion and deposition, seldom used jeep road crosses site.		B	Private
	333	Marijilda Ruin-a large pueblo on the east slope of the Pinaleno Mountains south of Safford. Pueblo is on National Forest land and contains over 50 stone masonry rooms, 3 plazas and abundant trash. General sherd and lithic scatter extends east onto state land. Condition poor; extensive digging by vandals, road and canal through sherd and lithic scatter.	Yes	B	National Forest, Arizona

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

APPENDIX H

DESCRIPTION OF KNOWN HISTORICAL RESOURCES

Allotment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Ownership Status
1	14	Mining town northwest of Clifton. Established in 1872, it became a copper boom town with the state's first railroad. Condition poor; town destroyed by an open pit copper mine.	Yes	B	Private
	36	Safford-Morenci Trail crossing the Gila Mountains from Morenci (northwest of Clifton) to Safford. Very significant transportation and commerce route from 1873-1925. Mining towns of Morenci, Metcalf, and Clifton received supplies by pack mule over trail. Trail maintained by BLM at present as a recreation trail for hiking and horseback riding. Nomination forms for National Register of Historic Places completed. Site also crosses Allotments Nos. 3, 163, 165, 166, and 168. Condition good; portions in poor condition are being repaired.	Yes	A	Public Lands, Arizona, Private
	66	Miner's house with stone and concrete water tank in mountains northwest of Clifton. House is stone masonry with 2 rooms and has collapsed. Condition fair; bottle collecting, roof and upper walls collapsed.		C	Private
	67	Abandoned copper mine and mill in mountains northwest of Clifton. Mill skeleton of large wood beams remains standing. Other features and debris present. Condition good; structures weathered, no evidence of vandalism, access controlled.	Yes	B	Private
	68	Abandoned mining town in mountains northwest of Clifton containing the rubble mounds of a minimum of 6 houses and a large trash dump. Condition fair; structures collapsed and primary remains are trash, slight collecting, access controlled.	Yes	B	Private
3	90	Two stone houses in the Gila Mountains southwest of Clifton. Walls generally original height, roofs collapsed and gone, sparce trash. Graves nearby. Condition good; collecting, slight weathering		C	Private
5	23	Stone house in mountains north of Clifton probably used by miners. Walls partially standing, roof collapsed and gone. Condition poor; structure mostly collapsed from weathering, few remains.		C	Public Lands
	24	Small limestone kiln in mountains north of Clifton consisting of a circular stone feature used to make lime for local copper smelters. Condition good; walls standing, weathering minimal.	Yes	B	Arizona
	58	Stone house and associated stone structure in Big Lue Mountains north of Clifton. Roofs collapsed and gone, upper walls collapsed. Abundant metal trash. Condition fair; collecting, weathering and trampling by cattle moderate.		C	Arizona
6	9	Two-room ranch house, line shack and double corral in the Big Lue Mountains east of Clifton. Wood frame house is standing and has been used recently. Wooden shed at site has collapsed. Other features and much trash intact. Condition good; collecting in past, shed collapsed.		B	Private
	55	3-4 room ranch house and holding pasture in Big Lue Mountains northeast of Three Way. House is wood frame and remains standing. Small trash dump near house. Condition good; collecting in past.		B	Private
	59	Collapsed ranch house in Big Lue Mountains east of Clifton. Pre-1930 trash around wood frame house and remains of recent use of site are present. Condition fair; house collapsed, slight collecting in past.		C	Private
	60	Dual component ranching site northeast of Three Way containing the sparce remains of a collapsed wood frame house and a large trash dump. Recent use evidenced by an abandoned windmill, 2 concrete water troughs, and scattered equipment and trash. Condition poor; very little remains of disturbed house, weathering, recent use.		C	Private
7	22	One room ranch house in Gila Mountains southwest of Clifton constructed of stone with a dirt floor. Site may be a homestead. Condition good; collecting in past.		B	Private
	26	Large wooden water wheel on Gila River southwest of Clifton. Wheel was used to raise water from the river into an irrigation ditch. Condition good; base is buried by deposition.	Yes	A	Private
	27	Abandoned ranch house in the Gila Mountains southwest of Clifton. Large wood frame house has burned and collapsed. Small wooden shed, corral and wire yard fence present with abundant trash and farm equipment. Condition poor; house burned and collapsed, collecting.		C	Public Lands
	28	Small abandoned ranch house and fenced pasture in the Gila Mountains southwest of Clifton. House is adobe with tin roof. Condition good; house standing but in ill repair.		C	Public Lands
	29	Two partially collapsed miners' houses and a walled in cliff overhang in the Gila Mountains southwest of Clifton. Houses are of stone with dirt floors, roofs gone, walls partially collapsed. Shallow ore test hole at site. Condition fair; slight erosion and deposition, slight disturbance by cattle trail.		C	Public Lands
	38	Gillard Hot Springs on the Gila River southwest of Clifton. Only remains of this once famous hot springs are 2 concrete foundations, the sandy beach, the hot springs, and the access road. Condition poor; deposition of sand by wind great, slight erosion by river.	Yes	C	Public Lands
8	82	Abandoned rhyolite quarry and work area southeast of Clifton. Large quarry area on talus slope. Work area nearby contains scattered fragments of shaped rhyolite bricks, sparce board and tin fragments, pre-1930 glass and recent camp remains. Condition good; slight gully washing, collecting in past.		B	Arizona
	84	Collapsed house southeast of Clifton. Remains include a few scattered boards from house, toys, 3 ore boxes, and small piles of manganese ore. Condition poor; remains sparce, collecting in past.		C	Arizona
9	62	Collapsed corral and possible house remains in the Big Lue Mountains northeast of Three Way. Sparce remains include scattered boards and tin and pre-1930 broken glass. Condition poor; jeep road crosses site, presently used corral on site, remains scattered.		C	Private
	63	Multi-component ranching site in the Big Lue Mountains northeast of Three Way comprised of an early scatter of board fragments, glass, tin cans and other trash, and a terraced house mound. An abandoned chicken coop and currently used windmill and water trough are present. Condition poor; remains sparce and mixed, slight trampling by cattle, past collecting.		C	Private

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

APPENDIX H (cont.)

Allot-ment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Owner-ship Status
	64	Possible structure in the Big Lue Mountains northeast of Three Way. Site contains a pile of weathered boards, sparce glass and tin cans and other trash. Condition poor; heavy trampling by cattle, presently used corral,windmill, and dirt road on edge of site, 2 large rodent holes.		C	Private
12	46	Dual-component site in Big Lue Mountains east of Three Way consisting of a home-stead house built in 1898 and a presently used ranch house, corrals and windmill. All remains of homestead consist of a pile of metal and other trash and horse-drawn wagons. Condition poor; early remains piled up, present occupation has disturbed remains, weathering.		C	Private
	50	Homestead near the Big Lue Mountains northeast of Three Way. Site consists of a collapsed wood frame house with abundant and diverse trash. A corral and spring are nearby. Condition good; no collecting in past, abundant remains, slight sheet wash and weathering.	Yes	C	Public Lands
13	39	Two-room stone and adobe brick miner's house in the Big Lue Mountains east of Three Way. House is standing and in good condition. Trash and household items abundant. A forge is also present. Condition good; slight weathering, probable collecting.	Yes	C	Public Lands
	40	Mine office and house in New Mexico in Big Lue Mountains east of Three Way. Large stone masonry house was used as an office for a large mine nearby. Out-building and equipment present. Condition fair; house in good condition except one outside wall knocked out.	Yes	B	Private
	41	Destroyed miner's house in New Mexico in Big Lue Mountains east of Three Way. Large "L" shaped stone and wood house had collapsed prior to destruction. Trash dump contains abundant hole-in-the-top tin cans. Condition poor; entire house pushed into a pile by a bulldozer and entire site except trash dump bladed.		C	Private
	42	Partially collapsed miner's house in New Mexico in the Big Lue Mountains east of Three Way. House walls of large shaped granite stone are standing. Tin roof collapsed and remains sparce. Trash very sparce. Condition poor; slight deposition and weathering.		C	Public Lands
14	71	Collapsed miner's house and 2 small manganese mines near the Summit Mountains north of Duncan. Remains sparce and include collapsed board walls and roof and a few household items. Condition poor; house collapsed, past collecting.		C	Public Lands
	72	Two manganese mines and a haul road near the Summit Mountains north of Duncan, Large timber A frame over a mine, a terraced platform and beams are present at the other mine. An abandoned road runs from the site past site No. 71 and on toward the Gila Valley. Condition fair; weathering of wood and tin, remains sparce.		C	Private
15	51	Abandoned ranch house, shed and corral in New Mexico in the Big Lue Mountains east of Three Way. Wood-frame house used until recently, corral still in use. Old stone foundation is present. Condition good; no adverse impacts present.		C	Private
21	61	Abandoned ranch house southeast of Three Way with sparce trash scatter. House is of large stone masonry with wood and tin roof. Porch roof has collapsed. Condition good; collecting in past, slight weathering.		C	Public Lands
22	52	Small stone masonry miner's house and mine in the Summit Mountains northeast of Duncan. Upper walls and roof of house have collapsed. Very sparce architectural and trash remains. Condition poor; heavy sheet wash, dirt road cuts through trash dump, remains sparce.		C	Private
	53	Norman King mines, mill and camp in the Summit Mountains northeast of Duncan. Site contains 2 deep mine shafts, 3 horizontal mine drifts, 2 stone masonry houses, 1 stone explo-sives shed and 1 small stone structure. Remains of small mill consist of concrete pads. Trash sparce. Condition good; erosion and weathering slight.	Yes	B	Public Lands, Private
	54	Billalli mine and mill in the Summit Mountains northeast of Duncan. Site contains 3 florspar mine shafts with standing timer A frames, 1 open hori-zontal drift with timber tower, and 2 abandoned haul roads. Mines operated from 1919-1927 and Franklin D. Roosevelt wasone of its engineers. Mill remains consist of concrete foundations and pads and rock bordered terraces. Condition fair; nearly all portable remains are gone, moderate weathering.	Yes	C	Private
	56	Destroyed miner's house in the Summit Mountains in New Mexico northeast of Duncan. House was a small wood frame structure with small trash dump. Condition poor; house destroyed by bulldozer, trash pile undisturbed.		C	Private
	57	Collapsed 2-room structure, abandoned road and stone enclosures in the Big Lue Mountains east of Three Way. Structure remains consist of stone foundation and sparce trash. Stone enclosures appear to have been sheep pens. Road was terraced with stone walls. Pre-1930 trash present. Condition fair; sections of road des-troyed by gully washing and sheet wash, all bottles crushed by vandals.	Yes	B	Public Lands
24	5	Enterprise canal near Gila River east of Safford. Construction began in 1885, one of area's first canals. Portions of 15-mile route still visible. Canal also crosses allotment No. 25. Condition poor; most of route destroyed by development of area.		C	Public Lands
26	1	Tollroad and toll station through the Peloncillo Mountains from the Safford Valley to near Three Way. Road was used from 1899-1919 to haul produce, etc. to the mining town of Clifton. Road also used for a stage line. Collapsed station is in this allotment and the road crosses allotments Nos. 19, 25, 26, and 27. Condition poor; station has collapsed and has been dug by collectors; road washed out by sheet wash and gully washing in places, present highway follows portions of route.	Yes	A	Public Lands, Arizona, Private
30	45	Two mines and collapsed miner's house near Peloncillo Mountains northeast of Duncan. Wood-frame house remains sparce, tin cans abundant, mines are vertical shafts. Condition fair; collecting in past.		C	Arizona
32	43	Abandoned ranch house in the Peloncillo Mountains northwest of Duncan. Remains of collapsed wood-frame house sparce, trash abundant. Condition poor; house remains sparce, collecting in past.		C	Arizona
	44	Abandoned mines and mill in the Peloncillo Mountains northwest of Duncan. Remains consist primarily of concrete mill pads. Condition poor; remains sparce, collecting in past.		C	Public Lands, Private

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

APPENDIX H (cont.)

