



# Coconino National Forest

## Red Rock Ranger District

### Environmental Assessment

#### Buckhorn Allotment

#### Rangeland Management Analysis

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Robert Garcia/USFS

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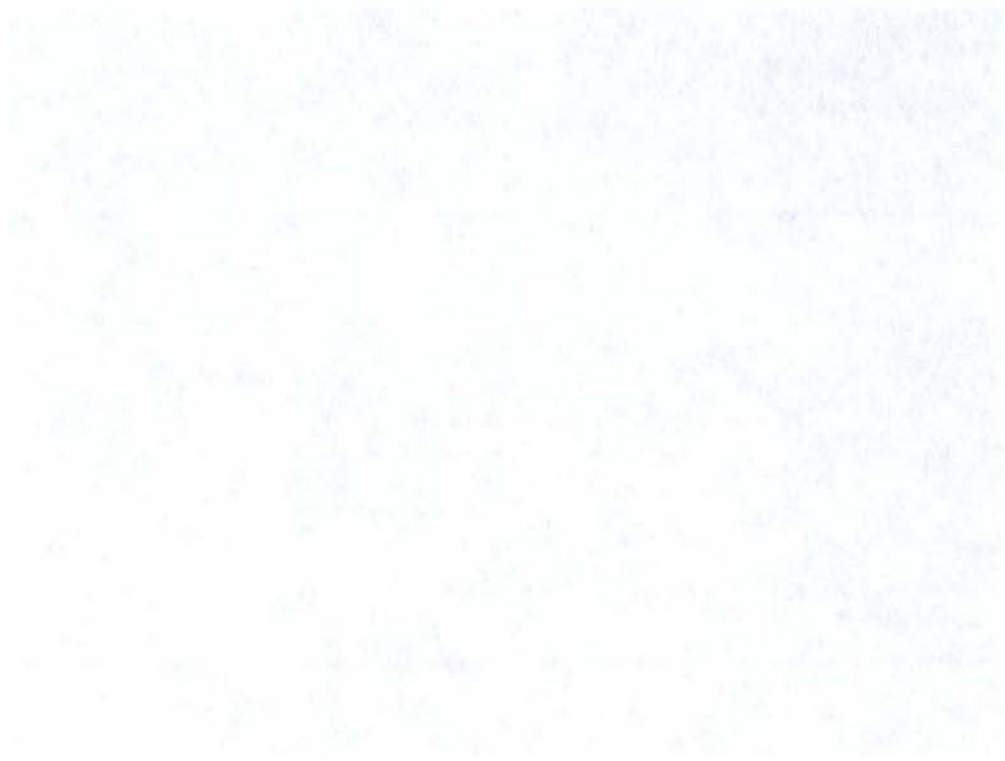
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**September 2010**



Coconut Hill  
Red Hook, N.Y.

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Heather C. Provencio, District Ranger, Red Rock Ranger District

**Project Location:** Buckhorn Allotment, Coconino National Forest, Arizona.  
See Appendix 1, Map 1

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**Abstract:**

This Environmental Assessment documents the anticipated environmental consequences of alternatives to address livestock grazing on the Buckhorn Allotment of the Coconino National Forest. The analysis area consists of approximately 42,000 acres and includes 20 pastures. Livestock grazing is currently authorized on this allotment.

Internal and external scoping has revealed the following key issues related to livestock grazing:

- Rangeland Health and the Condition of Upland Vegetation
- Condition of Soils
- Economic, Social and Cultural Uses
- Effects to Merriam's Turkey

These key issues led to the development of the proposed action. The EA analyzes a no action or no grazing alternative (Alternative 1) and the proposed action (Alternative 2). The proposed action was developed collaboratively between the Forest Service and the Permittee. The proposed action would allow grazing to continue on Buckhorn Allotment, and incorporate the principles of adaptive management. Adaptive management would allow the Forest Service flexibility in addressing land health concerns, to quickly and more effectively respond to problem areas identified through monitoring. For example, adjustments could be made in seasons of use, numbers of cattle, and in the location of water developments and fences.

The proposed action would also help distribute livestock better over the allotment through the construction of fences and water developments.

If the Responsible Official makes the decision to continue livestock grazing on this allotment, she would be responsible for selecting either the proposed action as it presented in the EA, or making modifications to the proposed action, as long as the modifications are adequately covered through this analysis.

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# **Environmental Assessment**

## **Buckhorn Allotment Rangeland Management Analysis**

### **1.0 Introduction**

The Red Rock Ranger District (RRRD) and Mogollon Rim Ranger District of the Coconino National Forest propose to continue to authorize livestock grazing on Buckhorn Allotment in a manner that maintains resource conditions where allotment conditions are satisfactory, or moves resource conditions towards meeting Forest Plan objectives and desired on-the-ground conditions, where allotment condition is unsatisfactory.

For this analysis, when RRRD is used, it means both the Red Rock Ranger District and the portion of the Mogollon Rim Ranger District that is included in this project. RRRD is used as the inclusive term because the Red Rock District Ranger is the Responsible Official for this project, including that portion of the Mogollon Rim Ranger District that is affected.

### **1.1 Document Structure**

This Environmental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act to describe the environmental effects for the proposed action and the no action alternative for the Buckhorn Rangeland Management Analysis. This EA consists of four major sections and an appendix:

- *Introduction:* Includes information on the history and location of the allotment, the purpose and need for the project, and the agency's proposal for meeting that purpose and need.
- *Comparison of Alternatives, including the Proposed Action:* Provides a more detailed description of the Proposed Action as well as the No Action Alternative. This section also describes possible design criteria and possible range improvements.
- *Affected Environment and Environmental Consequences:* Describes the current conditions in the proposed project area and the environmental effects of implementing the Proposed Action and the No Action Alternative. This section includes a discussion of potential cumulative impacts to each affected resource.
- *Preparers:* Provides a list of those involved in the development of the EA.
- *Appendix:* Contains supporting information referenced in this document. This section also contains a glossary, which defines many of the scientific and technical terms used in this document.

Additional supporting documentation (maps, supporting data, resource specialist reports, etc.) is on file in a project record at the Red Rock Ranger District in Sedona, Arizona. Information referenced in specialist reports is available at the Ranger District offices. For example, high country data is kept at the Mogollon Rim Ranger District in Happy Jack, AZ.

This EA is not a decision document; it discloses the reasonably foreseeable environmental consequences of implementing the no action alternative and the proposed action. This EA does not speculate about every possible effect that could happen under various scenarios from the



implementation of an alternative; it focuses on those effects that we think, with a reasonable degree of certainty, would happen.

A separate decision, signed by the Responsible Official, would determine the course of action to be taken for Buckhorn Allotment. That decision may be one of the alternatives presented in this EA, or a modification of an alternative.

Upon completion of the decision document, if grazing is to continue, a new Term Grazing Permit (TGP), valid for 10 years, would be issued to reflect that decision and the rationale behind it. A new Allotment Management Plan (AMP) would then be developed for Buckhorn Allotment. The AMP is the implementing document for the selected alternative. Then, Annual Operating Instructions (AOIs) would be presented to the Permittee every year, outlining the specific instructions for livestock grazing for a particular year, based on annual forage monitoring and range conditions. These terms (TGP, AMP, AOI) are defined in section 1.11.

## **1.2 Background**

Buckhorn Allotment is located on the RRRD and MRRD, and encompasses approximately 42,000 acres. About 10,000 of those acres are part of the West Clear Creek Wilderness. However, of those 10,000 acres of wilderness, only about 1,000 acres would continue to be grazed under the proposed action (Appendix 1, Map 6). The remaining 9,000 acres cannot be accessed by livestock due to steep slopes and existing fences. Therefore, about 33,000 acres of the allotment is open to livestock grazing.

The western end of the allotment is located approximately one mile east of Camp Verde, AZ, and one mile south of Rimrock, AZ. The eastern end extends about one mile west of Mahan Park, AZ on the Mogollon Plateau (Appendix 1, Map 1).

The allotment is divided into 20 grazing pastures and 7 waterlots (Appendix 1, Map 2). The current season of use is yearlong, and the current permit authorizes a maximum of 250 head of adult cattle per year. Elevations range from approximately 3,200 feet to 7,000 feet. From west to east, vegetation types range from desert scrub to pinyon-juniper transition zones and to ponderosa pine. The area within the allotment boundary also referred to as the project area in this EA.

### **1.2.1 Grazing Management and History**

Livestock grazing has occurred in the Southwest since European settlement, around 1870. Livestock grazing has been a permitted activity on the Coconino National Forest since its inception in 1908. Grazing of what would become Buckhorn Allotment was heavy and unregulated from the 1870s to the early 20<sup>th</sup> century. Permitting began around 1908 with the establishment of the National Forests. According to the current Permittee's records, the M-Diamond Ranch was established in 1908. The first Buckhorn Allotment grazing permit was issued in 1915. The allotment is not exclusively used by livestock; wild ungulates (deer, elk) have always ranged free over this allotment.