Allot-ment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Owner-ship Status
36	34	Two partially collapsed adobe ranch structures in New Mexico in Summit Mountains northeast of Duncan. 4-room house with double fireplace and 1-room structure present with limited trash. Condition good; continuous weathering of structures.		C	Private
	35	Collapsed ranch house in New Mexico in Summit Mountains northeast of Duncan. Remains of wood-frame house sparce, glass and metal trash sparce. Condition poor; remains weathered and sparce.		C	Private
43	19	Fort Cummings temporary camp and rifle range in New Mexico southeast of Duncan. Only remains are a few 1882 rifle cartridge cases. Condition good; no disturbances.		B	Public Lands
	49	Temporary Civilian Conservation Corps camp near the Peloncillo Mountains south of Duncan consisting of cobble bounded trails connecting 7 tent circles of cobbles and 3 concrete foundations. Condition fair; artifacts rare; slight trampling by cattle.	Yes	C	Private
	65	Southern Pacific Railroad station of Summit in New Mexico southeast of Duncan. Site contains concrete foundation of 3 structures, several small concrete slabs, 1 large trash dump, and scattered trash. Condition fair; extensive digging by vandals in trash dump, dirt road and fence cross site.	Yes	B	Private
44	2	Butterfield Overland Stage Line, which operated from 1857-1861 and crossed ES area from east of New Mexico State line northeast of San Simon to Fort Bowie and on to near Willcox enroute to Tucson. Route crossed allotment Nos. 44, 69, 98, 75, and 78. 3 stage stations are in the ES area. Condition poor; much of route undetectable, stations from poor to fair condition.	Yes	B	Public Lands, Arizona, New Mexico, Private National Park Service
	47	A Civilian Conservation Corps camp near the Peloncillo Mountains south of Duncan containing an adobe brick structure with no roof, wood structure with tin roof, collapsed stone and concrete pit, a concrete water tank, 1 concrete foundation and several terraces. Trash is rare. Condition fair; ranch headquarters, dirt road, weathering, and collectors have disturbed site.	Yes	C	Public Lands, Private
	48	Small partially collapsed stone structure near the Peloncillo Mountains south of Duncan. Wall stubs remain, no roof or other remains. Condition fair; structure badly weathered.		C	Public Lands
46	77	Solomon to Bowie and San Simon freight road used in 1884 to transport produce by wagon from the Safford Valley. Route is approximately 56 miles long and crosses allotment Nos. 46, 53, 55, 57, 58, 59, 62, and 68. Condition good; most of route visible, except near ends, portions washed out, small portion used at present as dirt road.	Yes	B	Public Lands, Arizona, Private
48	20	Wright Monument and massacre site near Peloncillo Mountains east of Safford. Two brothers were killed here in 1885 by Indians they were pursuing for stealing horses. Condition good; no remains other than an old and a new stone monument.		A	Public Lands
	21	Parks Ranch-Whitlock Spring located between the Whitlock and San Simon Valleys northeast of Bowie. Adobe ranch house partially collapsed. Site was early ranch headquarters and stopover for freight road from 1870s to 1916. Condition poor; walls weathering and rapidly collapsing, cellar dug extensively by collectors, site heavily collected.	Yes	B	Private
	32	Pueblo Viejo Valley inventoried by the Historical Sites Committee and early archaeologists and historians. Site covers many allotments and is bounded by the Gila Mountains on the north, the San Simon Valley on the south, the Whitlock Mountains on the east and the Pinaleno and Santa Teresa Mountains on the west. A very significant and densely populated area in prehistoric and historic times. Condition poor; extensive agricultural and urban development since early 1900s.		B	Public Lands, Arizona, Private, Indian Reservation
58	86	Posey Place - dual component site in San Simon Valley northeast of Bowie consisting of a homestead and Civilian Conservation Corps camp. All structures appear to be CCC. 1 standing adobe structure, 8 concrete foundations and a trash scatter are present. Condition fair; extensive collecting in past, site bordered by 2 improved dirt roads.	Yes	C	Public Lands
69	75	Abandoned ranch house, barn, and double corral in Peloncillo Mountains northeast of San Simon. Wood frame house has collapsed, wooden barn partially collapsed, wooden rabbit shed standing, corrals in use at present. Rock wall partially encloses site. Architectural remains abundant. Thin trash scatter and a trash dump are present. Condition fair; heavy weathering, collecting in past, dirt road ends on site, moderate trampling by cattle.		C	Public Lands, Arizona
	78	Abandoned ranch house in Peloncillo Mountains northeast of San Simon. Wood frame house is partially collapsed. Sparce trash scatter. Condition fair; structure collapsing and weathering, wash eroding edge of site.		C	Arizona
75	16	Apache Pass located in Chiricahua Mountains south of Bowie. Majority of site is within Fort Bowie National Historic Site. Butterfield Stage route crosses pass as did early emigrant trail. Several battle, Apache massacre, and early mine sites are present. A very significant pass since 1851. Condition good; improved dirt road crosses site, heavy tourist use, some sites interpreted for public.	Yes	A	Public Lands, National Park Service
78	83	Two partially collapsed adobe brick farm or ranch structures in San Simon Valley south of San Simon. 1 structure was a house, both consist of short wall stubs and contain wall fall. Trash sparce. Condition fair; walls melting and collapsing, collecting in past.		C	Private
83	15	Fort Bowie National Historic Site in the Chiricahua Mountains, south of Bowie. Site is on the National Register of Historic Places and is administered by the National Park Service as a tourist site. Site contains the remains (primarily adobe) of 2 military forts, the Butterfield Overland Stage road and a stage station, several battle and massacre sites, and a few archaeological sites. Fort was very significant for its role in the Apache campaigns and for protection provided immigrants. Condition good; ruins are being stabilized, cattle are exclosed, access and visitor use is controlled.	On	A	National Park Service

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

APPENDIX H (cont.)

Allotment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Ownership Status
	91	Bowie Peak Heliograph Station in the Chiricahua Mountains south of Bowie. Remains are very sparce at this station used in 1886 by the army. Station was 1 of 14 built in southeastern Arizona. Site is being nominated to the National Register of Historic Places as a joint nomination with site No. 92. Condition poor; remains sparce, extreme weathering.	Yes	A	Public Lands
	92	Helen's Dome Heliograph Station near Fort Bowie and site No. 91. Communications station was part of a 14 station system used in 1886. See discussion of site No. 91. Condition poor; remains sparce, extreme weathering.	Yes	A	Public Lands
	93	Marble quarry in the Chiricahua Mountains south of Bowie. Extensive remains include a large quarry pit, a large wooden mill which is mostly standing, several house mounds, abundant sheets and blocks of marble, and much equipment. Quarry was operated in the early 1900s. Condition good; moderate weathering of mill, some collecting of marble and relics.	Yes	A	Private
92	18	Galeyville - an abandoned mining town in the Chiricahua Mountains west of Portal. Site is in Historic Sites Committee inventory. Town was a silver boom town occupied from 1881-1882 and ranked second only to Tombstone as southeastern Arizona's leading town. Only a few foundations remain. Condition poor; remains sparce.	Yes	C	Private
94	95	Hand Grave and Museum near the Chiricahua Mountains near Portal. E. J. Hand was an early pioneer, rancher, miner and amateur archaeologist who settled in the area in 1887. Condition good; site protected and maintained.		A	Private
117	37	Collapsed remains of rock walls in the Dripping Springs Mountains northwest of Winkelman. Wall stubs of several "rooms" and a compound type wall are present on a terraced slope. A stone well remains standing. Site function unknown, local residents believe it was a Spanish mission. No artifacts. Condition fair; walls mostly collapsed, apparent collecting in past, jeep road crosses compound wall.		B	Arizona
118	6	Carson's Old Trail - mountain pass between the Mescal and Dripping Springs Mountains north of Winkelman used by Kearny's Army of the West enroute to California in 1846. Kit Carson was their guide. A monument has been erected at the site. Condition good; paved highway crosses pass.		B	Public Lands, Arizona, Private
123	30	Christmas - early mining town and mines in the Dripping Springs Mountains northeast of Winkelman. Only remains of town are a saloon building and a cemetery. Condition poor; current mining operations have destroyed most of town, mine sites, and mill remains.		C	Private
130	79	Abandoned mine, mill, and miner's house in the Santa Teresa Mountains north of Klondyke. Adobe brick house walls are standing and windows are present. Roof is gone. Mill remains consist of 4 concrete pads. Mine is horizontal adit. Trash sparce. Condition good; jeep road crosses site, collecting in past, mill remains very sparce.		C	Private
	81	Mining town of Aravaipa in the Santa Teresa Mountains north of Klondyke. Post office established in 1883 under name of Dunlap, discontinued in 1893. Town contains a minimum of 4 abandoned houses, 2 mines with wooden towers and 1 occupied house. Condition fair; collecting in past, weathering, some houses being destroyed at present.	Yes	C	Private
136	74	Salazar homestead near Aravaipa Creek in the Aravaipa Canyon Primitive Area. Remains of this early homestead include a collapsed house and sparce trash. Site was nominated to the National Register of Historic Places in 1976. Condition fair; collecting in past, weathering, heavy visitor use.	Yes	B	Public Lands
139	87	Camp Grant Massacre site near Aravaipa Creek east of the San Pedro River. Site where 108-150 Apache men, women and children were massacred by a group of Tucson Anglos, Mexicans, and Papago Indians in 1871. Remains consist of cobble marked graves. No evidence of the Apache camp remains. Condition poor; site has been dug by vandals.	Yes	A	Private
154	31	Large number of cobble check dams and small earthen dams constructed by the Civilian Conservation Corps from 1935-1938 near the Gila Mountains north of Pima. Material was from local sources. Site covers approximately 30 square miles. Site extends into allotments Nos. 155-158. Condition good; some features eroded from gully washing.	Yes	B	Public Lands
163	69	A major Civilian Conservation Corps camp near the Gila River northeast of Safford. 5 buildings of concrete and stone are present. Walls are standing, roofs, doors, windows, and all wood has been removed. Rock bordered trails and tent areas are extensive. Condition good; a stone monument or shrine has been partially destroyed by vandals.	Yes	B	Public Lands
164	70	Partially abandoned town of Sanchez near the Gila River east of Safford. Town contains several adobe houses, a school, church and cemetery. Condition fair; vandalized school and church have been fenced, access road to houses has a locked gate.	Yes	B	Private
166	4	Kearny Campsite and Trail near the Gila River northeast of Safford. Site is on the National Register of Historic Places. Site was used in 1846 by Colonel John Kearny, Kit Carson his guide, and the Army of the West enroute to California to participate in the Mexican War. There are no visible remains at the site. A stone monument has been erected by the Graham County Historical Society. Condition fair; vandalism in past to the monument, no other impacts.	On	A	Public Lands
167	85	Small 1-room stone structure in the Gila Mountains northeast of Safford. Walls are partially collapsed, no roof, trash very sparce. Condition fair; collecting in past, weathering.		C	Public Lands

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair

APPENDIX H (cont.)

Allot-ment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Owner-ship Status
181	80	Spenazuma - an abandoned mining town and 2 mines near the Santa Teresa Mountains southwest of Fort Thomas. Town was built in 1898 as part of one of the nation's most infamous swindles. Remains of a fake gold mill and the mounds of several small structures remain. Condition fair; most structures collapsed or not visible, collecting in past.	Yes	B	Private
182	88	Several abandoned mines near the Santa Teresa Mountains southwest of Fort Thomas. 1 open mine drift (horizontal) and several small test pits present. Trash sparce. Condition fair; weathering moderate, remains sparce.		C	Public Lands
190	94	Ash Creek Flume - a collapsed lumber flume and trestle in the Pinaleno Mountains south of Pima. Flume was operated for 3-7 years beginning in 1907-1910 and was 9 miles long. Remains sparce as timber was salvaged. Site also crosses allotments Nos. 191 and 192. Condition poor; remains sparce, route followed a stream.		B	Public Lands, National Forest, Arizona, Private
The following sites are not in allotments.					
	8	Farm community of Virden, New Mexico near the Gila River southeast of Duncan. Post office built in 1875. Name changed from Richmond in 1916 when Mormons settled area. Town is still occupied. Site is in New Mexico's Historic Sites Committee inventory. Condition poor; early structures collapsed or were replaced with modern ones.		C	Private
	10	Farm community of Apache Grove on the Gila River north of Duncan. Site began as a camp for Apache raiding parties in the 1880s. Town is occupied at present. Site is in New Mexico Historic Sites Committee inventory. Condition poor; no early remains evident due to present structures and development.		A	Private
	11	Clifton, Arizona - established in 1872 as a mining town is occupied at present as a thriving copper mining community. Site is on New Mexico Historic Sites Committee inventory. Condition good; many early homes and businesses are in good condition and still in use.	Yes	B	Private
	12	Clifton jail built in Clifton in 1881 by the builders of the area's first copper smelter. Jail consisted of a tunnel in solid rock faced with stone. Site is on Historic Sites Committee inventory. Condition good; site is maintained and fenced.		B	Private
	13	Mining town of Morenci, Arizona, located near Clifton. Built in 1870s on the site of a mining camp, the present town and open pit copper mines and smelter of the Phelps Dodge Company have completely replaced the early town. Site is on Historic Sites Committee inventory. Condition poor; destroyed by development and mining beginning in 1937.		B	Private

Allot-ment No.	Site No.	Site Description/Condition/Impacts	National Register Quality	Recreation Quality Rating	Owner-ship Status
	17	Mining town of Paradise, Arizona west of Portal. Sprang up in 1888, boomed in 1901, mostly abandoned by 1943. Had over 300 people and 13 saloons at the crest of its boom. A few houses are still occupied. Condition poor; little remains of early town, weathering.	Yes	B	Private
	33	Military post of Fort Thomas near present town of that name. Built in 1876 to replace Fort Goodwin. Primary duties were to pursue hostile Apaches and contain the reservation Indians. Fort was closed in 1892. Only 3 completely collapsed structures, structure mounds, trash dumps and sparce scattered trash are evident today. Condition poor; structures mostly destroyed by weathering, extensive digging by vandals at present. Post cemetery is occasionally maintained.	Yes	B	Private
	73	Forest Service office ruins near Aravaipa Creek south of Klondyke. Ranger station was occupied from 1915 to about 1930. 1 large structure with a concrete foundation and a small segment of an adobe brick wall stub remains with a second small structure evidenced only by a deteriorated concrete foundation. Trash is very sparce. Condition poor; heavy weathering, collecting in past.		C	Public Lands
	89	One room historic structure south of Duncan. Only structural remains are the cobblestone foundation. Structure had wood walls and a tin roof. Trash sparce. Condition poor; heavy weathering, collecting in past.		C	Arizona
	96	Military post of Camp Grant (originally Fort Breckenridge) on the San Pedro River near Aravaipa Creek. Post was established in 1856 by the California Volunteers to protect the southern route to California from Apache raiders. Post was abandoned in 1872. Condition poor; no structures remain, site destroyed by recent development.		C	Private
	97	Military post of Fort Goodwin west of Fort Thomas. Built in 1864 by Henry C Hooker as a base for operations against hostile Apaches. Post abandoned in 1871 and replaced by Fort Thomas because of unhealthy living conditions. Condition poor; fort destroyed by farming.		C	Private
	98	Partially standing house south of Safford. 2 walls of sandstone block are standing, scattered trash is present. House built in 1880s and occupied by Marijilda Grijalva, a famous army scout during the Apache campaigns. He moved to Solomonville before 1900. Condition poor; standing walls are weathering, some digging by vandals near house.		B	Private
	100	Indian Hot Springs - a series of hot springs northwest of Pima. First used by Fort Thomas and Fort Goodwin soldiers, pioneers and Indians. 2-story 30-room stone and brick hotel built in 1902. Large swimming, etc., pool added in 1916. Private health commune at present. Condition good; maintained by owners.	Yes	*	Private

Recreation Quality Ratings: A--Excellent, B--Good, C--Fair
*Site not rated

APPENDIX I

SUMMARY OF LIVESTOCK OPERATIONS IN ES AREA

GRAZING UNIT NO.	ALLOTMENT		LIVESTOCK USE		SEASON OF USE		% PUBLIC LANDS	PUBLIC LANDS AUMS	TYPE BASE
	No.	Name	No.	Class	From	To			
1	5001	Metcalf	25*	Cattle	3/01/76	2/28/77	100	300	Water
2	5002	San Francisco	100	Cattle	3/01/76	2/28/77	72	864	Water
			4	Horses				35	
3	5003	Slash Hook	276	Cattle	3/01/76	2/28/77	20	663	Water
			10	Horses				24	
3	5010	Slash Hook	6	Cattle	3/01/76	2/28/77	100	72	Water
4	5004	Hickey	12	Cattle	3/01/76	2/28/77	60	87	Water
			10	Horses				72	
5	5005	Limestone Canyon	32	Cattle	3/01/76	2/28/77	30	115	Water
5	5009	Limestone Canyon	40	Cattle	3/01/76	2/28/77	56	269	Water
6	5007	Willcross	34	Cattle	3/01/76	2/28/77	33	135	Water
			2	Horses				8	
			24	Non-use				96	
6	5008	Willcross	100	Cattle	3/01/76	2/28/77	19	227	Water
			4	Horses				10	
7	5010	Gila	3	Cattle	3/01/76	2/28/77	100	36	Water
7	5011	Gila	300	Cattle	3/01/76	2/28/77	76	2,736	Water
			2	Horses				18	
7	5014	Gila	12	Cattle	3/01/76	2/28/77	81	117	Water
			4	Horses				39	
8	5012	Clifton	145	Cattle	3/01/76	2/28/77	15	261	Water
9	5013	Airport	185	Cattle	3/01/76	2/28/77	23	511	Water
			15	Horses				42	
10	5015	Three-way	1	Cattle	3/01/76	2/28/77	80	10	Water
			2	Horses				20	
11	5016	Lebar	4	Non-use	3/01/76	2/28/77	100	48	Water
12	5017	Hoverrocker	200	Cattle	3/01/76	2/28/77	38	912	Water
			15	Horses				69	
13	5018	Twin Peaks	65	Cattle	3/01/76	2/28/77	52	328	Water
14	5019	Combine	4*	Cattle	3/01/76	2/28/77	100	48	Water
14	5037	Combine	115	Cattle	3/01/76	2/28/77	34	470	Water
14	5051	Combine	20	Cattle	3/01/76	2/28/77	92	221	Water
14	5052	Combine	35	Cattle	3/01/76	2/28/77	40	168	Water
14	5057	Combine	101	Cattle	3/01/76	2/28/77	27	328	Water
15	5020	Apache Creek	29*	Cattle	7/01/76	10/30/76	100	116	Water
16	5021	Black Canyon	200	Cattle	3/01/76	2/28/77	96	2,304	Water
			8	Horses				93	
17	5022	County Line	140	Cattle	3/01/76	2/28/77	100	1,680	Water
18	5023	Buck Canyon	50	Cattle	3/01/76	2/28/77	89	534	Water
			2	Horses				22	
19	5024	Harper	25	Cattle	3/01/76	2/28/77	89	267	Water
			25	Non-use				267	
20	5025	Rocky John	36	Cattle	3/01/76	2/28/77	42	182	Water
			1	Horses				6	
21	5026	Web	70	Cattle	2/14/75	10/30/76	34	202	Water
22	5028	Summit Community	77	Cattle	3/01/76	2/28/77	39	361	Water
			4	Horses				19	
22	5029	Summit Community	100	Cattle	3/01/76	2/28/77	63	756	Water
			12	Non-use				91	
23	5030	Blue Creek	10*	Cattle	3/01/76	2/28/77	100	120	Water
24	5031	San Jose Community	2	Cattle	3/01/76	2/28/77	100	24	Water
25	5032	Yuma Wash	24	Cattle	3/01/76	2/28/77	88	254	Water
26	5033	Tollgate	90	Cattle	3/01/76	2/28/77	93	1,005	Water
			5	Horses				56	
			18	Non-use				201	
27	5034	Guthrie Peak	46	Cattle	3/01/76	2/28/77	77	425	Water
			2	Horses				19	
			41	Non-use				379	
28	5035	Sheldon Mountain	248	Cattle	3/01/76	2/28/77	72	2,143	Water
28	5044	Sheldon Mountain	456	Cattle	3/01/76	2/28/77	57	3,119	Water
29	5036	Sanders Wash	10	Cattle	3/01/76	2/28/77	33	40	Water
30	5038	China Camp	20	Cattle	3/01/76	2/28/77	24	58	Water
30	5043	China Camp	60	Cattle	3/01/76	2/28/77	82	591	Water
31	5039	Croom	39	Cattle	3/01/76	2/28/77	82	384	Water
31	5040	Croom	20*	Cattle	3/01/76	2/28/77	100	240	Water
32	5041	Rhyolite Peak	171	Cattle	3/01/76	2/28/77	28	575	Pref-
			6	Horses				21	erence lands
33	5042	Sandia	10	Cattle	3/01/76	2/28/77	80	96	Water
			2	Horses				20	
34	5045	Charlie Hill	45	Cattle	3/01/76	2/28/77	62	335	Water
			3	Horses				23	
35	5046	Sand Wash	15	Cattle	3/01/76	2/28/77	46	83	Water
36	5048	Carlisle	300	Cattle	3/01/76	2/28/77	63	2,268	Water
			12	Horses				91	
			45	Non-use				340	
37	5049	Woods Canyon	220	Cattle	3/01/76	2/28/77	58	1,532	Water
38	5050	Horse	1	Horse	3/0176	2/28/77	100	12	Water
39	5053	Gale	10	Cattle	3/01/76	2/28/77	20	24	Water
40	5054	Franklin	11	Cattle	3/01/76	2/28/77	19	26	Water
			2	Horses				5	
41	5055	State Line	35	Cattle	3/01/76	2/28/77	83	349	Water
42	5056	Pearson Mesa	24	Cattle	3/01/76	2/28/77	50	144	Water
43	5058	Lazy "B"	1,996	Cattle	3/01/76	2/28/77	67	16,048	Water
			33	Horses				266	
44	5059	Horseshoe	110	Cattle	3/01/76	2/28/77	70	924	Water
			2	Horses				17	
44	5060	Horsehoe	130	Cattle	3/01/76	2/28/77	68	1,061	Water
44	5062	Horsehoe	80	Cattle	3/01/76	2/28/77	58	557	Water
			3	Horses				21	
45	5061	Little Doubtful	49	Cattle	3/01/76	2/28/77	79	465	Water
			2	Horses				19	
46	5101	Creosote	112	Cattle	3/01/76	2/28/77	81	1,089	Water
47	5102	Munson Cienega	0	---	----Ephemeral---		31	---	Water
48	5103	Hackberry	250*	Cattle	3/01/76	2/28/77	100	3,000	Water
			10*	Horses				120	
49	5104	Chimney	70	Cattle	3/01/76	2/28/77	24	202	Water
			2	Horses				6	
			10	Non-use				29	
50	5105	Ash Peak	100	Cattle	3/01/76	2/28/77	83	996	Water
			6	Horses				60	
51	5106	Artesia	13	Cattle	3/01/76	2/28/77	83	129	Water
			16	Non-use				159	
52	5107	Stockton Pass	275	Cattle	6/01/76	11/30/76	35	578	Water
53	5108	Tanque	100	Cattle	3/01/76	2/28/77	94	1,128	Water
			150	Cattle	4/01/76	2/28/77		978	

***This number does not reflect total livestock numbers on the allotment. It indicates only those livestock licensed on public lands.**

APPENDIX I (cont.)

GRAZING UNIT NO.	ALLOTMENT No.	ALLOTMENT Name	LIVESTOCK USE No.	LIVESTOCK USE Class	SEASON OF USE From	SEASON OF USE To	% PUBLIC LANDS	PUBLIC LANDS AUMS	TYPE BASE
54	5109	Van Gausig	125	Cattle	3/01/76	2/28/77	79	1,185	Water
55	5110	Badger Den	196	Cattle	3/01/76	10/31/76	76	1,192	Water
			2	Horses				13	
55	5113	Badger Den	40	Cattle	3/01/76	2/28/77	88	423	Water
			50	Non-use				528	
			1	Horse				11	
			1	Non-use				11	
56	5111	Poppy Canyon	94	Cattle	3/01/76	2/28/77	29	328	Water
			4	Horses				14	
57	5112	Fisher	200	Cattle	3/01/76	2/28/77	34	816	Water
			7	Horses				29	
			140	Non-use				571	
58	5114	Fan	150	Cattle	3/01/76	2/28/77	100	1,800	Water
			3	Horses				36	
59	5115	Joy Valley	417	Cattle	3/01/76	2/28/77	76	3,803	Water
60	5116	Midway Canyon	70	Cattle	3/01/76	2/28/77	66	555	Water
			4	Horses				32	
61	5117	Hilburn	6	Cattle	5/01/76	6/30/76	75	27	Water
			8	Cattle	8/01/76	10/31/76			
62	5118	Murchison	287	Cattle	10/01/75	6/30/76	95	2,455	Water
			2	Horses				18	
63	5119	Flying "W"	125	Cattle	3/01/76	2/28/77	53	795	Water
64	5120	Polecat	32*	Cattle	3/01/76	2/28/77	100	384	Water
65	5121	Bowie	----Cancelled 6/18/75----				---	---	Water
66	5122	Garret	287	Cattle	7/01/76	9/30/76	41	353	Water
			2	Horses				3	
67	5123	Homestead	1*	Cattle	3/01/76	2/28/77	100	12	Water
68	5124	San Simon	4	Cattle	5/01/76	2/28/77	100	40	Water
			2	Cattle	12/01/76	2/28/77		6	
			2	Horses	7/01/76	11/30/76		10	
69	5125	Roostercomb	185	Cattle	3/01/76	2/28/77	60	1,392	Water
			2	Horses				15	
70	5126	Camelsback	8*	Cattle	3/01/76	2/28/77	100	96	Water
71	5127	Cedar Springs	60	Cattle	3/01/76	2/28/77	39	281	Water
			2	Horses				10	
72	5128	Dos Cabezas Community	85	Cattle	3/01/76	2/28/77	72	735	Water
72	5129	Dos Cabezas Community	25	Cattle	3/01/76	2/28/77	68	204	Water
72	5130	Dos Cabezas Community	60	Cattle	3/01/76	2/28/77	65	468	Water
73	5131	Rough Mountain	170	Cattle	3/01/76	2/28/77	63	1,286	Water
74	5132	Happy Camp	30	Cattle	3/01/76	2/28/77	86	310	Water
			4	Horses				42	
			9	Non-use				93	
75	5133	Silverstrike Community	95	Cattle	3/01/76	2/28/77	75	855	Water
75	5143	Silverstrike Community	120	Cattle	3/01/76	2/28/77	46	662	Water
			60	Non-use	3/01/76	2/28/77		331	
76	5134	Emigrant Canyon	3*	Cattle	3/01/76	2/28/77	100	36	Water
77	5135	Portal Road	2	Cattle	3/01/76	2/28/77	100	24	Water
78	5136	Oil Well	13	Non-use	3/01/76	2/28/77	47	56	Water
79	5138	Vanar	100	Cattle	3/01/76	2/28/77	89	1,068	Water
80	5139	Ivanhoe	24	Cattle	3/01/76	6/30/76	60	58	Water
			36	Cattle	7/01/76	12/31/76		126	
			24	Cattle	1/01/77	2/28/77		29	
80	5140	Ivanhoe	36*	Cattle	7/01/76	12/31/76	100	216	Water

GRAZING UNIT NO.	ALLOTMENT No.	ALLOTMENT Name	LIVESTOCK USE No.	LIVESTOCK USE Class	SEASON OF USE From	SEASON OF USE To	% PUBLIC LANDS	PUBLIC LANDS AUMS	TYPE BASE
81	5141	Siphon Canyon	27	Cattle	3/01/76	2/28/77	48	156	Water
82	5142	Nine Mile	2*	Cattle	3/01/76	2/28/77	100	24	Water
83	5144	Apache Springs	175	Cattle	3/01/76	4/30/76	95	333	Water
			175	Cattle	11/01/76	2/28/77		665	
84	5145	Mulkins	20*	Cattle	5/01/76	10/31/76	100	120	Water
85	5146	Saltbush	12	Cattle	3/01/76	10/31/76	47	45	water
86	5148	El Paso	1	Cattle	3/01/76	2/28/77	100	12	Water
87	5149	Realty	3	Cattle	3/01/76	2/28/77	100	36	Water
88	5150	Whitetail	75	Cattle	3/01/76	2/28/77	63	567	Water
90	5153	Blue Mountain	50	Cattle	5/01/76	10/31/76	59	177	Water
			30	Non-use				106	
90	5154	Blue Mountain	74	Cattle	3/01/76	2/28/77	15	133	Water
			2	Horses				4	
			18	Non-use				32	
90	5155	Blue Mountain	35	Cattle	3/01/76	2/28/77	44	185	Water
90	5156	Blue Mountain	8	Cattle	3/01/76	4/30/76	71	11	Water
			2	Non-use	3/01/76	2/28/77		18	
			45	Cattle	5/01/76	10/31/76		192	
			8	Cattle	11/01/76	2/28/77		23	
91	5157	Midway	17	Cattle	3/01/76	2/28/77	41	84	Water
92	5158	Paradise	14*	Cattle	3/01/76	2/28/77	100	168	Water
93	5159	Contour	--No license since 2/28/73--				---	---	Water
94	5160	Cave	----Cancelled 3/03/75----				---	---	Water
95	5161	King	----Cancelled 2/01/75----				---	---	Water
96	5162	Roberds	---Unallotted allotment---				---	---	Water
97	5163	Rodeo	----Cancelled 3/03/75----				---	---	Water
98	5164	Red Mountain	36	Cattle	3/01/76	2/28/77	100	432	Water
99	5165	Small	1	Cattle	3/01/76	2/28/77	100	12	Water
100	5166	Lindsey	0	---	---Ephemeral---		100	---	Water
101	5167	Foote wash	0	---	---Ephemeral---		50	---	Water
102	5168	Cemetery	----Cancelled 6/06/75----				---	---	Water
103	5169	Gripe	----Cancelled 6/06/75----				100	---	Water
104	5170	Stockton	0	---	---Ephemeral---		100	---	Water
105	5171	Marijaldi	0	---	---Ephemeral---		33	---	Water
105	5172	Marijaldi	1	Cattle	3/01/76	2/28/77	100	12	Preference lands
106	5173	Dankworth	1	Cattle	3/01/76	2/28/77	100	12	Preference lands
107	5174	Gibson	1	Cattle	3/01/76	2/28/77	100	1	Preference lands
108	5175	Swift	----Lease expired 6/10/73 and never renewed----				---	---	Preference lands
109	5176	Royce	1	Non-use	3/01/76	2/28/77	100	12	Water
110	5177	Artwell	2	Cattle	3/01/76	2/28/77	100	24	Water
111	4501	Pioneer Mountain	11*	Cattle	3/01/76	2/28/77	100	129	Preference lands
112	4502	Silver Creek	18*	Cattle	3/01/76	2/28/77	100	216	Preference lands

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APPENDIX I (cont.)