Allotment records show the permit stood at 600 cattle yearlong (CYL) by 1951. In 1962 it was reduced to 500 CYL, and in 1967 it was reduced to 400 CYL. These reductions were for resource protection. In the late 1970s, it is believed that permitted numbers were 300 CYL. Circa 1984 the allotment stocking rate was reduced to 250 CYL, which is the current level.

The last NEPA analysis on this allotment was done in 1990. The decision from that analysis required an intensive rest-deferred rotation grazing system, which shortened the grazing periods in the smaller pastures.

In 1994, the Permittee agreed to defer grazing in Bull Pen and West Clear Creek Pastures until a new environmental analysis could be completed. The deferment was requested due to critical habitat being present for the southwestern willow flycatcher (endangered), and potential habitat for the loachminnow (endangered) and spikedace (threatened). In 1995-1997, the allotment was not grazed. Records are incomplete and a specific reason for no grazing those years could not be found.

In 2000, the present Permittee acquired the permit at 250 CYL and continued the deferral of the Bull Pen and West Clear Creek pastures. The proposed action would continue deferment of those two pastures to protect critical habitat.

The current Permittee has taken an active role in obtaining funding for and implementing allotment improvements to minimize grazing impacts to water quality and wildlife. From 2004-2009, the M-Diamond Ranch obtained grants from the Arizona Department of Environmental Quality (ADEQ), the Arizona Game and Fish Department (AZGFD), and the Arizona Department of Agriculture to reduce non-point source pollution (erosion), and conduct wildlife habitat improvements in several of the winter pastures. In 2008 the current Permittee was named *Wildlife Habitat Steward of the Year* by the Arizona Game and Fish Commission.

The amount of AUMs available and the actual use on Buckhorn Allotment over the last 18 years is shown below:

Table 1: Actual Use Numbers								
Year	AUMs†	Permittee Actual Use‡	Year	AUMs	Permittee Actual Use	Year	AUMs	Permittee Actual Use
1991	3000	250	1997	0	0	2003	2317	193
1992	3000	250	1998	180	15	2004	3386	282
1993	3000	250	1999	225	19	2005	3072	256
1994	3005	250	2000	1083	90	2006	3322	277
1995	0	0	2001	2966	247	2007	3000	250
1996	0	0	2002	2756	230	2008	3050	254

† AUM – Animal Unit Months (amount of forage a mature cow consumes in a month) available on the allotment that year

‡ Actual Use – This is the number of livestock that actually grazed the allotment that year



Over those 18 years (1991-2008), actual use averaged 83% of the permitted numbers of livestock. The actual stocking level was less than the maximum permitted number due primarily to operational requirements and dry years.

Although the average shown above is skewed by the years in which no grazing occurred, it is accurate to say that overall, actual use has been less than permitted use.

The current AMP, dated April 2, 1991, authorized the construction of range improvements which were to be completed over the course of six phases. Grazing management was to be modified following each phase. Each phase was intended to resolve conflicts between elk and livestock. Monitoring was also adjusted following each phase. Monitoring was conducted to track elk grazing patterns, evaluate the degree of elk utilization, and evaluate the effects of elk and livestock grazing on forage. Monitoring showed heavy use by elk in the rest pastures of the summer country. Therefore, additional numbers of livestock could not be authorized. By 2003, all improvements specified in the 1991 AMP were completed, including a well and pipeline in the winter pastures to enhance water distribution and thus, livestock distribution.

### **1.2.2 Rangeland Suitability and Grazing Capacity**

Rangeland suitability is not evaluated in this EA. According to the Forest Service Region 3 Grazing Permit Administration Handbook (FSH 2209.13, Chapter 92.23a), rangeland suitability was made as a final determination during plan development for all current Forest Plans developed under the 1982 rule, provisions section 219.20. Therefore, suitability does not need to be readdressed at the project level for rangeland projects guided by current forest plans, developed under the 1982 rule. The Coconino Forest Plan was developed under the 1982 planning rule.

The grazing capacity of a land area is dependent upon the interrelationship of the soils, topography, forage production, and the level of management applied. Grazing capacity is an estimate, and is expressed as one of three capacity classes (Region 3 Rangeland Analysis and Management Training Guide; June, 1997; 2.8-2.10). The specific procedures on how lands are classified into each of these categories can be found on pages 8-10 in the range specialist's report, in the project file.

The three grazing capacities are:

- *Full Capacity (FC)* - areas that can be used by grazing animals under proper management without long-term damage to the soil or vegetative resource. They must also produce a minimum of 100 pounds per acre of forage and be on slopes less than 40 percent.
- *Potential Capacity (PC)* – areas that could be used by grazing animals under proper management, but where soil stability is impaired or existing range improvements are not adequate to obtain necessary grazing animal distribution. Grazing capacity may be assigned to these areas under a conservative allowable use.



- *No Capacity (NC)* – areas that cannot be used by grazing animals without long-term damage to the soil resource or plant community, or are barren or naturally unproductive. It includes areas that produce less than 100 pounds per acre of forage and/or are on slopes greater than 40 percent. Grazing capacity is not assigned to sites with a “no capacity” classification.

The Forest Plan contains a guideline which states that we only assign grazing capacity to full capacity lands. However, this is a general guideline, not a standard. Therefore, it allows us the flexibility to assign numbers to an allotment, based on a site-specific analysis, even though it might not contain just full capacity lands. This EA is a site-specific analysis that would allow that flexibility.

Pages 9-11 of the range specialist’s report contain a detailed description of the procedures used to classify the acres of soil within Buckhorn Allotment. The classifications were made by evaluating the following characteristics of the landscape:

- Information from the Terrestrial Ecosystem Survey of the Coconino National Forest.
- Slope classification information, using Geographical Information Systems and Digital Elevation Slope Modeling
- Soil condition/soil stability data and information
- Forage production data

Soil conditions were broken up into three classes, satisfactory, impaired and unsatisfactory. The following AUM capacities were calculated for Buckhorn:

<b>Table 2: Soil Condition on Buckhorn Allotment</b>			
<b>Soil Condition†</b>	<b>Grazing Capacity‡</b>	<b>Acres</b>	<b>AUMs</b>
Satisfactory	Full	8626	1203
	Potential	4279	451
	None	165	0
Impaired	Full	None	N/A
	Potential	11,467	838
	None	356	0
Unsatisfactory	None	3655	0
Satisfactory, but inherently unstable soils	None	6316	0
<b>TOTALS</b>	<b>N/A</b>	<b>34,864</b>	<b>2493</b>

† For a definition of these terms, see the Appendix

‡ This is further broken down by slope class in the range specialist’s report in the project file.

The current maximum grazing capacity for Buckhorn Allotment was calculated to be about 2,500 AUMs, or 210 CYL. This is what the allotment could support right now. This does not mean the allotment does not have the potential to support more cattle if conditions change.



An Animal Unit Month (AUM) is the amount of forage required by a mature cow (1000 pounds), with or without a calf, for one month. One AUM is about 800 pounds of forage. The Animal Unit Year (AUY) is similar to the AUM, but provides forage for the entire year. So, the Buckhorn Allotment would currently be able to support 2,500 mature cows for one month or 210 mature cows for one year.

If conditions on Buckhorn Allotment change, the AUMs also change. So, if there is a very wet monsoon season, the allotment might be able to support more AUMs that season. More AUMs means more livestock could graze on the allotment that season. Adaptive management would provide the management flexibility to allow the Permittee to graze more cattle if conditions allow. The contrast is also true, if less AUMs are available due to drought; adaptive management provides the flexibility to reduce numbers.

### **1.3 Proposed Action**

The RRRD proposes to make adjustments to livestock numbers and seasons of use, and incorporate the principles of adaptive management to continue to permit cattle grazing on Buckhorn Allotment. A practical definition of adaptive management is:

*The process of making use of monitoring information to determine if management changes are needed, and if so, what changes, and to what degree.*

Maximum permitted livestock numbers on the allotment would be 3,300 AUMs (275 CYL) during times of favorable climate, once desired conditions for vegetation and soil have been achieved. This level of grazing would not be supported by current conditions and therefore, grazing would be initially authorized at a lower level, while conditions are monitored.

Adaptive management is a process that allows the Forest Service to deal with uncertainty and changing conditions over time. It provides the Responsible Official with “constrained flexibility” to adapt to changing conditions or unanticipated resource responses. In adaptive management, we focus more on what we want the ground to look like and what actions are necessary to get there, rather than focusing strictly on how many cattle to permit or which fence to build.

If monitoring data shows a change is needed in some aspect of management, there are certain pre-defined options the Responsible Official can choose from (see Section 2.2.2 F). In other words, we evaluate several “If this...than that” scenarios. By evaluating those scenarios now, we can respond to them in the future without additional NEPA analysis, allowing us to quickly respond to the changing needs of the land.

The management criteria and adaptive management options discussed in Section 2.2.2 of this EA were developed by an interdisciplinary team in the development of the proposed action, which is designed to:

- Meet or adequately move towards meeting desired conditions in the Forest Plan.
- Provide adaptive management flexibility to allow us to quickly respond to the needs of the land.
- Contribute positively to the general economic and social vitality of the local area



- Maintain a viable ranching operation for the M-Diamond Ranch to help retain the western heritage of the county and meet the intent of Forest Service policy (section 1.6).
- Continue improving resource trends or maintain currently satisfactory resource conditions as appropriate.