GRAZING UNIT NO.	ALLOTMENT No.	ALLOTMENT Name	LIVESTOCK USE No.	LIVESTOCK USE Class	SEASON OF USE From	SEASON OF USE To	% PUBLIC LANDS	PUBLIC LANDS AUMS	TYPE BASE
113	4503	Pasadena Mountain	34*	Cattle	3/01/76	2/28/77	100	411	Preference lands
114	4504	El Capitan	7*	Cattle	3/01/76	2/28/77	100	89	Preference lands
115	4505	Ponderosa	5*	Cattle	3/01/76	2/28/77	100	54	Preference lands
116	4506	Gilson Wash	7*	Cattle	3/01/76	2/28/77	100	83	Preference lands
117	4507	Dripping Springs	108*	Cattle	3/01/76	2/28/77	100	1,299	Preference lands
118	4508	Limestone	58*	Cattle	3/01/76	2/28/77	100	700	Preference lands
119	4509	Mescal Mountain	67*	Cattle	3/01/76	2/28/77	100	804	Preference lands
120	4510	Hook and Line	81*	Cattle	3/01/76	2/28/77	100	973	Preference lands
121	4511	Christmas	39*	Cattle	3/01/76	2/28/77	100	468	Preference lands
122	4512	Hi-Y	2*	Cattle	3/01/76	2/28/77	100	25	Preference lands
123	4513	Hidalgo	165*	Cattle	3/01/76	2/28/77	100	1,976	Preference lands
124	4514	Piper Springs	16*	Cattle	3/01/76	2/28/77	100	189	Preference lands
125	4515	Gypsum	3*	Cattle	3/01/76	2/28/77	100	39	Preference lands
126	4516	Dudleyville	21*	Cattle	3/01/76	2/28/77	100	247	Preference lands
127	4517	Malpais Hill	12*	Cattle	3/01/76	2/28/77	100	145	Preference lands
128	4518	Painted Cave	41*	Cattle	3/01/76	2/28/77	100	495	Preference lands
129	4519	Hell Hole	2*	Cattle	3/01/76	2/28/77	100	26	Preference lands
129	4520	Hell Hole	30* 2	Cattle Horses	3/01/76	2/28/77	100	360 24	Water
130	4521	Aravaipa	10*	Cattle	3/01/76	2/28/77	100	115	Preference lands
130	4522	Aravaipa	329 250 15	Cattle Cattle Horses	3/01/76 3/01/76 3/01/76	2/28/77 5/31/76 2/28/77	39	1,540 293 71	Water
131	4523	Stanley Butte	9	Cattle	3/01/76	2/28/77	100	108	Water
132	4524	Horse Mountain	16 4	Cattle Horses	3/01/76	2/28/77	100	192 48	Water
133	4525	Laurel Canyon	4*	Cattle	3/01/76	2/28/77	100	53	Preference lands
134	4526	Klondyke	54*	Cattle	3/01/76	2/28/77	100	648	Preference lands
135	4527	Squaw Creek	33*	Cattle	3/01/76	2/28/77	100	390	Preference lands
136	4528	Turkey Creek	31*	Cattle	3/01/76	2/28/77	100	377	Preference lands
137	4529	Panorama	12*	Cattle	3/01/76	2/28/77	100	144	Preference lands
138	4530	Brandenburg Mountain	6*	Cattle	3/01/76	2/28/77	100	68	Preference lands
139	4531	Holy Joe	13*	Cattle	3/01/76	2/28/77	100	150	Preference lands
140	4532	Massacre	15*	Cattle	3/01/76	2/28/77	100	180	Preference lands
141	4533	Zapata	49*	Cattle	3/01/76	2/28/77	100	584	Preference lands
142	4534	Dry Camp	9*	Cattle	3/01/76	2/28/77	100	108	Preference lands
143	4535	Tiger	50	Cattle	3/01/76	2/28/77	100	599	Preference lands
144	4536	Reliable	7*	Cattle	3/01/76	2/28/77	100	80	Preference lands
145	4537	Copper Creek	143*	Cattle	3/01/76	2/28/77	100	1,715	Preference lands
146	4538	Schoenholzer Canyon	65*	Cattle	3/01/76	2/28/77	100	782	Preference lands
147	4539	Hotwell	44*	Cattle	3/01/76	2/28/77	100	530	Preference lands
148	4540	Y.L.E.	28*	Cattle	3/01/76	2/28/77	100	335	Preference lands
149	4541	Kielberg	23*	Cattle	3/01/76	2/28/77	100	276	Preference lands
150	4543	Crystal Cave	4*	Cattle	3/01/76	2/28/77	100	46	Preference lands
151	4601	Diamond Bar	340 10	Cattle Horses	3/01/76	2/28/77	96	3,917 116	Water
152	4602	Tom Springs	100 2	Cattle Horses	3/01/76	2/28/77	97	1,164 23	Water
153	4603	Fort Thomas	0	---	---Ephemeral---		100	---	Water
154	4604	Day Mine	390 300 390 300 10 90 90	Cattle Cattle Cattle Cattle Horses Non-use Non-use	3/01/76 6/01/76 9/01/76 12/01/76 3/01/76 6/01/76 12/01/76	5/31/76 8/31/76 11/30/76 2/28/77 2/28/77 8/31/76 2/28/77	95	1,112 855 1,112 855 114 257 257	Water
155	4605	North Eden Community	0	---	---Ephemeral---		100	---	Water

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APPENDIX I (cont.)

GRAZING UNIT NO.	ALLOTMENT No.	ALLOTMENT Name	LIVESTOCK USE No.	LIVESTOCK USE Class	SEASON OF USE From	SEASON OF USE To	% PUBLIC LANDS	PUBLIC LANDS AUMS	TYPE BASE
156	4606	South Eden Community	0	---	---Ephemeral---		100	---	Water
157	4607	Billingsley Creek	0	---	---Ephemeral---		100	---	Water
157	4644	Billingsley Creek	0	Cattle	---Ephemeral---		100	---	Preference lands
158	4608	Bryce	500 40 180	Cattle Horses Non-use	3/01/76	2/28/77	26	1,560 125 562	Water
159	4609	Kimball Community	0	---	---Ephemeral---		100	---	Water
160	4610	Talley Wash	40 15	Cattle Non-use	3/01/76	2/28/77	66	317 119	Water
161	4611	Skinner Community	0	---	---Ephemeral---		100	---	Water
162	4612	Rest Haven	0	---	---Ephemeral---		100	---	Water
163	4613	Lone Star	175 4	Cattle Horses	3/01/76	2/28/77	71	1,491 34	Water
164	4614	Sanchez	0 0	Cattle Horses	3/01/76	2/28/77	99	0 0	Water
165	4615	Johnny Creek	250 5	Cattle Horses	3/01/76	2/28/77	79	2,370 48	Water
166	4616	Bonita Creek	375 10 89	Cattle Horses Non-use	3/01/76	2/28/77	73	3,285 88 780	Water
167	4617	Bullgap Community	100 40 20	Cattle Non-use Cattle	3/01/76	2/28/77	99	1,188 476 238	Water
168	4618	Turtle Mountain	270 10 45	Cattle Horses Non-use	3/01/76	2/28/77	82	2,657 99 443	Water
169	4619	Geronimo	35	Cattle	9/28/76	11/27/76	69	49	Water
170	4620	Emery	60	Cattle	9/01/76	10/14/76	100	90	Water
171	4621	Alkali	40	Cattle	3/01/76	2/28/77	95	456	Water
172	4622	Fine Wash	0	---	---Ephemeral---		100	---	Water
173	4623	Bench Mark	0	---	---Ephemeral---		100	---	Water
174	4624	North Fort Thomas Community	18 12	Cattle Non-use	3/01/76	2/28/77	100	216 144	Water
175	4625	South Fort Thomas Community	0	---	---Ephemeral---		100	---	Water
176	4626	Red Knolls	0	---	---Ephemeral---		100	---	Water
177	4627	Goodwin Wash	4	Non-use	3/01/76	2/28/77	75	36	Water
178	4628	White Spring	23 2	Cattle Horses	3/01/76	2/28/77	91	252 22	Water
179	4629	Cobre Grande	10	Cattle	3/01/76	2/28/77	63	76	Water
180	4630	Black Rock	35	Cattle	3/01/76	2/28/77	76	320	Water
181	4631	Spenazuma	13 30	Cattle Non-use	3/01/76	2/28/77	73	114 263	Water
182	4632	Holdup Canyon	100 5	Cattle Horses	3/01/76	2/28/77	87	1,044 53	Water
182	4648	Holdup Canyon	4	Cattle	3/01/76	2/28/77	50	24	Water
183	4633	Jackson Mountain	91 5	Cattle Horses	3/01/76	2/28/77	56	612 34	Water
184	4634	White House	146	Cattle	3/01/76	2/28/77	65	1,122	Water
185	4635	Oso Largo	45 17	Cattle Non-use	9/28/76 3/01/76	11/27/76 2/28/77	100	90 204	Water
185	4646	Oso Largo	1	Cattle	9/30/76	2/28/77	100	5	Preference lands
186	4636	Bear Springs	0	---	---Ephemeral---		77	---	Water
187	4637	Pima	0	---	---Ephemeral---		75	---	Water
188	4638	Mesa	0	---	---Ephemeral---		77	---	Water
189	4639	Mud Hollow	0	---	---Ephemeral---		73	---	Water
190	4640	Spear Community	50* 50* 9*	Cattle Cattle Cattle	3/01/76 9/01/76 3/01/76	7/31/76 10/31/76 2/28/77	100	250 100 108	Water
190	4641	Spear Community	11* 32	Cattle Cattle	3/01/76 4/01/76	2/28/77 10/31/76	100 89	132 189	Water
191	4642	Mud Springs Community	30 20	Cattle Cattle	5/01/76 3/01/76	10/31/76 2/28/77	44	80 105	Water
192	4643	Lefthand Canyon	3*	Cattle	3/01/76	2/28/77	100	36	Water
193	4647	Mixed Up	1	Cattle	3/01/76	2/28/77	100	12	Preference lands

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TOTAL AUMs
LICENSED ON PUBLIC LANDS IN FEE YEAR 1976

Cattle	127,642
Horses	2,369
TOTAL	130,011
Non-use	6,933
TOTAL	136,944

APPENDIX J

LICENSED GRAZING USE, 1972-1976 AND 5-YEAR AVERAGE

GRAZING UNIT		1972				1973				1974				1975				1976				5-YEAR AVERAGE			
#	NAME	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total
1	Metcalf	25	300	0	300	25	300	0	300	25	300	0	300	25	300	0	300	25	300	0	300	25	300	0	300
2	San Francisco	106	917	355	1,272	100	864	336	1,200	104	899	349	1,248	104	899	349	1,248	104	899	349	1,248	104	896	347	1,243
3	Slash Hook	356	1,166	3,113	4,279	356	1,166	3,113	4,279	356	1,166	3,113	4,279	408	765	3,060	3,825	292	759	2,745	3,504	353	1,004	3,028	4,032
4	Hickey	47	177	117	294	22	159	105	264	22	159	105	264	22	159	105	264	22	159	105	264	27	162	108	270
5	Limestone Canyon	72	394	470	864	55	299	361	660	68	370	446	816	72	385	479	864	72	384	480	864	68	366	448	814
6	Willcross	100	291	909	1,200	100	291	909	1,200	100	290	910	1,200	100	247	821	1,068	140	380	1,298	1,678	108	300	968	1,268
7	Gila	253	2,368	682	3,050	253	2,368	682	3,050	253	2,368	682	3,050	321	2,946	906	3,852	321	2,946	906	3,852	280	2,599	771	3,370
8	Clifton	95	264	876	1,140	110	305	1,015	1,320	130	234	1,326	1,560	130	234	1,326	1,560	145	261	1,479	1,740	122	260	1,204	1,464
9	Airport	200	553	1,847	2,400	200	553	1,847	2,400	200	553	1,847	2,400	200	553	1,847	2,400	200	553	1,847	2,400	200	553	1,847	2,400
10	Threeway	4	39	9	48	4	39	21	60	5	39	21	60	3	30	6	36	3	30	6	36	4	35	13	48
11	Lebar	5	60	0	60	4	48	0	48	0	0	0	0	0	0	0	0	0	0	0	0	2	22	0	22
12	Hoverrocker	225	1,026	1,674	2,700	175	798	1,302	2,100	215	981	1,599	2,580	215	981	1,599	2,580	215	981	1,599	2,580	209	953	1,555	2,508
13	Twin Peaks	78	488	448	936	78	488	448	936	78	488	448	936	78	488	448	936	65	328	452	780	75	456	449	905
14	Combine	255	1,121	1,939	3,060	265	1,159	2,021	3,180	255	1,079	1,981	3,060	265	1,194	1,986	3,180	275	1,235	2,065	3,300	263	1,158	1,998	3,156
15	Apache Creek	12	144	0	144	36	144	0	144	29	145	0	145	29	116	0	116	29	116	0	116	27	133	0	133
16	Black Canyon	208	2,322	174	2,496	208	2,322	174	2,496	208	2,322	174	2,496	208	2,322	174	2,496	208	2,397	99	2,496	208	2,337	159	2,496
17	County Line	141	1,692	0	1,692	143	1,716	0	1,716	143	1,716	0	1,716	143	1,716	0	1,716	140	1,680	0	1,680	142	1,704	0	1,704
18	Buck Canyon	58	577	69	646	52	557	67	624	30	261	33	294	67	715	89	804	52	556	68	624	52	533	65	598
19	Harper	40	428	52	480	50	534	66	600	50	534	66	600	25	267	33	300	25	267	33	300	28	406	50	456
20	Rocky John	37	188	256	444	49	196	266	462	37	188	256	444	37	188	256	444	37	188	256	444	39	190	258	448
21	Web	76	207	401	608	76	207	401	608	100	204	396	600	102	209	403	612	70	202	393	595	85	206	399	605
22	Summit Community	101	456	636	1,092	111	604	708	1,312	183	1,152	1,044	2,196	181	1,136	1,036	2,172	181	1,136	1,036	2,172	135	897	891	1,788
23	Blue Creek	10	120	0	120	10	120	0	120	10	120	0	120	10	120	0	120	10	120	0	120	10	120	0	120
24	San Jose Community	2	24	0	24	2	24	0	24	2	24	0	24	2	24	0	24	2	24	0	24	2	24	0	24
25	Yuma Wash	79	303	150	453	79	303	150	453	40	120	0	120	24	254	34	288	24	254	34	288	49	247	73	320
26	Tollgate	113	1,264	92	1,356	113	1,264	92	1,356	73	816	60	876	95	1,061	79	1,140	95	1,061	79	1,140	98	1,093	81	1,174
27	Guthrie Peak	110	748	483	1,231	136	1,003	297	1,300	93	861	255	1,116	20	185	55	240	48	444	132	576	81	648	244	892
28	Sheldon Mountain	591	4,380	2,712	7,092	725	5,456	3,244	8,700	723	5,437	3,239	8,676	723	5,437	3,239	8,676	704	5,262	3,186	8,448	693	5,194	3,124	8,318
29	Sanders Wash	10	40	80	120	10	40	80	120	10	40	80	120	10	40	80	120	10	40	80	120	10	40	80	120
30	China Camp	70	620	220	840	70	620	220	840	70	620	220	840	70	620	220	840	80	649	311	960	72	626	238	864
31	Croom	59	624	84	708	59	624	84	708	59	624	84	708	59	624	84	708	59	624	84	708	59	624	84	708
32	Rhyolite Peak	177	570	1,554	2,124	178	600	1,536	2,136	111	374	958	1,332	177	547	1,398	1,945	177	596	1,528	2,124	164	537	1,395	1,932
33	Sandia	12	116	28	144	12	116	28	144	12	116	28	144	12	116	28	144	12	116	28	144	12	116	28	144
34	Charlie Hill	48	358	218	576	48	358	218	576	48	358	218	576	46	358	218	576	48	358	218	576	48	358	218	576
35	Sand Wash	15	83	97	180	15	83	97	180	15	83	97	180	15	83	97	180	15	83	97	180	15	83	97	180
36	Carlisle	312	2,359	1,385	3,744	312	2,359	1,385	3,744	312	2,359	1,385	3,744	312	2,359	1,385	3,744	312	2,359	1,385	3,744	312	2,359	1,385	3,744

APPENDIX J (cont.)

GRAZING UNIT		1972				1973				1974				1975				1976				5-YEAR AVERAGE			
#	NAME	Total AUs	AUMs			Total AUs	AUMs			Total AUs	AUMs			Total AUs	AUMs			Total AUs	AUMs			Total AUs	AUMs		
			Public Lands	Other	Total		Public Lands	Other	Total		Public Lands	Other	Total		Public Lands	Other	Total		Public Lands	Other	Total		Public Lands	Other	Total
37	Woods Canyon	220	1,532	1,108	2,640	220	1,532	1,108	2,640	220	1,532	1,108	2,640	220	1,532	1,108	2,640	220	1,532	1,108	2,640	220	1,532	1,108	2,640
38	Horse	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12
39	Gale	10	24	96	120	10	25	95	120	10	24	96	120	10	24	96	120	10	24	96	120	10	24	96	120
40	Franklin	13	31	125	156	13	31	125	156	14	33	135	168	14	35	133	168	13	31	125	156	13	32	128	160
41	State Line	35	349	71	420	35	349	71	420	35	349	71	420	35	349	71	420	35	349	71	420	35	349	71	420
42	Pearson Mesa	24	144	144	288	24	144	144	288	24	144	144	288	24	144	144	288	24	144	144	288	24	144	144	288
43	Lazy "B"	2,204	16,305	13,037	29,342	2,179	15,832	7,620	23,452	1,763	14,176	6,980	21,156	2,385	15,425	7,595	23,020	2,029	16,314	8,034	24,348	2,112	15,610	8,653	24,263
44	Horseshoe	335	2,662	1,358	4,020	335	2,662	1,358	4,020	324	2,573	1,305	3,878	325	2,580	1,320	3,900	325	2,580	1,320	3,900	329	2,611	1,332	3,943
45	Little Doubtful	62	589	155	744	62	589	155	744	62	589	155	744	62	589	155	744	51	484	128	612	60	568	150	718
46	Creosote	150	1,459	341	1,800	150	1,459	341	1,800	150	1,459	341	1,800	150	1,459	341	1,800	112	1,089	255	1,344	142	1,385	323	1,708
47	Munson Cienega	0	0	0	0	0	0	0	0	52	66	84	150	0	0	0	0	0	0	0	0	10	13	17	30
48	Hackberry	525	6,300	0	6,300	525	6,300	0	6,300	335	3,326	0	3,326	525	6,300	0	6,300	260	3,120	0	3,120	434	5,069	0	5,069
49	Chimney	82	209	661	870	82	238	754	992	52	150	475	625	52	150	475	625	72	208	656	864	68	191	604	795
50	Ash Peak	150	1,219	248	1,467	152	1,276	258	1,534	163	1,210	246	1,456	156	1,181	241	1,422	106	1,056	216	1,272	145	1,188	242	1,430
51	Artesia	19	159	28	187	16	160	28	188	18	184	32	216	13	129	27	156	13	129	27	156	16	152	28	180
52	Stockton Pass	275	858	792	1,650	275	858	792	1,650	160	781	720	1,501	410	382	709	1,091	275	578	1,073	1,651	279	691	817	1,508
53	Tanque	80	864	96	960	100	966	107	1,073	100	1,368	152	1,520	210	1,674	60	1,734	250	2,106	144	2,250	148	1,396	112	1,508
54	Van Gausig	106	1,100	179	1,279	150	1,395	227	1,622	125	1,290	210	1,500	125	1,290	210	1,500	125	1,185	315	1,500	126	1,252	228	1,480
55	Badger Den	247	2,344	621	2,965	213	1,998	536	2,534	250	2,023	544	2,567	245	1,901	427	2,328	239	1,639	439	2,078	239	1,981	513	2,494
56	Poppy Canyon	98	344	842	1,186	98	344	842	1,186	98	342	837	1,179	98	342	837	1,179	98	342	837	1,179	98	343	839	1,182
57	Fisher	370	1,512	2,935	4,447	347	1,418	2,752	4,170	347	1,417	2,750	4,167	347	1,417	2,750	4,167	207	845	1,640	2,485	324	1,322	2,565	3,887
58	Fan	153	1,836	0	1,836	153	1,836	0	1,836	131	1,572	0	1,572	193	1,843	46	1,889	153	1,836	0	1,836	157	1,785	9	1,794
59	Joy Valley	710	6,476	2,045	8,521	710	6,476	2,045	8,521	435	3,968	1,253	5,221	417	3,803	1,200	5,003	417	3,803	1,200	5,003	538	4,905	1,549	6,454
60	Midway Canyon	64	509	261	770	64	509	261	770	60	476	245	721	64	508	261	769	74	587	302	889	65	518	266	784
61	Hilburn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	27	9	36	1	5	2	7
62	Murchison	289	2,590	136	2,726	289	2,474	130	2,604	487	3,527	185	3,712	414	2,988	157	3,145	289	2,473	130	2,603	353	2,810	147	2,957
63	Flying "W"	132	842	746	1,588	132	842	746	1,588	132	840	744	1,584	125	795	705	1,500	125	795	705	1,500	129	822	729	1,551
64	Polecat	32	384	0	384	32	384	0	384	32	384	0	384	32	384	0	384	32	384	0	384	32	384	0	384
65	Bowie	3	36	0	36	0	0	0	0	0	0	0	0	cancelled 6-18-75								1	7	0	7
66	Garret	135	552	1,071	1,623	135	633	990	1,623	115	470	912	1,382	135	551	1,069	1,620	289	356	512	868	161	512	910	1,422
67	Homestead	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12
68	San Simon	6	72	0	72	6	72	0	72	0	0	0	0	0	0	0	0	8	56	0	56	4	40	0	40
69	Roostercomb	202	1,448	965	2,413	202	1,455	970	2,425	192	1,383	922	2,305	187	1,347	898	2,245	187	1,347	898	2,245	194	1,396	930	2,326
70	Camels Back	8	96	0	96	8	96	0	96	8	96	0	96	8	96	0	96	8	96	0	96	8	96	0	96
71	Cedar Springs	62	293	458	751	62	293	458	751	62	291	455	746	62	291	455	746	62	291	455	746	62	291	455	746
72	Don Cabezas Community	173	1,434	644	2,078	170	1,407	633	2,040	170	1,407	633	2,040	170	1,407	633	2,040	170	1,407	633	2,040	171	1,412	635	2,047
73	Rough Mountain	170	1,286	755	2,041	170	1,286	755	2,041	137	1,036	608	1,644	170	1,286	755	2,041	170	1,286	755	2,041	163	1,236	725	1,961
74	Happy Camp	25	260	42	302	32	332	54	386	25	259	42	301	31	321	52	373	34	352	57	409	29	304	49	353
75	Silverstrike Community	250	1,365	1,358	2,723	228	1,118	1,060	2,178	197	1,304	1,061	2,365	226	1,458	1,131	2,589	215	1,517	1,062	2,579	223	1,352	1,134	2,486
76	Emigrant Canyon	3	36	0	36	3	36	0	36	3	36	0	36	3	36	0	36	3	36	0	36	3	36	0	36

APPENDIX J (cont.)

GRAZING UNIT		1972				1973				1974				1975				1976				5-YEAR AVERAGE			
#	NAME	Total	AUMs			Total	AUMs			Total	AUMs			Total	AUMs			Total	AUMs			Total	AUMs		
		AUs	Public Lands	Other	Total	AUs	Public Lands	Other	Total	AUs	Public Lands	Other	Total	AUs	Public Lands	Other	Total	AUs	Public Lands	Other	Total	AUs	Public Lands	Other	Total
77	Portal Road	2	24	0	24	2	14	0	14	2	24	0	24	2	24	0	24	2	24	0	24	2	22	0	22
78	Oil Well	13	156	0	156	13	156	0	156	13	156	0	156	10	112	0	112	0	0	0	0	10	116	0	116
79	Vanar	100	1,068	132	1,200	100	1,068	132	1,200	100	1,068	132	1,200	100	1,068	132	1,200	100	1,068	132	1,200	100	1,068	132	1,200
80	Ivanhoe	72	432	144	576	72	432	144	576	72	432	144	576	72	432	144	576	72	432	144	576	72	432	144	576
81	Siphon Canyon	42	252	252	504	27	156	169	325	27	156	169	325	27	156	169	325	27	156	169	325	30	175	185	360
82	Nine Mile	2	24	0	24	2	24	0	24	2	24	0	24	2	24	0	24	2	24	0	24	2	24	0	24
83	Apache Springs	190	969	171	1,140	200	1,020	180	1,200	175	298	52	350	200	1,020	180	1,200	175	998	52	1,050	188	861	127	988
84	Mulkins	20	120	0	120	20	120	0	120	20	120	0	120	20	120	0	120	20	120	0	120	20	120	0	120
85	Saltbush	9	108	0	108	9	108	0	108	9	108	0	108	27	39	43	82	12	45	50	95	13	81	18	99
86	El Paso	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	12	0	12	0	2	0	2
87	Realty	6	72	0	72	3	36	0	36	3	36	0	36	3	36	0	36	3	36	0	36	3	43	0	43
88	Whitetail	75	567	333	900	100	617	333	950	119	670	333	1,003	142	673	333	1,006	75	567	333	900	102	618	333	951
89	Clayton	26	188	47	235	26	188	47	235	26	188	47	235	26	188	47	235	26	185	49	234	26	188	47	235
90	Blue Mountain	242	873	1,274	2,147	234	843	1,285	2,128	238	860	1,296	2,156	246	881	1,310	2,191	248	881	1,310	2,191	241	867	1,295	2,162
91	Midway	50	96	204	300	25	64	164	228	25	84	216	300	65	128	329	457	27	84	123	207	38	91	207	298
92	Paradise	14	168	0	168	14	168	0	168	14	178	0	178	14	168	0	168	14	168	0	168	14	170	0	170
93	Contour	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	Cave Creek	8	96	0	96	4	48	0	48	4	48	0	48	cancelled 3-3-75								3	38	0	38
95	King	7	32	56	88	0	0	0	0	0	0	0	0	cancelled 2-1-75								1	6	11	17
96	Roberds	no grazing license has been issued on this allotment for over 10 years																				0	0	0	0
97	Rodeo	4	48	0	48	4	48	0	48	4	48	0	48	cancelled 3-3-75								2	28	0	28
98	Red Mountain	36	432	0	432	36	432	0	432	36	432	0	432	36	432	0	432	36	432	0	432	36	432	0	432
99	Small	2	24	0	24	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12	1	14	0	14
100	Lindsey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	Foote Wash	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	Cemetery	0	0	0	0	0	0	0	0	0	0	0	0	cancelled 6-6-75								0	0	0	0
103	Gripe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	Stockton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	Marijaldi	3	36	0	36	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12	1	17	0	17
106	Dankworth	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12
107	Gibson	1	1	11	12	1	1	11	12	1	1	11	12	1	1	11	12	1	1	11	12	1	1	11	12
108	Swift	1	1	11	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
109	Royce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	Artwell	2	24	0	24	2	24	0	24	0	24	0	24	2	24	0	24	2	24	0	24	2	24	0	24
111	Pioneer Mountain	9	129	0	129	9	129	0	129	9	129	0	129	9	133	0	133	9	129	0	129	9	130	0	130
112	Silver Creek	18	216	0	216	18	216	0	216	18	216	0	216	18	216	0	216	18	216	0	216	18	216	0	216
113	Pasadera Mountain	34	411	0	411	34	411	0	411	34	411	0	411	34	411	0	411	34	411	0	411	34	411	0	411
114	El Capitan	7	89	0	89	7	89	0	89	7	89	0	89	7	89	0	89	7	89	0	89	7	89	0	89
115	Ponderosa	5	54	0	54	5	54	0	54	5	54	0	54	5	54	0	54	5	54	0	54	5	54	0	54
116	Gilson Wash	7	83	0	83	7	83	0	83	7	83	0	83	7	83	0	83	7	83	0	83	7	83	0	83

APPENDIX J (cont.)