For this analysis area, resource impacts from livestock were evident more from historical grazing practices, and the type of grazing system that has been implemented in more recent years, such as continuous use or double grazing in the narrow pastures. This analysis focuses primarily on upland vegetation and soil conditions, which are the resource areas where conditions are not satisfactory.

Because the effects are so widespread, it would be too difficult to describe every area that has vegetation and soils that need improvement. Appendix 1, Map 3 shows the soils that need improvement. Generally, where soil needs improvement is also where vegetation needs improvement. These are the areas we want to improve through the proposed action and adaptive management.

#### **1.4 Legal Location/Analysis Area and Scope**

The study area for the Buckhorn Allotment Rangeland Management Analysis is located in:

- T14N, R6E, Sections 1-4, 9-16, 21-29, 32-36
- T14N, R7E, Sections 25-36
- T14N, R8E, Sections 19-36
- T14N, R9E, Sections 19-36
- T13N, R6E, Sections 1-5, 10-12
- T13N, R7E, Section 6
- T13N, R9E, Sections 2-3

The analysis area includes one grazing allotment, administered by the RRRD. The allotment is located within Coconino and Yavapai Counties.

The scope of this analysis is limited to evaluating the potential impacts of:

- Livestock grazing on the defined study area, given considerations of rangeland condition and goals and objectives from the existing Forest Plan.
- Range improvements (fences, pipelines, cattleguards, drinkers)
- Adaptive management strategies
- Vegetation treatments in Heifer Pasture

This analysis does not address recreational use of livestock or outfitter and guide livestock. This analysis is not being conducted to authorize any other forest management activities, such as timber harvest, prescribed burning, or trail construction.

Although a TGP is valid for 10 years, this proposal and analysis is not limited to that 10-year timeframe. If the decision is made to implement the proposed action, or a variant of the proposed action, it would remain valid until the agency has reason to change it. In other words, if the strategies put in place with the decision are working, a new proposal and analysis would not necessarily need to be done when the permit is again up for renewal.



## **1.5 Purpose and Need**

The purpose and need is an explanation of what we aim to accomplish through an action (purpose) and why we are considering that action (need).

### **1.5.1 Purpose**

The purpose of the proposed action is to reauthorize livestock grazing on Buckhorn Allotment in a manner that would maintain current resource conditions where allotment conditions are satisfactory, or move resource conditions towards consistency with the Forest Plan standards, guidelines, goals and objectives, where they are not satisfactory.

Where consistent with other multiple use goals and objectives, there is congressional intent to allow grazing on suitable lands (Multiple Use Sustained Yield Act of 1960, Wilderness Act of 1964, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976). Also see Forest Service policies listed in Section 1.6.

### **1.5.2 Need**

The Permittee's 10-year TGP is about to expire, and the Permittee would like to renew their grazing permit for another 10 year term. There is a need for change from current management because portions of Buckhorn Allotment are not meeting or moving towards desired conditions. Monitoring data (see section 1.8) has shown some disparities between the existing condition of the land and the desired condition. The condition of the land in some areas is currently not meeting specified Forest Plan Standards and Guidelines (Appendix 2).

A list of needs identified on the allotment is presented below. Livestock grazing and associated management activities have contributed towards those needs; however, they are not the sole cause. Livestock grazing is but one of many activities that occur on the allotment. However, since this analysis is specific to livestock grazing, it discusses the management of livestock in response to those needs and how livestock grazing may or may not be used to address those needs. The various other forest uses that have contributed towards the listed needs are identified in the cumulative effects catalog of actions (Appendix 3). One major contributor to the needs listed below is unmanaged recreation, specifically off-road vehicle travel. Off-road vehicle travel is currently being evaluated in a separate environmental analysis.

Specific needs include:

1. There is a need to protect sensitive riparian habitat and reduce potential conflicts between grazing and recreational uses in Clear Creek Pasture.
2. There is a need to address unstable soils and sensitive riparian habitat in 418 acres of Bull Pen Pasture.
3. There is a need to address unsatisfactory soils resulting from the dominance of invasive species in the western portion of Heifer Pasture.
4. There is a need to treat the invasive species – acacia, catclaw, and mesquite in the western portion of Heifer Pasture.



5. There is a need to meet Forest Plan guidance to leave water in livestock troughs deemed important for wildlife use after domestic animals have been removed from the grazing unit (Forest Plan pg. 68).
6. There is a need to improve the distribution of cattle to reduce the extent of bare soil and increase species composition throughout Clear Creek, Boulder, and Heifer Pastures.
7. There is a need to repair and modify existing fencing to reduce cattle impacts at existing water sources and springs, and to reduce impacts to wildlife species.
8. There is a need to reduce the amount of bare soil across the majority of the allotment.
9. There is a need to increase the thickness of the litter layer across the majority of the allotment.
10. There is a need to increase basal vegetation over about 1/3 of the allotment.
11. There is a need to increase the diversity of desired native species across the allotment.
12. There is a need for a more even spread of vegetative species among the three seral stages across the allotment.
13. There is a need to improve vegetative cover for nesting and rearing habitat for meadow/grassland species, including Merriam's turkey.
14. There is a need to conduct watershed restoration work in the Wickiup Watershed.

There is an overall need for greater management flexibility to cope with fluctuations in environmental and social conditions, such as changes in weather; responding to different visitor-use patterns; responding to Permittee requests for operational adjustments and range improvements; and, responding to unforeseen issues.

#### **1.6 Relationship to Other Statutes and Policies**

Although this project relates to numerous environmental laws and Forest Service Policies, the most pertinent are:

- **Range Rescission Act (1995)** – Required national forests to develop a schedule by which they would complete NEPA analyses on allotments. This is also known as the Burns Amendment.
- **Clean Water Act (1976)**- Requires that activities on national forest system lands including livestock grazing, must meet the intent of the Federal Clean Water Act, “to restore and maintain the chemical, physical, and biological integrity of the Nation's waters”.
- **National Environmental Policy Act (NEPA) (1969)** – Requires that environmental impacts associated with federal activities be analyzed and disclosed to the public and that environmental impacts be considered in decision making.
- **Multiple Use Sustained Yield Act of 1960, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976** - Where consistent with other multiple use goals and objectives there is Congressional intent to allow grazing on suitable lands.
- **Endangered Species Act of 1973** – Provides protection for critically imperiled species and the ecosystems on which they depend from extinction as a consequence of human actions.



- **Forest Service Manual 2203.1; 36 CFR 222.2 (c)** - It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for grazing consistent with land management plans
- **Forest Service Manual 2202.1** - It is Forest Service policy to continue contributions to the economic and social well being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood.
- **United States Department of Agriculture Strategic Plan FY 2010-2015** – Objective 2.1 –Restore and Conserve the Nation’s Forests, Farms, Ranches, and Grasslands.

### 1.7 Conformance with the Forest Plan

The proposed action is consistent with the overall management direction in the Coconino National Forest Plan (Forest Plan). The Forest Plan is being implemented as required by the Forest and Rangeland Renewable Resources Planning Act of 1974 (PL 93-378) and the National Forest Management Act of 1976 (PL 94-588).

The Forest Plan provides a framework for the proposed action.

<b>Table 3: Land Management Plan Conformance</b>	
<i>Name of Plan</i>	Coconino National Forest Plan – Amendment 20
<i>Date Published</i>	2004
<i>Page</i>	23
<i>Type of Language</i>	Forest Goal for Range
<i>Specific Language</i>	Emphasize high quality range forage and improvements

The Forest Plan also specifies standards and guidelines for rangeland management. A comprehensive list of those standards and guidelines is presented in Appendix 2.

The proposed action responds to the goals and objectives outlined in the Forest Plan and subsequent amendments. The Forest Plan provides direction for all resource management programs, practices, uses, and protection measures on the Forest. The Forest Plan is available for review at either the RRRD in Sedona, AZ, the MRRD in Happy Jack, AZ, the Coconino Forest Supervisor’s Office in Flagstaff, AZ, or online at:

<http://www.fs.fed.us/r3/coconino/projects/plan-revision/current-plan.shtml>

The analysis area includes various management areas that were assigned by the Forest Plan. Appendix 1, Map 4 shows the management areas in Buckhorn Allotment. A description of the management areas is included in a table in Appendix 2.

Livestock grazing and range management are identified as having emphasis for several of the management areas. There are also some management areas that do not emphasize livestock grazing. However, just because an activity does not receive management emphasis in a particular area does not mean it is prohibited in that area. Livestock grazing is an acceptable use of all land within Buckhorn Allotment.



## 1.8 Existing Condition and Trend

Rangeland condition is evaluated by measuring how well ecosystem processes are functioning on the land. Evidence of properly functioning processes is expressed largely through the vegetative and soil components of each community. Table 4 describes some generalized qualitative differences between rangelands in excellent and poor condition.