GRAZING UNIT		1972				1973				1974				1975				1976				5-YEAR AVERAGE			
#	NAME	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total
117	Dripping Springs	108	1,299	0	1,299	108	1,299	0	1,299	108	1,299	0	1,299	108	1,299	0	1,299	108	1,299	0	1,299	108	1,299	0	1,299
118	Limestone	58	700	0	700	58	700	0	700	58	700	0	700	58	700	0	700	58	700	0	700	58	700	0	700
119	Mescal Mountain	67	804	0	804	67	804	0	804	67	804	0	804	67	804	0	804	67	804	0	804	67	804	0	804
120	Hook and Line	81	973	0	973	81	973	0	973	81	973	0	973	81	973	0	973	81	973	0	973	81	973	0	973
121	Christmas	39	468	0	468	39	468	0	468	39	468	0	468	39	468	0	468	39	468	0	468	39	468	0	468
122	Hi-Y	2	25	0	25	2	25	0	25	2	25	0	25	2	25	0	25	2	25	0	25	2	25	0	25
123	Hidalgo	165	1,976	0	1,976	165	1,976	0	1,976	165	1,976	0	1,976	165	1,976	0	1,976	165	1,976	0	1,976	165	1,976	0	1,976
124	Piper Spring	16	189	0	189	16	189	0	189	16	189	0	189	16	189	0	189	16	189	0	189	16	189	0	189
125	Gypsum	3	39	0	39	3	39	0	39	3	39	0	39	3	39	0	39	3	39	0	39	3	39	0	39
126	Dudleyville	21	247	0	247	21	247	0	247	21	247	0	247	21	247	0	247	21	247	0	247	21	247	0	247
127	Malpais Hill	12	145	0	145	12	145	0	145	12	145	0	145	12	145	0	145	12	145	0	145	12	145	0	145
128	Painted Cave	41	495	0	495	41	495	0	495	41	495	0	495	41	495	0	495	41	495	0	495	41	495	0	495
129	Hell Hole	27	326	0	326	29	350	0	350	34	410	0	410	34	410	0	410	34	410	0	410	31	381	0	381
130	Aravaipa	609	2,202	2,766	4,968	514	2,098	2,628	4,726	604	2,019	2,978	4,997	604	2,019	2,978	4,997	604	2,019	2,978	4,997	587	2,071	2,866	4,937
131	Stanley Butte	9	108	0	108	9	108	0	108	9	108	0	108	9	108	0	108	9	108	0	108	9	108	0	108
132	Horse Mountain	20	240	0	240	20	240	0	240	20	240	0	240	20	240	0	240	20	240	0	240	20	240	0	240
133	Laurel Canyon	4	53	0	53	4	53	0	53	4	53	0	53	4	53	0	53	4	53	0	53	4	53	0	53
134	Klondyke	54	648	0	648	54	648	0	648	54	648	0	648	54	648	0	648	54	648	0	648	54	648	0	648
135	Squaw Creek	33	390	0	390	33	390	0	390	33	390	0	390	33	390	0	390	33	390	0	390	33	390	0	390
136	Turkey Creek	31	377	0	377	31	377	0	377	31	377	0	377	31	377	0	377	31	377	0	377	31	377	0	377
137	Panorama	12	144	0	144	12	144	0	144	12	144	0	144	12	144	0	144	12	144	0	144	12	144	0	144
138	Brandenburg Mountain	6	68	0	68	6	68	0	68	6	68	0	68	6	68	0	68	6	68	0	68	6	68	0	68
139	Holy Joe	13	150	0	150	13	150	0	150	13	150	0	150	13	150	0	150	13	150	0	150	13	150	0	150
140	Massare	15	180	0	180	15	180	0	180	15	180	0	180	15	180	0	180	15	180	0	180	15	180	0	180
141	Zapata	49	584	0	584	49	584	0	584	49	584	0	584	49	584	0	584	49	584	0	584	49	584	0	584
142	Dry Camp	9	108	0	108	9	108	0	108	9	108	0	108	9	108	0	108	9	108	0	108	9	108	0	108
143	Tiger	50	599	0	599	50	599	0	599	50	599	0	599	50	599	0	599	50	599	0	599	50	599	0	599
144	Reliable	7	80	0	80	7	80	0	80	7	80	0	80	7	80	0	80	7	80	0	80	7	80	0	80
145	Copper Creek	143	1,715	0	1,715	143	1,715	0	1,715	143	1,715	0	1,715	143	1,715	0	1,715	143	1,715	0	1,715	143	1,715	0	1,715
146	Schoenholzer Canyon	65	782	0	782	65	782	0	782	65	782	0	782	65	782	0	782	65	782	0	782	65	782	0	782
147	Hotwell	44	530	0	530	44	530	0	530	44	530	0	530	44	530	0	530	44	530	0	530	44	530	0	530
148	Y.L.E.	28	335	0	335	28	335	0	335	28	335	0	335	28	335	0	335	28	335	0	335	28	335	0	335
149	Kielberg	23	276	0	276	23	276	0	276	23	276	0	276	23	276	0	276	23	276	0	276	23	276	0	276
150	Crystal Cave	4	46	0	46	4	46	0	46	4	46	0	46	4	46	0	46	4	46	0	46	4	46	0	46
151	Diamond Bar	620	3,572	148	3,720	3,070	7,076	294	7,370	360	4,148	172	4,320	400	4,133	172	4,305	350	4,033	168	4,201	960	4,592	191	4,783
152	Tom Springs	85	422	13	435	71	828	25	853	135	1,032	31	1,063	111	1,196	36	1,232	102	1,187	36	1,223	101	933	28	961
153	Fort Thomas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
154	Dry Mine	350	3,990	10	4,000	400	4,560	240	4,800	400	4,332	228	4,560	400	4,048	213	4,261	400	4,048	213	4,261	390	4,195	181	4,376
155	North Eden Community	0	0	0	0	5	50	0	50	109	121	0	121	0	0	0	0	0	0	0	0	23	34	0	34
156	South Eden Community	20	80	0	80	18	54	0	54	0	0	0	0	0	0	0	0	0	0	0	0	8	27	0	27
157	Billingsly Creek	23	92	0	92	30	90	0	90	25	50	0	50	0	0	0	0	0	0	0	0	16	46	0	46

APPENDIX J (cont.)

GRAZING UNIT		1972				1973				1974				1975				1976				5-YEAR AVERAGE			
#	NAME	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total	Total AUs	AUMs Public Lands	AUMs Other	AUMs Total
158	Bryce	640	2,075	5,905	7,890	540	1,750	4,980	6,730	540	1,685	4,795	6,480	540	1,685	4,795	6,480	540	1,685	4,795	6,480	560	1,776	5,054	6,830
159	Kimball Community	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	Talley Wash	30	164	77	241	55	449	211	660	30	238	122	360	40	317	163	480	40	317	163	480	39	297	147	444
161	Skinner Community	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	Rest Haven	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
163	Lone Star	179	1,569	610	2,179	40	58	22	80	179	1,547	601	2,148	179	1,907	741	2,648	179	1,525	622	2,147	151	1,321	519	1,840
164	Sanchez	51	676	6	682	72	460	4	464	44	222	2	224	20	238	2	240	0	0	0	0	38	319	3	322
165	Johnny Creek	207	2,088	397	2,485	207	1,963	521	2,484	231	2,190	582	2,772	255	2,418	642	3,060	255	2,418	642	3,060	231	2,215	556	2,771
166	Bonita Creek	385	3,253	1,368	4,621	385	3,253	1,368	4,621	385	3,253	1,368	4,621	464	4,144	1,760	5,904	385	3,373	1,247	4,620	401	3,455	1,422	4,877
167	Bullgap Community	145	1,229	12	1,241	120	1,903	17	1,920	120	1,426	14	1,440	120	1,426	14	1,440	120	1,426	14	1,440	125	1,482	14	1,496
168	Turtle Mountain	280	2,757	605	3,362	280	2,756	604	3,360	280	2,756	604	3,360	280	2,756	604	3,360	280	2,756	604	3,360	280	2,756	604	3,360
169	Geronimo	25	35	15	50	100	138	62	200	0	0	0	0	0	0	0	0	35	49	22	71	32	44	20	64
170	Emery	60	184	0	184	60	325	0	325	50	50	0	50	0	0	0	0	60	90	0	90	46	130	0	130
171	Alkalai	40	456	24	480	40	456	24	480	40	456	24	480	40	456	24	480	40	456	24	480	40	456	24	480
172	Fine Wash	20	232	0	232	63	476	0	476	30	322	0	322	30	155	0	155	0	0	0	0	29	237	0	237
173	Bench Mark	0	0	0	0	35	119	0	119	10	25	0	25	10	16	0	16	0	0	0	0	11	32	0	32
174	North Fort Thomas Comm.	18	216	0	216	18	216	0	216	18	216	0	216	18	216	0	216	18	216	0	216	18	216	0	216
175	South Fort Thomas Comm.	0	0	0	0	100	200	0	200	100	100	0	100	0	0	0	0	0	0	0	0	40	60	0	60
176	Red Knolls	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	Goodwin Wash	4	36	12	48	4	36	12	48	0	0	0	0	0	0	0	0	0	0	0	0	2	14	5	19
178	White Spring	23	252	24	276	23	252	24	276	25	274	27	301	25	274	27	301	25	274	27	301	24	265	25	290
179	Cobre Grande	10	77	45	122	10	76	44	120	10	76	44	120	10	76	44	120	10	76	44	120	10	76	44	120
180	Black Rock	35	320	100	420	35	320	100	420	35	320	100	420	35	320	100	420	35	320	100	420	35	320	100	420
181	Spenazuma	43	387	129	516	13	117	39	156	13	114	42	156	13	114	42	156	13	114	42	156	19	169	59	228
182	Holdup Canyon	105	1,097	163	1,260	105	1,097	163	1,260	105	1,097	163	1,260	109	1,121	187	1,308	109	1,121	187	1,308	107	1,107	172	1,279
183	Jackson Mountain	96	646	506	1,152	96	646	506	1,152	96	646	506	1,152	96	646	506	1,152	96	646	506	1,152	96	646	506	1,152
184	White House	128	984	552	1,536	146	1,122	630	1,752	146	1,122	630	1,752	146	1,122	630	1,752	146	1,122	630	1,752	142	1,094	614	1,708
185	Oso Largo	171	379	0	379	171	602	0	602	131	652	0	652	101	300	0	300	46	95	0	95	124	406	0	406
186	Bear Spring	10	54	16	70	15	47	13	60	0	0	0	0	6	3	0	3	0	0	0	0	6	21	6	27
187	Pima	75	115	37	152	75	169	56	225	75	169	56	225	0	0	0	0	0	0	0	0	45	91	30	121
188	Mesa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
189	Mud Hollow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	Spear Community	92	752	62	814	152	939	35	974	102	779	35	814	102	779	35	814	102	779	35	814	102	805	40	845
191	Mud Springs Community	50	185	233	418	50	185	233	418	50	185	233	418	50	185	233	418	50	185	233	418	50	185	233	418
192	Lefthand Canyon	3	36	0	36	3	36	0	36	3	36	0	36	3	36	0	36	3	36	0	36	3	36	0	36
193	Mixed-Up	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12	1	12	0	12
TOTALS		18,436	136,858	68,918	205,776	20,985	141,578	62,008	203,586	17,382	130,335	60,622	190,957	18,509	135,568	62,547	198,115	17,162	130,011	61,429	191,440	18,467	134,855	63,090	197,945

Source: Licenses and Leases in the District Case Files

GLOSSARY

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GLOSSARY

Abbreviations

The following abbreviations are used frequently in this statement. Those representing terms will be defined under respective entries in the glossary.

AG&FD	Arizona Game & Fish Department
AMP	Allotment Management Plan
AU	animal unit
AUM	animal unit month
BLM	Bureau of Land Management
CCD	Census County Division
CFR	Code of Federal Regulations
CYL	cattle yearlong
EAR	Environmental Assessment Report
ES	Environmental Statement
FLPMA	Federal Land Policy and Management Act of 1976
MFP	Management Framework Plan
ORV	off-road vehicle
SCS	Soil Conservation Service
SSF	soil surface factor
URA	Unit Resource Analysis
VRM	visual resource management

Terms

Adjudication: the legal processing of applications, entries, and claims to assure full compliance with the public land laws and regulations.

Aesthetics: dealing with the nature of the beautiful and with judgments concerning beauty.

Alkali soil: a soil that contains sufficient alkali (sodium) to interfere with the growth of plants.

Allotment: an area of land where one or more operators graze their livestock. It generally consists of public lands but may include parcels of private or State owned lands. The number of livestock and season of use are stipulated for each allotment. An allotment may consist of one or several pastures. (Compare with grazing unit.)

Allotment Management Plan (AMP): a livestock grazing management plan dealing with a specific unit of rangeland, based on multiple-use resource management objectives. The AMP considers livestock grazing in relation to other uses of the range and in relation to the renewable resources--watershed, vegetation, and wildlife. An AMP establishes the seasons of use, the number of livestock to be permitted on the range, and the range improvements needed.

Alluvial fan: a sloping, fan-shaped mass of sediment deposited by a stream where it emerges from an upland onto a plain.

Alluvial soil: soil formed in recently deposited alluvium, exhibiting essentially no horizon development or modification from the parent material.

*Animal unit (AU): considered to be one mature (1,000 lb.) cow or the equivalent based upon average daily forage consumption of 26 pounds dry matter per day (Range Term Glossary Committee, 1974).

Animal Unit Month (AUM): the amount of forage necessary for the sustenance of one cow or its equivalent for a period of 1 month.

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*Reproduced from A Glossary of Terms Used in Range Management with permission of the Society for Range Management.

**Reproduced from Resource Conservation Glossary with permission of the Soil Conservation Society of America.

*Annual plant: a plant that completes its life cycle and dies in one year or less (Range Term Glossary Committee, 1974).

Aquifer: a water-bearing bed or stratus of permeable rock, sand, or gravel capable of yielding considerable quantities of water.

Archaeological resources: all physical evidence of past human activity other than historical documents, which can be used to reconstruct lifeways and cultural history of past peoples. These resources include sites, artifacts, environmental data, and all other relevant information.

Artifact: any object made, modified, or used by man.

Available water capacity: the capacity of a soil to store water available for use by plants, usually expressed in linear depths of water per unit depth of soil. In this ES, four classes are used and defined as follows:

	Inches per foot
high	> 1.5
moderate	1.0 - 1.5
low	.5 - 1.0
very low	< .5

Avifauna: the birds or kinds of birds of a given region.

Basal area: the area of ground surface covered by the stem or stems of a range plant, usually measured 1 inch above the soil in contrast to the full spread of foliage.

Basic elements: the four major elements (form, line, color, and texture) that determine how the character of a landscape is perceived.

*Biomass: the sum total of living plants and animals above and below ground in an area at a given time (Range Term Glossary Committee, 1974).

**Biome: a major biotic unit consisting of plant and animal communities having similarities in form and environmental conditions (Soil Conservation Society of America, 1970).

Browse: the tender shoots, twigs, and leaves of trees and shrubs often used as food by cattle, deer, elk, and other animals; to feed or eat on browse.

**Bulk density: the mass of dry soil per unit bulk volume. A unit of measure, usually expressed as grams per cubic centimeter or pounds per square foot (Soil Conservation Society of America, 1970).

Buteo: any of a genus (Buteo) of hawks having broad rounded wings and soaring flight.

Calcareous soil: soil containing sufficient calcium carbonate (often with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

*Calf crop: the number of calves weaned from a given number of cows bred, usually expressed in percent (Range Term Glossary Committee, 1974).

Canopy: the vertical projection downward of the aerial portion of shrubs and trees, usually expressed as percent of ground so occupied.

*Carrying capacity (grazing capacity): the maximum stocking rate possible without inducing damage to vegetation or related resources. It may vary from year to year in the same area because of fluctuating forage production (Range Term Glossary Committee, 1974).

Carry-over forage: ungrazed forage produced during the previous year.

Cattle yearlong (CYL): the amount of forage necessary to sustain one cow for a 1-year period. One CYL equals 12 AUMs.

Census County Division (CCD): county division used by the U.S. Bureau of the Census for enumerating some census data.

Characteristic: a distinguishing trait, feature, or quality.

Characteristic landscape: the established landscape within an area being viewed, not necessarily naturalistic but also referring to a farming or urban landscape.

Cienega: swamp or marsh, especially one formed by hillside springs.

Climax: the highest ecological development of a plant community capable of perpetuation under the prevailing climate and soil conditions.

Cobble: rock fragments, generally rounded, between 3 and 10 inches in diameter.

Contrast: the effect of a striking difference in the form, line, color, or texture of an area being viewed.

Cool-season plant: a plant whose major growth period occurs during the winter and early spring. See warm-season plant.

Cull cow weight: weight of a cow when removed from a livestock operation.

Cultural resources: those fragile and nonrenewable remains of human activities, occupations, and endeavors as reflected in sites, buildings, structures, or objects, including works of art, architecture, and engineering. Cultural resources are commonly discussed as prehistoric and historic values, but each period represents a part of the full continuum of cultural values from the earliest to the most recent.

Depth, effective soil: the depth of soil material that plant roots can penetrate readily to obtain water and plant nutrients. Four classes are used in this ES: deep--more than 40 inches deep; moderately deep--20 to 40 inches; shallow--10 to 20 inches; very shallow--less than 10 inches deep.

Diatomaceous: consisting of diatoms (microscopic aquatic plants) or the siliceous remains of diatoms, which accumulate in great abundance in underwater deposits.

Disclimax: a relatively stable ecological community that has displaced the climax community because of disturbance, especially by man. A disclimax community often includes organisms foreign to the region.

Doctrine of prior appropriation: water doctrine adopted by Arizona, giving the first user of water from a stream the first right to such water. If the first user does not consume all of the water, then the second and subsequent users can appropriate water for their needs.

Dominant elements: those basic elements in a particular landscape that exert the greatest influence on the visual character of the landscape.

Drainage, natural: a soil condition referring to the frequency and duration of periods when the soil is free of saturation or partial saturation. Two drainage classes are recognized in this ES: Well-drained--water is removed from the soil readily but not rapidly. These soils are normally medium textured, but finer or coarser-textured soils may fall in this class. Moderately well-drained--water is removed from the soil slowly, so that the profile is wet for a small but significant part of the time. These soils commonly have a slowly permeable layer within or immediately underneath the solum.

Economic unit: a business organization large enough to take advantage of certain economies of scale that permit it to realize a normal rate of return on investments.

Ecosystem: complex selfsustaining natural system that includes living and nonliving components of the environment and the interactions that bind them together. Its functioning involves the circulation of matter and energy between organisms and their environment.

**Ecotone: a transition line or strip of vegetation between two communities, having characteristics of both kinds of neighboring vegetation as well as characteristics of its own (Soil Conservation Society of America, 1970).

Endangered species: any species in danger of extinction throughout all or a significant portion of its range. This definition excludes species of insects that the Secretary of the Interior determines to be pests and whose protection under the Endangered Species Act of 1973 would present an overwhelming and overriding risk to man. See threatened species.

Environment: the surrounding conditions, influences, or forces that affect or modify an organism or an ecological community and utlimately determine its form and survival.

Environmental Assessment Record (EAR): the procedure and format for recording environmental analysis (the systematic process of considering environmental factors in land management actions).

Erosion: the wearing away of the land surface by wind, water, and other geological agents.

Erosion pavement: a layer of coarse fragments of gravel and stones on the surface of the ground, remaining after the removal of fine soil particles by erosion.

Estivate: to pass the summer in a state of dormancy.

Evapotranspiration: the loss of water by transpiration from plants and evaporation from the soil.

Flooding hazard: the susceptibility of a soil, generally due to its position of occurrence, to overflow or inundation, usually damaging, from streams or other flood channels.

Flood plain: nearly level land situated on either side of a channel that is subject to overflow flooding.

**Food chain: a series of plant or animal species in a community, each of which is related to the next as a source of food (Soil Conservation Society of America, 1970).

**Forb: a herbaceous plant that is not a grass, sedge, or rush (Soil Conservation Society of America, 1970).

Grazing capacity: see carrying capacity.

Grazing unit: as used in this document, a parcel or parcels of land managed as a unit. A grazing unit may include one or more allotments, but parcels and allotments within most units are contiguous and held by a single licensee.

*Growth form: the characteristic shape or appearance of an organism (Range Term Glossary Committee, 1974).

*Half-shrub: a perennial plant with a woody base whose annually produced stems die each year (Range Term Glossary Committee, 1974).

Herbaceous: pertaining to plants having little or no woody tissue.

Herbage: herbaceous vegetation (as grass) especially when used for grazing.

Hard pan: a hardened or cemented soil layer. The soil material may be sandy or clayey and may be cemented by silica or calcium carbonate.

Herptofauna: the reptiles and amphibians of a region.

Home range: a relatively small area containing all of the habitat requirements (food, shelter, water, and escape cover) needed by animals.

Hunter day: participation of one person in hunting for all or part of one day.

Hunter success ratio: the percentage of hunters that successfully harvest big-game species.

Hydrologic group: a grouping of soils for estimating the runoff potential on watersheds. The classification indicates the minimum rate of infiltration obtained from a bare soil at the end of the individual storms occurring after the soil has had prolonged wetting and opportunity for swelling. Four groups are used:

Group A:--soils having high infiltration rates even when thoroughly wetted, consisting chiefly of deep, well to excessively drained sands or gravel or both. These soils have a high rate of water transmission and have a low runoff potential.

Group B--soils having moderate infiltration rates when thoroughly wetted, consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

Group C--soils having slow infiltration rates when thoroughly wetted, consisting chiefly of (1) soils with a layer that impedes the downward movement of water, or (2) soils with moderately fine to fine texture and a slow infiltration rate. These soils have a slow rate of water transmission.

Group D--soils having very slow infiltration rates when thoroughly wetted, consisting chiefly of (1) clay soils with a high swelling potential, (2) soils with a high permanent water table, (3) soils with a clay pan or clay layer at or near the surface, and (4) shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.

Influent species: an animal species that changes the balance of an ecological community.

Intensive livestock grazing management: a livestock management program based on the multiple-use resource management concept, providing for the orderly use of rangeland resources for livestock production along with other uses such as wildlife habitat and outdoor recreation.

Intrusion: a feature (land, vegetation, or structure) that is generally considered out of context with the characteristic landscape.

*Key area: A portion of range, which, because of its location, grazing or browsing value, and/or use, serves as an indicative sample of range conditions, trend or degree of use seasonally (Range Term Glossary Committee, 1974).

*Key species: forage species whose use serves as an indicator to the degree of use of associated species (Range Term Glossary Committee, 1974).

Lacustrine: pertaining to, living, growing, or formed in, or belonging to lakes.

Landscape modifying activities: any action that changes the vegetation or landforms or places structures on the landscape.

Lime (limy): chemical lime is calcium oxide, but as the term is commonly used, it is also calcium carbonate hydroxide. When present in visible amounts, lime is also sometimes locally called "caliche."

Lithic: stone; man-made stone tool.

Lithic scatter: a type of cultural site comprised of human-made stone tools and/or tool-production waste materials of stone scattered over the surface of the ground.

**Litter: a surface layer of loose organic debris consisting of freshly fallen or slightly decomposed organic materials (Soil Conservation Society of America, 1970).

Loam: see texture, soil.

Madrean: referring to plants native to the Sierra Madre of Mexico; an evergreen oak-juniper woodland.

Management Framework Plan (MFP): land use plan for public lands that provides a set of goals, objectives, and constraints for a specific planning area to guide the development of detailed plans for the management of each resource.

Mano: a hand-held stone used to grind or crush grain or other material placed on a metate.

Mapping unit: a kind of soil, a combination of kinds of soils, or land types that can be shown at the scale of mapping for the defined purposes and objectives of a survey. Mapping units are generally designed to reflect significant differences in use and management.

Metate: a stationary stone used as a container-anvil for the grinding of grain or other material with a mano.

Micromhos: a measurement of electrical conductance that gives an approximation of the total amount of soluable salt in a medium.

Mineralized area: a land unit that is capable of beneficial use and development for mineral production within a reasonable future period.

Mortar: a deep, cup-shaped container or anvil of stone used to hold grain or other material being crushed or ground by a hand-held pestle.

Multiplier: a number that, when multiplied by $1.00, indicates the total change in personal income resulting from a one dollar change in income to a particular sector. With a multiplier of 1.226, one dollar in livestock income would create $1.226 as the first dollar is exchanged secondarily.

National resource lands (NRL): former name for public lands administered by the Bureau of Land Management.

Natural area: lands having typical or unusual plant or animal types, associations, or other biotic phenomena; or outstanding scenic, geologic, pedologic, or aquatic features or processes.

Natural environment area: various types of areas that are suitable for recreation in a natural environment and usually in combin ation with other uses.

Naturalistic landscape: a situation where the basic elements (form, line, color, and texture) are displayed in a composition that appears natural within the surrounding area or character type.

**Niche: the place in the plant or animal community that a species may occupy (Soil Conservation Society of America, 1970).

Off-road vehicle (ORV): any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain, excluding (a) any registered motorboat, (b) any fire, military, emergency, or law enforcement vehicle when used for emergencies, and any combat support vehicle when used for national defence, and (c) any vehicle whose use is expressly authorized by the respective agency head under a permit, lease, license, or contract.

Obligate species: species for which a specific habitat is absolutely necessary for survival.

Paleoecology: the study of the relationship between ancient organisms and their environment.

Paleoenvironment: the environment of an area at some specified time in the past.

Participation days: participation by an individual in a specific recreation activity one or more times during a single day.

*Pasture: a grazing area enclosed and separated from other areas by fence (Range Term Glossary Committee, 1974).

Pediment: broad, gently sloping bedrock surface with low relief, located at the base of a steeper slope and often veneered with alluvial gravel and sand.

Pedologic: of or relating to soil science.

*Perennial plant: a plant that has life cycle of 3 or more years (Range Term Glossary Committee, 1974).

Permanent free water: water that is present and available to wildlife yearlong.

Permeability, soil: the quality of a soil layer that enables water or air to move through it. The permeability of a soil may be limited by the presence of one nearly impermeable layer even though others are permeable. The following terms describe permeability:

very slow	.06 inches per hour
slow	0.06- 0.20 inches per hour
moderately slow	0.20- 0.60 inches per hour
moderate	0.60- 2.00 inches per hour
moderately rapid	2.00- 6.00 inches per hour
rapid	6.00-20.00 inches per hour
very rapid	20.00 inches per hour

Perpetual succession: ecological succession that, because of repetitive disturbance, continues to repeat itself rather than reach climax. Perpetual succession might occur in riparian communities where succession is periodically disturbed by flooding.

Petroglyph: an art figure or symbol cut, carved, or pecked into a stone surface.

Phenology: the study of periodic biological phenomena such as start of growth, flowering, seeding, and dormancy, especially in relation to climate.

Pictograph: an art figure or symbol drawn or painted on a stone surface.

Planning Unit: a geographic unit within a Bureau of Land Management district that includes related lands, resources, and use-pressure problems, which are considered together for resource inventory and planning.

Poverty level: the U.S. Bureau of the Census' threshold income for poverty, determined by such factors as family size, sex of family head, number of children under 18 years old, and farm and nonfarm residence.

Preference lands: the privately owned or controlled land upon which the issuance of a grazing lease is based.

*Primary production: the conversion of solar energy to chemical energy through the process of photosynthesis. It is represented by the total quantity of organic material produced within a given period by vegetation (Range Term Glossary Committee, 1974).

Primitive area: natural, wild, and undeveloped areas, essentially removed from the effects of civilization.

Profile, soil: a vertical section of the soil from the surface through all its layers, including the parent material. Unless otherwise stated in this statement, soil profile refers to the section from the surface to 60 inches or bedrock.

Proper stocking: the number of animals grazed on a given area that will result in proper use at the end of the planned grazing period.

Public lands: formal name for lands administered by the Bureau of Land Management.

Pure competition: economic situation in which the production of any one firm is so small when compared to the total production of an industry that the firm's actions do not influence market prices.

Range condition: the present state of vegetation of a range site in relation to the climax (natural potential) plant community for the site.

Range improvement: a structure, development, or treatment used in concert with management to rehabilitate, protect, and improve public land and its resources: to arrest range deterioration; and to improve forage condition, fish and wildlife habitat, watershed protection, and livestock production, all consistent with land use plans.

Range site: a distinctive kind of rangeland that differs from other kinds in its ability to produce a characteristic natural plant community.

Range trend: change in vegetation and soil characteristics resulting directly from environmental factors, primarily climate and grazing.

Raptor: a bird of prey.

Records search inventory: as used in this ES, an inventory of cultural resources through a search of all known existing records.

Recreation and Public Purpose Act (R&PP): the Federal Act of June 14, 1926 as amended (43 USC 869 et. seq.) providing the legal authority for BLM to sell or lease lands to local and State governments or nonprofit organizations for recreation and public purposes.

Residual impact: the adverse impact of an action that would occur after all mitigating measures have been taken.

Riparian: situated on or pertaining to the bank of a river, stream, or other body of water. Normally used to refer to plants of all types that grow along streams or around springs.

Riparian water rights: English common law doctrine giving the owner of land through which a stream flows certain rights to the water of the stream.

**Runoff (hydraulics): that portion of the precipitation on a drainage area that is discharged from the area in stream channels. Types include surface runoff, groundwater runoff, or seepage. (Soil Conservation Society of America, 1970).

*Sacrifice area: a portion of the range, irrespective of site, that is intentionally overgrazed to obtain sufficient overall use of the management area (Range Term Glossary Committee, 1974).

Salvage (archaeological): emergency recovery of cultural or paleontological data to prevent their loss from human or natural disturbance. Recovery techniques usually include partial or complete excavation.

Scenic quality: the quality of the scenery as determined through the use of the scenic evaluation process.

Secondary succession: the orderly process by which plant communities develop toward the climax plant association after disturbance.

Section 15 lands: public lands provided for under Section 15 of the Taylor Grazing Act of 1934, that are too scattered and intermingled with greater areas of State and private land to justify their inclusion in any grazing district.