Table 4: Comparison of Rangeland Conditions	
Excellent Rangeland Condition	Poor Rangeland Condition
Desirable plants abundant	Desirable plants absent or few
Desirable plants vigorous	Desirable plants stressed
Diverse age structure in plant community	Structure confined to single age
Increased diversity of plant species	Little diversity in plant species
Litter present and contacting soil	Litter absent or not contacting soil
Sufficient vegetation	Insufficient vegetation
Little bare ground	Excessive bare ground
Water soaks into ground	Water runs off ground
Sufficient litter cover	Insufficient or excessive litter cover
Soil surface protected by plants or litter	Soil surface exposed

Trend is determined where possible by comparing historical records (transects, plots, inspection records, etc.) and photographs with current conditions, and determining if conditions have improved, declined, or stayed the same. These trends are described as upward, downward, and static. Areas for which no historic data was available were evaluated based on current conditions and knowledge.

### 1.8.1 Trend Analysis Using Frequency and Canopy Cover Data

Existing condition and trend were developed using two types of data, frequency data and canopy cover data. Buckhorn Allotment was divided into a winter zone and summer zone (Appendix 1, Map 6), and the frequency and canopy cover data were collected. See pages 11- 22 of the range specialist's report for additional details on data collection and how the data was used. The results and conclusions are summarized in Tables 5-7.

*Note: Where TES is used in this section, it refers to Terrestrial Ecosystem Survey.*

#### A. Frequency Data

Table 5: Frequency Data - Ground Cover on Buckhorn Allotment†		
Factor Evaluated	Winter Zone Evaluated With 16 Sampling Sites	Summer Zone Evaluated With 14 Sampling Sites
Mean Bare Soil	13 of 16 sites above TES potential 3 of 16 sites below TES potential	11 of 14 sites above TES potential 3 of 14 sites below TES potential
Litter	8 of 16 sites above TES potential 8 of 16 sites below TES potential	4 of 14 sites above TES potential 10 of 14 sites below TES potential
Basal Vegetation	11 of 16 sites above TES potential 5 of 16 sites below TES potential	10 of 14 sites above TES potential 4 of 14 sites below TES potential

† The numbers presented here represent a deviation from the TES potential. The TES potential is the desired condition.



### Ground Cover Conclusions from Frequency Data

Ground cover trend across the allotment was assessed using data collected in the 1960s, 1990s, 2006, and 2008. Records of moisture were included in the analysis to help determine trend, but the influence from precipitation was not easily discernable. In some instances bare soil increased independently from increases or decreases in moisture. The same holds true for litter and basal vegetation. Without accurate records of other variables such as stocking rate and utilization, the reasons for increases and decreases in trend are difficult to ascertain. However, the following conclusions could be drawn:

- Bare soil is above desired levels at 80 percent of the sites that were sampled across the allotment. In other words, there is too much bare soil in the allotment. This indicates a need for management action.
- Litter layers are below desired levels in over 50 percent of the sites that were sampled across the allotment. In other words, the litter layers need to be increased. This indicates a need for management action.
- Basal vegetation was either meeting or exceeding desired levels in 70 percent of the sites that were sampled across the allotment. It was below desired conditions in 30 percent of the sites, indicating somewhat of a need for improvement.

<b>Table 6: Frequency Data – Species Composition on Buckhorn Allotment</b>		
	<b>Winter Zone</b>	<b>Summer Zone</b>
TES Cool Season Species	2 of the 8 predicted species were observed	6 of the 8 predicted species were observed
TES Warm Season Species	7 of the 17 predicted species were observed	8 of the 11 predicted species were observed
Note 1: Blue grama represented 25% and sideoats represented 20% of 1,676 species observations in the winter zone. Note 2: Blue grama represented 63% of 1,941 species observations in the summer zone		

### Species Composition Conclusions from Frequency Data

Observed cool season and warm season species in the winter zone and summer zone, across the allotment, were less than what was predicted by the TES. This shows a lack of diversity in desired species across the allotment. Additionally, the dominance of blue grama indicates an overall lack of diversity across the allotment. With regard to species composition, the allotment is in need of improvement. This indicates a need for management action.

### **B. Canopy Cover Data**

Table 7 shows the distribution of grass similarity and all species similarity among the 3 seral state classifications. For example, 5 of the 8 winter TES units (62.5%) expressed an early seral state composition with respect to grass species alone. Blue grama was expected in 10 of the 13 TES units sampled. It appeared in 5 different TES units; once in a TES unit where it was not a percent natural cover species. Where blue grama was encountered, its cover greatly exceeded that predicted by TES.



	Table 7: Canopy Cover Data			
	Winter TES Units		Summer TES Units	
	Grasses	All Species	Grasses	All Species
<b>Low (0-33% similarity)</b> <b>Early Seral</b>	62.5%	75%	60%	60%
<b>Mid (34-66% similarity)</b> <b>Mid Seral</b>	25%	12.5%	20%	20%
<b>High (67-100% similarity)</b> <b>Late Seral</b>	12.5%	12.5%	20%	20%

### Species Composition/Canopy Cover Conclusions

Table 7 shows the majority of the units are in an early seral stage. This indicates a need for management action to increase the distribution among seral stages. Having the species more evenly spread across the three seral stages would more closely represent the PNC predicted by TES.

Blue grama exhibited high frequency and cover. It typically grows as a bunchgrass in southern states, or as a sod-former in areas of heavy grazing pressure ([http://plants.usda.gov/factsheet/pdf/fs\\_bogr2.pdf](http://plants.usda.gov/factsheet/pdf/fs_bogr2.pdf)). During routine allotment inspections, regular observations of blue grama growth have occurred, primarily in the summer zone.

The historic high incidence of blue grama frequency and cover is an indicator that vegetative diversity needs slight to moderate improvement at certain sites in certain TES units. Arguably, blue grama could be responsible for high basal vegetation values expressed by 4 of the 7 winter TES units and all those in the summer. However, these assumptions are debatable. Graphs on pages 19 and 20 of the range specialist's report suggest the effect of management within the last decade has promoted less abundant species such as western wheatgrass, hairy grama, and curly mesquite in the winter zone, and pine dropseed, western wheatgrass, spike muhly, and mountain muhly in the summer zone.

So, due to the Permittee's management actions, the allotment may even be in an upward trend with respect to species composition. However, the existing, documented canopy cover data indicates a need for management action to move towards the desired conditions.

### **1.9 Desired Condition**

The need for a change in management is identified by comparing specific descriptions of what is desired across the landscape to what currently exists. Desired conditions are the on-the-ground resource conditions that management is working towards. These are the expected results if management goals are fully achieved. These expected results are how we bring broad scale desired conditions from the Forest Plan down to the project level.

Based on the identified disparities, Table 8 shows the specific measurable desired condition goals/objectives for Buckhorn Allotment.



Table 8: Goals and Objectives for Buckhorn Allotment	
Condition	Goals/Objectives Across the Allotment†
Ground Cover	Maintain ground cover attributes (bare soil, basal vegetation, litter) in amounts that approximate potential as determined by the Terrestrial Ecosystem Survey.
Species Composition	Have all the successional stages represented across the landscape for biological diversity.  Refer to Appendix 5 (pages 54-74) of the range specialist's report for an in-depth comparison of existing and desired species in specific TES plots.

† All measurements would involve comparing observed conditions to that which is predicted by TES. TES desired values can be found on the Coconino National Forest TES website at <http://alic.arizona.edu/tes/tes.html>

The desired condition for Buckhorn Allotment is a condition that would provide for livestock grazing in a manner that would comply with the standards and guidelines addressed in the Forest Plan. If the proposed action is approved, the desired conditions in Table 9 would be evaluated pasture by pasture, based on trend data.

Table 9: Buckhorn Desired Conditions†	
Broad Category	Project Specific Desired Condition
Ground Cover in Grassland Parks	Should be adequate to prevent erosion and to maintain soil productivity
Condition of Uplands	vegetative conditions should be "satisfactory" or moving toward satisfactory condition based on trend analysis conducted by the range staff
Gullying and Headcutting	No new gullying or headcutting should be evident on hillslopes or within grassland parks. Gullies and headcuts created in the past should be healing.
Water Quality	Meet State of Arizona water quality standards

† The numbers obtained from our existing plots would be considered our baseline data. What we would measure is any increase towards or decrease away from the desired condition, relative to the baseline. TES desired values can be found on the Coconino National Forest TES website at <http://alic.arizona.edu/tes/tes.html>

### 1.10 Tiering and Incorporation by Reference

The proposed action includes triclopyr herbicide treatment of mesquite, catclaw, and acacia within the western half of the Heifer Pasture (see Section 2.2.2B for details). This EA does not analyze the effects of using triclopyr herbicide because those effects have already been fully analyzed. The *Final Environmental Impact Statement (FEIS) for Integrated Treatment of Noxious or Invasive Weeds on the Coconino, Kaibab, and Prescott National Forest within Coconino, Gila, Mojave, and Yavapai Counties, Arizona*, completed in 2004, analyzed the effects of 21 different herbicides, including triclopyr. The environmental consequences are discussed on pages 115-226 of that FEIS.