Section 3 lands: public lands administered by the Bureau of Land Management, provided for under Section 3 of the Taylor Grazing Act of 1934, and included within grazing districts.

Sediment loss: solid material (sediment) transported out of a watershed by wind or water.

Sediment yield: the volume of soil moved from its point of origin to another point on the Earth's surface by wind or water.

Sensitivity level(s): an index of the relative importance or value of visual response to an area in relation to other areas in the planning unit.

Seral community: relatively transitory biotic community constituting a stage of ecological succession.

Sherd: a fragment of a pottery vessel.

Site (archaeological): a physical location where human activities or events occurred.

Slope classes: grouping of slope gradients into named classes as follows:

nearly level	0 to 2 percent
gently sloping	2 to 5 percent
moderately sloping	5 to 8 percent
strongly sloping	15 to 30 percent
steep	30 to 60 percent
very steep	more than 60 percent

Soil surface factor (SSF): a numerical expression of surface erosion caused by wind and water as reflected by soil movement, surface litter, erosion pavement, pedestalling, rills, flow patterns, and gullies. Values vary from 0 for no erosion condition to 100 for a severe condition.

Stabilization (archaeological): protective techniques applied to structures and ruins to maintain their existing condition and prevent further deterioration, for example, capping mud-mortared masonry with soil cement.

*Stocking rate: the area of land that the operator has allowed to each animal unit for the entire grazeable period of the year. May be expressed as a ratio such as AU/section; acres/AU or acres/AUM (Range Term Glossary Committee, 1974).

Stones: rock fragments larger than 10 inches in diameter.

Surface soil or layer: the uppermost layer of the soil ordinarily moved in tillage or its equivalent in uncultivated soil, about 3 to 8 inches thick.

Talus: the slope formed by the accumulation of rock debris at the base of a cliff.

Terrace: a nearly level or undulating plain bordering a river or lake, commonly rather narrow and usually with a steep front.

Texture, soil: the relative proportions of sand, silt, and clay particles in a mass of soil. The different texture classes are commonly referred to in general terms as listed below:

sands loamy sands	coarse-textured soils	
sandy loam fine sandy loam	moderately coarse-textured soils	sandy soils
very fine sandy loam loam silt loam silt	medium textured soils	loamy soils
sandy clay silty clay clay	fine textured soils	clayey soils

Threatened species: any species likely to become endangered within the foreseeable future throughout all or a significant part of its range.

Unallotted grazing units (allotments): grazing units on whose public lands no grazing privileges are allotted.

Unit Resource Analysis (URA): the system of data gathering and analysis that precedes the land use planning for public lands.

Utilization, forage: the proportion of current year's forage production that is eaten or destroyed by grazing animals, usually expressed as a percentage.

Vegetation trend: see range trend.

*Vegetation type: a plant community with distinguishable characteristics (Range Term Glossary Committee, 1974).

Visitor day: 12 visitor hours, which may be aggregated continuously, intermittently, or simultaneously by one or more people.

Visual management unit: an area of land where the visual, sensitivity, and scenic quality zones do not vary.

Visual resource: the land, water, vegetation, animal, and other features visible on the landscape.

Visual resource management (VRM) classes: classification of landscapes according to the kinds of structures and modifications that are acceptable to meet established visual goals.

Visual zones: the area that can be seen as foreground, middleground, background, or seldom seen.

Warm-season plant: a plant whose growth period or major portion thereof occurs in spring, summer, and fall. Such plants are usually dormant in the winter. See cool-season plant.

Water base: the presence of water suitable for livestock consumption and available, accessible, and adequate for a certain number of livestock while they are on the range--a basis for the issuance of a grazing lease.

Watershed yield: flow of ground and surface water out of a watershed.

Xeric: relating to, characterized by, or requiring only a small amount of moisture.

Zeolites: crystalline hydrated aluminosilicates of the alkali and alkaline earth elements, which have diverse industrial uses in purification and drying of liquids and gasses, chemical separation, catalysis, and decontamination of radioactive wastes.

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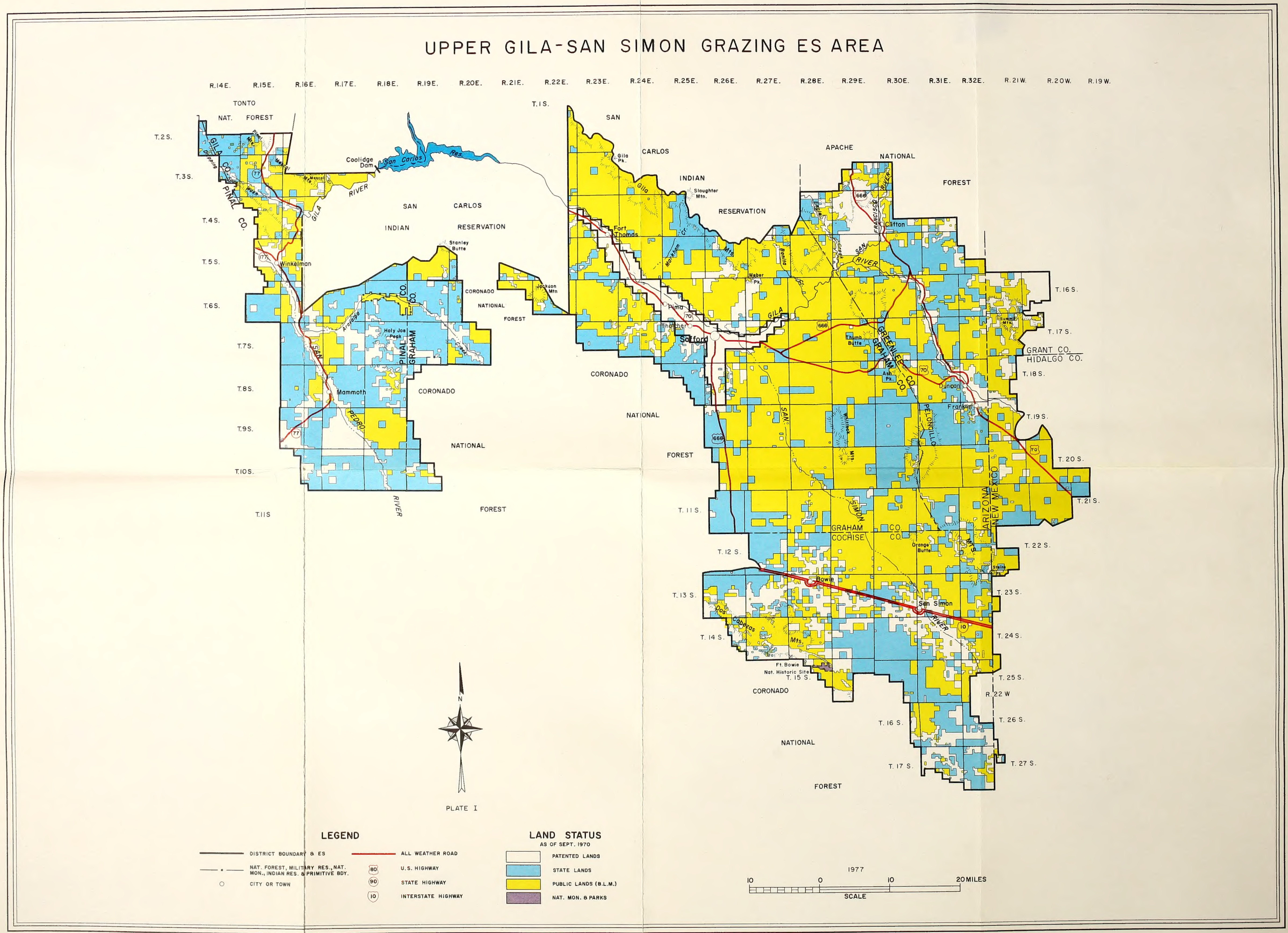
UPPER GILA-SAN SIMON GRAZING ES AREA
R.14E. R.15E. R.16E. R.17E. R.18E. R.19E. R.20E. R.21E. R.22E. R.23E. R.24E. R.25E. R.26E. R.27E. R.28E. R.29E. R.30E. R.31E. R.32E. R.21W. R.20W. R.19W.
T.1S. T.2S. T.3S. T.4S. T.5S. T.6S. T.7S. T.8S. T.9S. T.10S. T.11S
T.11 S. T.12 S. T.13 S. T.14 S. T.15 S. T.16 S. T.17 S.
T.16 S. T.17 S. T.18 S. T.19 S. T.20 S. T.21 S. T.22 S. T.23 S. T.24 S. T.25 S. T.26 S. T.27 S.
R.22 W
TONTO NAT. FOREST
GILA CO.
PINAL CO.
Coolidge Dam
San Carlos Res.
GILA RIVER
SAN CARLOS INDIAN RESERVATION
Stanley Butte
Winkelman
Mammoth
SAN PEDRO RIVER
Aravaipa Creek
Holy Joe Peak
PINAL CO.
GRAHAM CO.
CORONADO NATIONAL FOREST
Jackson Mtn
Gila Pk.
Slaughter Mtn.
Fort Thomas
Pima
Thatcher
Safford
Weber Pk.
APACHE NATIONAL FOREST
Clifton
SAN FRANCISCO RIVER
Thumb Butte
Ash Pk.
GREENLEE CO.
GRAHAM CO.
Duncan
Franklin
PELONCILLO MTS.
GRANT CO.
HIDALGO CO.
ARIZONA
NEW MEXICO
SAN SIMON RIVER
GRAHAM CO.
COCHISE CO.
Orange Butte
Bowie
San Simon
Dos Cabezas Mts.
Ft. Bowie Nat. Historic Site
N
PLATE I
LEGEND
DISTRICT BOUNDARY & ES
NAT. FOREST, MILITARY RES., NAT. MON., INDIAN RES. & PRIMITIVE BDY.
CITY OR TOWN
ALL WEATHER ROAD
U.S. HIGHWAY
STATE HIGHWAY
INTERSTATE HIGHWAY
LAND STATUS
AS OF SEPT. 1970
PATENTED LANDS
STATE LANDS
PUBLIC LANDS (B.L.M.)
NAT. MON. & PARKS
1977
10 0 10 20 MILES
SCALE

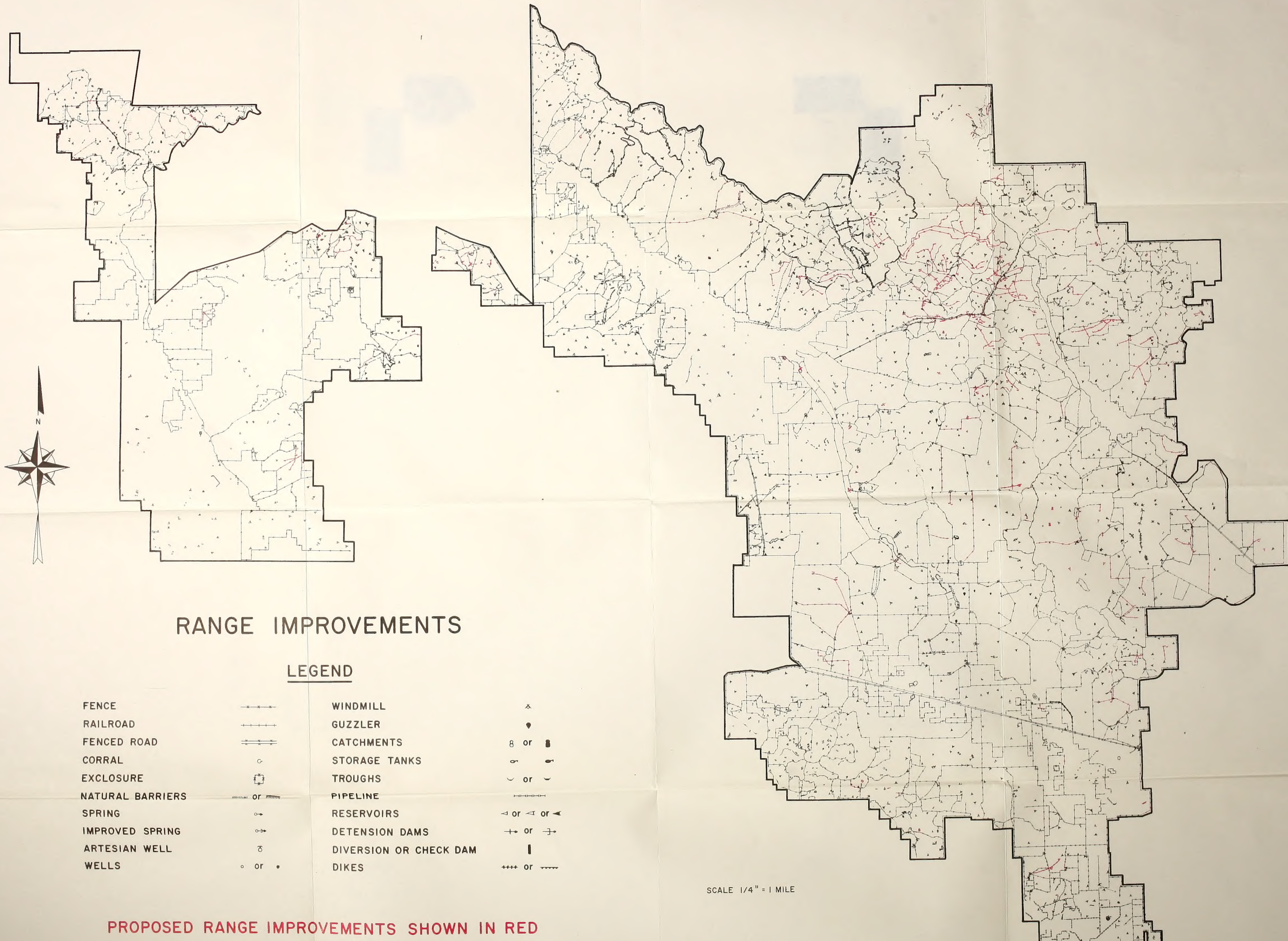
RANGE IMPROVEMENTS
LEGEND
FENCE
RAILROAD
FENCED ROAD
CORRAL
EXCLOSURE
NATURAL BARRIERS or
SPRING
IMPROVED SPRING
ARTESIAN WELL
WELLS or
WINDMILL
GUZZLER
CATCHMENTS or
STORAGE TANKS
TROUGHS or
PIPELINE
RESERVOIRS or or
DETENSION DAMS or
DIVERSION OR CHECK DAM
DIKES or
N
SCALE 1/4" = 1 MILE
PROPOSED RANGE IMPROVEMENTS SHOWN IN RED

PLATE 2