Under the proposed action for this EA, triclopyr would be used in the same manner as was analyzed in the FEIS. A Record of Decision (ROD) was signed for the FEIS in 2004, approving the use of herbicides. Therefore, there is no need to re-analyze the effects of triclopyr, and this EA is tiered to that FEIS. This means the analysis of effects in the FEIS is incorporated into this EA by reference. The use of triclopyr is being discussed in this EA because the FEIS did not propose to treat mesquite, catclaw and acacia. Therefore, a separate decision is needed to treat those three plants. The FEIS and ROD are available to the public at:

<http://www.fs.fed.us/r3/coconino/nepa/2005/feis-weeds/index.shtml>



Additionally, an Environmental Assessment for the Buckhorn Allotment Watershed and Wildlife Improvement Project (BAWIP EA) in 2005 described the specific treatment of mesquite with herbicides. A Decision Notice (DN) and Finding of No Significant Impact (FONSI) was signed for the BAWIP EA. The BAWIP EA, DN and FONSI can be reviewed at the RRRD. The decision for that EA concluded the following:

*The herbicide and application method are approved for this use and are safe. The Nature Conservancy has used the same herbicide and application method in their Hassayampa Preserve for control of tamarisk.*

Due to the way triclopyr is applied and how quickly it breaks down in the environment (45 days), no concerns to humans, animals or the environment have been identified in association with its use. Therefore, the use of triclopyr is only briefly discussed in this Environmental Assessment, with references to the FEIS and the BWIP EA.

### **1.11 Decision Framework**

Given the purpose and need, the Responsible Official would review the proposed action and alternatives in order to make the following decisions:

- Would livestock grazing continue to be authorized on all, part, or none of the project area?
- If grazing is authorized at some level, what management prescriptions would be applied to ensure that desired condition objectives are met or that movement occurs towards those objectives in an acceptable time frame?
- If grazing is authorized, what types of associated activities (range improvements) would occur?
- What design criteria, mitigation measures, and monitoring would apply to the project.
- Would restoration work occur in the Wickiup Watershed?
- Is a more in-depth analysis (Environmental Impact Statement) needed?

The Responsible Official must then decide what, if any, changes in livestock management should occur in order to improve existing conditions, address the needs listed in Section 1.5.2, and to achieve the desired condition goals identified in the Forest Plan. This would also include decisions on the construction of new fences and water developments as described in the proposed action (section 2.2.2). If a decision to continue livestock grazing on Buckhorn Allotment is made, the following permit, plan and instructions would be required.

- **Term Grazing Permit (TGP)** – authorizes the permit holder (the Permittee) to graze livestock (specifies numbers, kind, class, and season of use) on specific National Forest System lands. The Permittee is required by the permit to graze under specific terms and conditions designed for resource protection and enhancement. TGPs are typically issued for a 10-year term. TGPs by themselves do not authorize the Permittee to develop water improvements, construct fences, build roads or trails, manipulate vegetation, or do other ground-disturbing activities.
- **Allotment Management Plan (AMP)** – an administrative document developed jointly by the Forest Service and Permittee. It incorporates the decisions made in the decision



from the environmental analysis. The AMP is not a decision document; it simply documents the management requirements and actions that are specified in the decision from a NEPA analysis. A Bill-For-Collection establishes the numbers and season of use approved for the grazing year. Once the FS receives the payment, the numbers and season are carried over into the AOIs.

- **Annual Operating Instructions (AOIs)** – on an annual basis, these documents provide instructions to the term permit holder (the Permittee) regarding management requirements, projects, agreements, and so forth for the current grazing season. They are not decision documents; they simply implement, on an annual basis, the NEPA decision made by the Responsible Official. Each year, the authorized numbers and season would be specified in these instructions.

If the Responsible Official decides livestock grazing can continue on Buckhorn Allotment, the resulting Decision Notice is the only document that can authorize the livestock grazing and construction of range improvements. The above permit, plan and instructions would be the methods used to implement that decision.

### **1.12 Public and Permittee Involvement**

Several methods were used to inform the public, Permittee, local governments, tribes, and others of the proposed action and solicit comments and concerns, including:

- The project has been listed in the quarterly Schedule of Proposed Actions since January 2007.
- The Permittee has been involved since early in the development of the proposed action.
- Seventy scoping letters were sent to interested individuals and organizations and adjacent landowners on March 13, 2009.
- Eight additional scoping letters were sent to private property owners on March 25, 2009.
- The proposed action was available for review on the Coconino National Forest website.

As a result of scoping, seven responses were received. None of the scoping responses stated an opposition to the project. The scoping comments were either neutral or specified desired topics to be covered in the environmental analysis. Some of the requests were outside the scope of this analysis. The scoping comments are included in the project record. The scoping comments did not result in the consideration of a new action alternative.

The Permittee was kept informed of the project through annual spring meetings, annual inspection summaries and specific meetings related to this analysis. Copies of NEPA mailing lists and SOPA publications are included in the project record.

### **1.13 Issues Raised For Analysis**

An issue is an effect on a physical, biological, social, or economic resource. An issue is not an activity in itself; instead, it is the projected effects of the activity that create the issue. For example, livestock grazing is an activity, but its effects on a resource can form an issue. A key issue is an issue that suggests taking a different course of management action. The following key and general issues were identified from internal and external scoping efforts.



### 1.13.1 Key Issues

These are the issues the Interdisciplinary Team and Responsible Official determined were most important to assess when designing and evaluating alternatives.

- **Condition of Upland Vegetation and Rangeland** - Historical livestock grazing practices, rangeland management actions, drought, fire, wildlife foraging, off-highway vehicle use, and other land uses have altered the composition of grassland communities within the analysis area. Several potential natural community (PNC) species have decreased in favor of less desirable species, and vital ground cover components are lacking. The existing state of vegetation inhibits proper ecosystem functioning.
- **Soils** - Generally, bare soil is above desired threshold levels, this inhibits proper ecosystem functioning and leads to erosion and the sedimentation of streams.
- **Wildlife** – The Permittee expressed concern over the amount of grazing being done by elk. The Permittee wanted to make sure it was recognized that not all grazing impacts are from livestock. In addition, AGFD is concerned about the habitat available for Merriam's turkey. The combination of elk and domestic livestock grazing has reduced vegetation in grasslands and meadows to a level not suitable for turkey. Although the Forest Service works cooperatively with AZGFD, the population of elk is managed by AZGFD and outside Forest Service control.
- **Economic, Cultural, and Social values** – Livestock grazing has been a use of public lands within the analysis area for over 100 years. A stable ranching community has contributed to the local economy through the payment of property taxes, livestock sales, providing grass-fed beef, and supporting other local businesses. Ranching families have been a key element in the traditional social and cultural fabric of the area. Ranching is part of the local culture of most small western communities, and there is a strong desire by communities to retain this culture. Ranches also provide open space and wildlife habitat on private lands. The M-Diamond Ranch is surrounded by national forest and thus is part of the greater Coconino ecosystem. A change in the use of these lands from agriculture to more intensive uses such as housing developments would fragment privately owned lands, eliminate habitat, and eliminate part of the western heritage of the community.

The key issues form the basis for the development and comparison of the proposed action and the alternatives.

### 1.13.2 General Issues

These are other issues or concerns that were identified but were not determined to be concerns great enough to result in the development of alternatives. Usually, an issue remains a general issue when it is addressed the same way in all alternatives for all projects of a certain nature, and thus does not lead to the generation of a unique alternative. Usually, it is something already identified and addressed with routine practices, or within another document, such as the Forest Plan.



- **Cultural Resources** – Livestock grazing and structural range improvements have the capacity to affect cultural heritage sites. Cultural surveys are routinely conducted for ground disturbing activities. Protection or avoidance of cultural sites would occur where necessary.
- **Invasive Species/Weeds** - The movement of livestock through pastures has the capacity to transport noxious weeds and contribute to their spread on public land. Mapping of noxious weed infestations and treatment of noxious weeds is a routine activity that occurs as necessary.
- **Water Quality and Fisheries** – Historical grazing activities are believed to have contributed to erosion around some watercourses in the project area. Due to the Permittee's active involvement in improving the allotment, current grazing is not believed to substantially contribute to this damage, and this was made a general issue. Measures would be taken as appropriate to stabilize eroded areas as necessary. Domestic livestock also produce waste which affects the water quality in ponds and watercourses. If Arizona water quality standards are exceeded, measures would be taken to meet the standards.
- **Recreation** – Livestock take up space on public lands, leave waste on public lands, displace wildlife, displace forest users, and can be a road hazard. This affects the recreational experiences of some other forest users.
- **Visuals** – The management of livestock can affect scenery in various ways. The construction of fences, cattleguards and water developments affect scenery. The amount of vegetation consumed by livestock also affects scenery.

The use of tricolpyr herbicide was not considered to be an issue because its effects have been extensively studied and documented in an EIS (Section 1.10).

The mere presence or absence of livestock on public land is not addressed in this analysis. It is well recognized that some forest users do not want to see livestock grazing on public lands and think they should be removed from all public land because they are a non-native, introduced species. However, in strong contrast, there are other recreational users that expect to see livestock grazing on public lands as a traditional use and symbol of the west. How livestock are viewed by the public differs greatly depending on one's background and values. The debate on whether or not livestock grazing should occur on public lands cannot be addressed at the local level and is outside the scope of this analysis. Comments on this issue would need to be directed to Congress.

#### **1.14 Adaptive Management Options**

The adaptive management options for Buckhorn Allotment would provide tools that could be used to meet or move the allotment towards desired conditions within an acceptable timeframe. Adaptive management options are implemented when monitoring shows desired conditions are not being met within acceptable timeframes. Adaptive management strategies would be reviewed with the Permittee prior to implementation. The acceptable adaptive management options the Responsible Official may choose from are listed in Section 2.2.2 F.



### 1.15 Other Related Efforts and Activities Within the Analysis Area

Livestock grazing is not the only activity that occurs on Buckhorn Allotment. Other activities include:

- **Mechanical fuels reduction projects (thinning and hydromowing)** – Fuels reduction projects across the forest are ongoing to create more fire-resistant stands and improve the overall health of the stands. These types of treatments would be expected to continue.
- **Prescribed burning** – Since ecosystems in the southwest evolved with fire, prescribed burning efforts are expected to continue in conjunction with mechanical fuels treatments and commercial timber sales. Structural range improvements need to be protected during prescribed burns. Livestock rotations may need to be adjusted to accommodate these treatments.
- **Noxious weed treatments** – Weed infestations are mapped and weeds are treated aggressively with herbicides. Mapping and treatment of new infestations is expected to continue.
- **Travel management and public recreational use** – Although the land is managed for multiple use, some recreational activities, particularly unregulated OHV use has detrimental effects on rangeland resources through gates being left open, soil erosion, vegetation destruction, cattle being chased or disturbed, tampering with range improvements, wheel rutting which changes drainage patterns, and disruptive noise. The Coconino National Forest is addressing travel management under a different environmental analysis. Information gathered in this analysis and decisions made from this analysis would be considered in future travel management analyses.

The Coconino National Forest Travel Management homepage can be accessed at the following address:

<http://www.fs.fed.us/r3/coconino/tmr.shtml>

These other activities and their effects are brought forward as appropriate for discussion in the cumulative effects sections.

### 1.16 Considering Climate Change

We know climate changes occur. There are many factors which affect Earth's global climate, such as solar cycles and ocean currents. In addition, there is much discussion over the possible impacts of human influences, especially in regards to greenhouse gasses. Changes in climate, regardless of their cause, affect the environment in various ways. For example, the Little Ice Age (1450-1850) was a period of global cooling.

Methane, which is produced by the digestion of cattle, is a greenhouse gas. A calculation (Hudak, 2010) showed that each AUM represents 18,600 potential liters of methane. Since 1000 liters is equal in volume to 1 cubic meter, one AUM (consumed by livestock) produces about 18.6 cubic meters of methane per year. Assuming the allotment produces its full amount of



3,300 AUMs per year, and 3,300 AUMs are consumed by livestock each year, Buckhorn Allotment would produce 61,380 cubic meters of methane per year.

Hudak calculated that the annual volume of methane produced each year by cattle on all public lands was 258,329,206,200 liters. This is equivalent to about 260,000,000 cubic meters of methane per year. Converting to a percentage, Buckhorn Allotment's contribution of methane would be about 0.02% of the total methane produced by U.S. public land cattle grazing per year.

Hudak goes on to state that removal of cattle from public land would allow vegetation to be available for wildlife and for soil crusts to begin to recover. He noted that soil crusts are valuable for sequestering carbon. However, Hudak did not take into account the amount of land occupied by private ranches and the value of that open space, habitat, and vegetation that could be lost with the loss of public land grazing.

There is no debate over the harmful effects of unmanaged grazing and overgrazing. However, there is much discussion about the effects of managed grazing. Another study (Pyke and Marty, 2005) concluded that livestock grazing can be a tool to mitigate climate change. They found that with managed cattle grazing, vernal pools (a type of wetland) stayed wet for a longer period of time, to provide critical habitat for aquatic species. Without managed grazing, pools dried up on average 50 days sooner each year.

Lovell and Ward tell us that managed grazing is a more effective restoration tool than mechanical methods and that managed grazing can increase biodiversity and build healthier landscapes. Healthier landscapes, in turn, are more resilient to climate changes. They identified a range site in New Mexico that was subject to unmanaged grazing. The site had low biodiversity, and was 11% snakeweed and 46% bare ground in 1986. By using managed grazing, snakeweed was reduced to 1%, and bare ground was reduced to 30% by 1990. They also noted that nine previously dormant perennial grass species reappeared and 10 feet of water reappeared in a well that had been dry since the 1950s. Additionally, by 1990, herd size per hectare doubled and the cost of producing one kilo of beef decreased by 50 percent.

Lovell and Ward also note that the management of livestock on the U Bar Ranch in New Mexico has resulted in creating a habitat that supports more endangered southwestern willow flycatchers than any preserve.

Regardless of the causes of climate change, our responsibility is to determine effective ways to respond to changes and manage the land effectively. Livestock grazing does appear to be a tool in managing some aspects of the land, and the methane produced from cattle on Buckhorn Allotment is a small percentage of the total produced each year.



## **2.0 Alternatives, Including the Proposed Action**

This chapter describes the alternatives developed to meet the purpose and need for action described in Section 1.5. The proposed action and a no action alternative are described and compared. This chapter also contains a summary of how the alternatives respond to the key issues would meet or not meet objectives.

### **2.1 Alternative Development**

The proposed action was developed through a collaborative effort between the Forest Service and the Permittee, with consideration of all scoping comments. The proposed action was approved by the Responsible Official to respond to the purpose and need, plan direction, key issues, and other concerns raised by the public and the Permittee during scoping and during the analysis. The reasonably anticipated environmental effects of the alternatives are described in Chapter 3.0.

### **2.2 The Proposed Action and Alternatives Considered in Detail**

Two alternatives were developed for this project, the No Action Alternative and the Proposed Action. These two alternatives are described and analyzed in detail.

- The “no action” or “no grazing” alternative which is described as Alternative 1.
- The “proposed action” alternative, which is described as Alternative 2, which involves reauthorizing livestock grazing with specific improvements and adaptive management.

#### **2.2.1 Alternative 1: No Action/No Grazing**

A no action alternative is required by NEPA to be developed as a benchmark against which the agency can evaluate the proposed action. No action in livestock management planning equates to no permitted livestock grazing because no action would be taken to renew the TGP. The TGP would expire and livestock grazing by the current Permittee would no longer be authorized. The livestock would be removed and no new range improvements would be constructed.

Selection of this alternative would not mean that livestock grazing could not be authorized on this allotment sometime in the future. The current allotment and pasture fences and all other structural range improvements would remain in place. A separate analysis and coordination with adjacent Permittees and other agencies, including AZGFD, would be necessary to determine whether to remove or maintain these improvements.

#### **2.2.2 Alternative 2: Proposed Action - Livestock Grazing with Adaptive Management**

Under the proposed action, livestock grazing would continue on Buckhorn Allotment. The grazing would continue to be managed under deferred-rotation and rest-rotation systems. Pasture rotations would be planned in the spring, but they could be modified later in the season to respond to environmental changes.

The season of use would continue to be year-long (365 days) and would generally be used as follows:

- The winter portion of the allotment (from Painted Tank Pasture west – Appendix 1, Map 2) would be used from January 1-June 15 (166 days).



- The summer portion (from Buckhorn Pasture east – Appendix 1, Map 2) would be used from June 16-December 31 (199 days).

This alternative is based on the application of adaptive management, a process that uses monitoring information to determine if management changes are needed, and if so, what changes, and to what degree. This allows the RRRD to cope with uncertainty and changing conditions over time. The flexibility to adapt to changes is constrained by criteria provided in part F of this section.

The Proposed Action presents a maximum possible authorization of 275 CYL. This does not mean that 275 head of cattle would be authorized each year; it is simply a potential maximum if conditions allow for it. If the proposed action is selected by the Responsible Official, the grazing permit would be valid for ten years. Each year, the authorization of cattle could range from 0-275.

#### **A Specific Components of the Proposed Action**

The following points describe the specific components of the proposed action.

1. Permitted livestock numbers would be a maximum of 3,300 AUMs (275 CYL). This is the maximum number of cattle that could be supported during times of favorable climate once the desired conditions for vegetation and soil have been reached. Current conditions would not support this level of grazing; therefore yearly numbers would not be authorized to reach 275 head of cattle until soil and vegetative conditions improve.
2. Annual authorized livestock numbers would be based on existing conditions, available water and forage, and predicted forage production for the year. Adjustments to the annual authorized livestock numbers (increase or decrease) may occur during the grazing year, based on conditions and/or range inspections.
3. The permitted season of use would be yearlong.
4. Grazing would occur through a rotational management system (either deferred or rest-rotation grazing) which would allow for plant growth and recovery.
5. A management guideline of 30 and 40 percent forage utilization, as measured at the end of the growing season, would be employed. The winter zone would use 30 percent utilization and the summer zone would use 40 percent utilization. This utilization would maintain or improve rangeland vegetation and long term soil productivity. See Appendix 1, Map 2 for the zones.
6. Grazing intensity is defined as the amount of herbage removed through grazing or trampling during the grazing period. Grazing intensity would be managed to allow for the physiological needs of plants. A grazing intensity of 30-50 percent would be managed for year-round. This would leave 50-70 percent of the annual forage production for site protection.



7. The grazing period within each pasture would be based upon weather/climate conditions, current growing conditions, and the need to provide for plant re-growth following grazing. The grazing period per pasture would vary; pastures would only be grazed once during the grazing year except on rare occasions when multiple grazes might be necessary. Multiple grazes would only be allowed if certain criteria are met (refer to item 8).
8. During the first two years, no double graze in the narrow pastures (Indian Flat, Painted Tank) would be permitted (refer to Appendix 1, Map 2). Instead, the AOIs for the first two years would call for a spring trail through and a fall graze. This is necessary to allow some rest (by only grazing once) and to have the rest in the spring, which is the critical growing season. After the first two years, a double graze would be considered if monitoring indicates:
- The annual cumulative grazing does not exceed maximum allowable use,
  - The pasture was not grazed in excess of the allowable use the year prior,
  - Leaf litter is maintained or improved, and
  - Species composition shows an increasing trend moving from the existing plant community to the desired plant community.

The Responsible Official, in consultation with the range specialist, would make the decision on whether a double graze could occur. The decision would be documented in the AOIs.

Once a double entry is allowed, a double entry the following year would only be considered if:

- The annual cumulative grazing does not exceed maximum allowable use;
  - The pasture was not grazed in excess of the allowable use the year prior;
  - Leaf litter is maintained or improved;
  - Species composition shows an increasing trend moving from the existing plant community to the desired plant community;
  - Plants fully recovered the prior year between the first (spring) defoliation (graze) and the second (fall) defoliation (graze); and
  - Adequate residual matter and seed heads remained following the second (fall) defoliation.
9. To address concerns occurring within the Wickiup watershed, there is an ongoing effort to identify a feasible watershed restoration plan. The Wickiup watershed is part of the larger West Clear Creek 5th code watershed shown on Map 5 in Appendix 1. The bulk of the work in Wickiup would occur on the adjacent Walker Basin Allotment, but some work may occur on Buckhorn Allotment. Pending the results of currently ongoing survey efforts, the scale of this watershed restoration effort may vary. Possible restoration efforts that would be authorized under this proposed action may include:
- Re-contouring hill slopes,
  - Channel grade stabilization,
  - Lop and scatter within the watershed uplands,
  - Building check- dams within the stream corridor, including connected tributaries,
  - Re-vegetation techniques, and
  - Road closures.



10. The Forest Service requests the Permittee maintain water in stock tanks for wildlife use after domestic livestock have been removed from the grazing unit. Critical water tanks identified for wildlife include: Maxwell, Tramway, and Coyote tanks. See Appendix 1, Map 2 for stock tank locations.

## **B. Areas that Would Be Deferred from Grazing**

### ***Clear Creek Pasture***

Because of resource concerns, grazing would be deferred on 1491 acres of the Clear Creek Pasture, leaving 652 acres open to grazing. Resource concerns include:

- Unsatisfactory and inherently unstable soils on slopes that are greater than 40%;
- A highly used recreational corridor that conflicts with grazing activities;
- Several threatened and endangered wildlife species could be adversely affected if grazing occurs in riparian areas;
- The presence of sensitive riparian areas;
- The presence of many sensitive archaeological sites; and
- A concern that allowing livestock grazing may reverse the current Properly Functioning Condition (PFC) of West Clear Creek.

### ***Bull Pen Pasture***

A 418 acre portion of Bull Pen Pasture would be deferred due to a lack of ecological diversity, the presence of sensitive riparian habitat, and inherently unstable soils. Ninety-seven acres of the west portion would still be open for grazing. These 97 acres would be combined with the portion of Heifer Pasture that would still be open to grazing.

### ***Heifer Pasture***

The western half of the pasture (approximately 580 acres) would be deferred. A new north/south pasture fence would be constructed to redefine the new pasture boundaries. The eastern half would include the 97 additional acres from the Bull Pen Pasture.

The western half would be deferred because of unsatisfactory soils that may be contributing to decreased water quality in the Verde River. Grazing would be allowed on the eastern side, and timing and intensity would be adjusted to reduce impacts on the soils.

Approximately 620 acres of acacia are promoting the unsatisfactory soil conditions in the west half of Heifer pasture. The area would be treated with triclopyr herbicide to produce a positive soil and vegetation trend. Stems and branches would be cut and the herbicide would be applied to the cut areas by hand, with backpack sprayers. No aerial application would occur.

## **C. Important Water Bodies**

Certain water bodies are deemed important for wildlife use because they are the only reliable source of water in the area. It is important that a sufficient amount of water be left for wildlife after domestic livestock have been removed from the grazing unit. These water bodies include:



- Brushy Pasture - Maxwell Tank
- Dukey Pasture - Tramway Tank
- Maxell North Pasture - Coyote Tank

The Forest Service has water right claims for various earthen tanks on the allotment. The claims state that 25-30% of water is to be retained for wildlife. Because the FS only has claims and not water rights (because the adjudication process is not yet complete), the Forest Service can only request the Permittee retain water for wildlife in certain water developments.

#### **D. Improvements**

##### **1. Water improvements would be constructed to improve the distribution of cattle across the allotment.**

- ❖ Approximately 5-7 miles of new water pipeline would be constructed in the following pastures to improve livestock distribution:
  - Heifer Pasture – 1.2 miles of pipeline
  - Cedar Pasture – 2.25 miles of pipeline
  - Winter Pasture – 1.5 miles of pipeline
  - Clear Creek Pasture – 0.2 miles of pipeline
  - Boulder Pasture – 2.25 miles of pipeline
- ❖ Four new drinkers would be placed in the following pastures:
  - 1 drinker in Cedar Pasture
  - 1 drinker in Clear Creek Pasture
  - 2 drinkers in Heifer Pasture
- ❖ A new water storage tank would be constructed in Boulder Pasture.
- ❖ A new corral would be constructed in Willow Pasture.
- ❖ A cattleguard would be installed between Heifer and Bull Pen Pastures on FR 215.

In years of drought or if new wildlife habitat objectives need to be made, additional water developments may need to be identified for livestock and wildlife use.

##### **2. New Fences and Gates would be constructed to improve livestock distribution and management and protect sensitive habitats. All new fences would be constructed to current wildlife standards.**

- ❖ Approximately four miles of electric fence along the Maxwell North, Dirty Name and Dukey Pasture boundaries would be converted to barbed wire.
- ❖ Approximately half a mile of barbed wire drift fence would be constructed in Willow Pasture.
- ❖ Approximately three miles of barbed wire fence would be constructed in Willow Pasture to create a holding area for the proposed corral.
- ❖ Approximately one mile of barbed wire fence would be constructed in Heifer Pasture to exclude livestock from the western third of that pasture.



- ❖ Approximately one mile of barbed wire fence would be constructed in Bull Pen Pasture, such that 97 acres of Bull Pen would be grazed with Heifer Pasture.
- ❖ Approximately one mile of barbed wire fence would be constructed on the south boundary of Clear Creek Pasture.
- ❖ The existing gate at Hance Springs would be converted to a pipegate or walk-through to stabilize the fence and protect the spring.
- ❖ The fence with a partition at Coyote Tank would be reconstructed.
- ❖ The fence with a partition at Maxwell Tank would be reconstructed.

### **E. Monitoring**

Two types of monitoring would be used to evaluate whether desired conditions are being met or if progress towards or away from desired conditions is occurring. These types of monitoring are implementation and effectiveness monitoring.

- *Implementation monitoring* would be conducted on an annual basis by the range staff and the Permittee, and would include: livestock actual use data, grazing intensity evaluations during the time cattle are in a pasture and grazing utilization evaluations at the end of the growing season (within key areas), stubble height, and visual observation of plant composition and ground cover.
- *Effectiveness monitoring* by the range staff would occur within key areas on permanent transects at an interval of 10 years or less to evaluate the success of management in achieving the desired objectives. Effectiveness monitoring may also be conducted if data and observations from implementation monitoring (annual monitoring) indicate a need.

Contemporary qualitative and quantitative monitoring methods would be used in accordance with the Interagency Technical References, Region 3 Rangeland Analysis and Management Training Guide, and the Region 3 Allotment Analysis Handbook. These can be reviewed at the RRRD.

### **F. Adaptive Management**

The Proposed Action includes adaptive management, a strategy that considers various management actions that could be employed to modify the grazing system. Modifications are often necessary because environmental conditions vary. Implementation and effectiveness monitoring would provide the basis for modifying management. Management would be modified in cooperation with the Permittee. Elements of the grazing system that might be modified include: timing, intensity, frequency, and duration of grazing. The likely modifications are analyzed during the NEPA analysis (this EA), and then implemented as needed through the AOIs.

Adaptive management would also allow for the construction of rangeland improvements, if they have been identified, and are determined through monitoring to be necessary for moving the allotment toward desired conditions.



Tables 10-11 show the adaptive management options developed for the proposed action.

<b>Table 10 – Adaptive Management for Allowable Use</b>	
<b>Indicator/Trigger Point The “If” Statement</b>	<b>Adaptive Management Response Options The “Then” Statement</b>
<b>If</b> grazing intensity is in compliance with the 30-50 percent guideline on at least 70% of each pasture.	Continue current management system
<b>If</b> grazing intensity exceeds the guideline in more than 30% of a pasture.	Cows would leave that pasture early despite schedule; the strategy for that pasture the following year would be either to rest it, graze it at lighter intensity, or allow a shorter use period; change season of use or timing of grazing the next year; or increase riding and herding to improve livestock distribution;
<b>If</b> in a 5 year period guidelines have been exceeded twice. or <b>If</b> guidelines are exceeded in two consecutive years and the trend (apparent or measured) is down.	Permit suspension would be considered  Note: Various mitigating factors, such as drought and wildfire would be taken into account.

<b>Table 11 – Adaptive Management for Range Improvements</b>	
<b>Indicator/Trigger Point The “If” Statement</b>	<b>Adaptive Management Response Options The “Then” Statement</b>
<b>If</b> monitoring indicates that livestock are finding a way to cross the eastern-most boundary of the Clear Creek Pasture and/or entering into West Clear Creek.  <small>Note: Livestock grazing is not allowed in the riparian areas associated with West Clear Creek or west of the designated grazing area in the Clear Creek Pasture. This has not been a problem in the past because the livestock have been physically unable to access the riparian areas due to the steep slope of the canyon wall.</small>	Drift fences would be placed at locations shown in green on Map 2 in Appendix 1.
<b>If</b> there is a need to gather livestock in Brushy pasture	A corral would be constructed.
<b>If</b> livestock are ever able to get through a rugged draw into the West Clear Creek Wilderness.  <small>Note: The only place where cattle could access more than the 1000 acres of West Clear Creek Wilderness they would be grazing is if they pass through a rugged draw. So far the cattle have not done this.</small>	Drift fencing would be constructed at the mouth of the draw to exclude the cattle.

### G. The Grazing Management Toolbox

A list of rangeland management options, called the Grazing Management Toolbox, is presented in Table 12. This list is not intended to be all inclusive, but provides a sense for the types of actions available to the RRRD to maintain or improve resource conditions to move towards or meet Forest Plan goals and management objectives. New management techniques, as they are developed, would be incorporated into this toolbox, provided their implementation would be consistent with the effects documented in this EA.



<b>Table 12: Grazing Management Toolbox</b>	
Use of any tool below must consider rangeland condition and other relevant Forest Plan goals and objectives for the analysis area under study.	
✓	Change season of use -- do not exceed the estimated Animal Unit Month (AUM) capacity; use range readiness to determine livestock turn on date and allowable use standards and guidelines to determine livestock off date.
✓	Change livestock numbers -- do not exceed the estimated AUM capacity; use allowable use standards and guidelines to determine proper rangeland use and time to move livestock (including off date).
✓	Change livestock class -- do not exceed estimated AUM capacity.
✓	Adjust livestock grazing intensity and/or duration.
✓	Adjust livestock herding to manage specific areas of concern.
✓	Rest specified areas from livestock grazing.
✓	Restrict livestock grazing in specified areas (does not apply to recreation and outfitter/guide livestock under this analysis).
✓	Install barriers on trails to prevent livestock from cutting switchbacks on the trails.
✓	Use or exclusion of a pasture.
✓	Modify allotment infrastructure.
✓	Adjust pasture boundaries.
✓	Construct additional water developments.

### 2.3 Alternatives Considered but Eliminated from Detailed Study

Two additional action alternatives were considered, but not carried forward for analysis.

#### ***A. Continue Current Management***

This would continue livestock grazing with the current numbers (250 CYL) and season, but without adaptive management. This alternative was not carried forward for in-depth analysis, because without adaptive management, this alternative would not meet the purpose and need. Additionally, because the Proposed Action includes adaptive management, the current numbers and season would always remain an option under the Proposed Action.

#### ***B. Permittee Proposed Action***

The Permittee originally proposed an action alternative that was different from the Forest Service proposed action. Through collaboration with the Permittee, the Forest Service and Permittee Proposed Actions were merged together into a single proposed action. That proposed action is analyzed in this document as Alternative 2.

The two alternatives listed in sections 2.2.1 and 2.2.2 represent a range of reasonable alternatives carried forward for analysis. This is a range of reasonable alternatives because no other reasonable action alternatives were suggested during scoping by the Permittee or the public.



## 2.4 Summary Comparison of Alternatives Carried Forward for Analysis

The following table contains a qualitative assessment of how the No Action Alternative and the Proposed Action would respond to the key issues.

<b>Table 13: Summary Comparison of Alternatives in Response to Key Issues</b>		
<b>Key Issue</b>	<b>Alternative 1 No Action – Remove Livestock</b>	<b>Alternative 2† Proposed Action – Continue Grazing</b>
<b>Condition of Upland Vegetation And Rangeland</b>	Without foraging and trampling, plant communities would show improvement. Improvements would be expected within 1-2 years.	Would continue livestock grazing and incorporate adaptive management. Initially, grazing would be at lower authorized numbers and range improvements would result in better livestock distribution (Statement A)  Areas in decline would show improvement over the next 5-10 years.
<b>Soils</b>	Livestock would no longer contribute towards soil destabilization.  As plant communities improve, they would improve soil stability. Improvement would occur in 2-4 years.	Statement A  Areas in decline would show improvement over the next 5-10 years as plant communities improve.
<b>Economic Social and Cultural Values</b>	Would affect the local economy and likely result in the selling and subdividing of a private ranch. This would be a loss of part of the community's western heritage.  Assuming the loss of public land grazing results in the shut-down of the ranch, payments of property taxes and the selling of beef would no longer contribute to the local economy. Community open space and habitat would be reduced. If a subdivision is created, there would be an increased cost to community services.	Statement A  The private ranch would keep operating. This would preserve part of the community's western heritage. Payments of property taxes and the selling of beef would continue to contribute to the local economy. There would be no local job losses. Community open space and habitat would not be reduced. There would be no increased costs to community services.
<b>Merriam's Turkey</b>	Livestock would no longer consume vegetation the turkey could use for cover from predation while foraging, nesting and rearing. In addition, no incidental trampling of turkeys by livestock would occur.	Would continue livestock grazing on the Buckhorn Allotment with adaptive management. Although livestock would still be grazing, it would allow for vegetation improvements. The amount of cover available to turkeys would increase. Incidental trampling of turkeys by livestock would continue.

† Adaptive management would allow for adjustments in livestock numbers and seasons of use if monitoring shows an unacceptable level of impacts occurring.

<b>Table 14: Summary of How the No Action Alternative and Proposed Action Meet the Need Statements from Section 1.5.2†</b>														
<b>Alternative</b>	<b>Need 1</b>	<b>Need 2</b>	<b>Need 3</b>	<b>Need 4</b>	<b>Need 5</b>	<b>Need 6</b>	<b>Need 7</b>	<b>Need 8</b>	<b>Need 9</b>	<b>Need 10</b>	<b>Need 11</b>	<b>Need 12</b>	<b>Need 13</b>	<b>Need 14</b>
<b>No Action</b>	Meet	Meet	Not Meet	Not Meet	Not Meet	Not Meet	Not Meet	Meet	Meet	Meet	Meet	Meet	Meet	Not Meet
<b>Proposed Action</b>	Meet	Meet	Meet	Meet	Meet	Meet	Meet	Meet	Meet	Meet	Meet	Meet	Meet	Meet

† This is just a summary table. Specifics on how the needs are addressed is presented in narratives in Chapter 3.0.

Table 14 shows that the proposed action would meet all 14 need statements identified in Section 1.5.2. The no action alternative would not meet needs 3-7 and 14. This is because those needs involve the distribution of cattle, the treatments of weeds in the western half of Heifer Pasture, the repair and modification of fences, maintaining water in stock tanks for wildlife and conducting watershed restoration work in Wickiup Watershed.



The following table shows how the no action alternative and the proposed action would meet the objectives.

<b>Table 15: Summary Comparison of Alternatives in Response to Objectives</b>		
<b>Objective</b>	<b>Alternative 1 No Action</b>	<b>Alternative 2† Proposed Action</b>
<b>Develop a grazing management strategy that allows for the continuation of livestock grazing on the Buckhorn Allotment</b>	Would not meet objective because it would eliminate grazing which is contrary to the objective.	Would meet objective for the 10 year life of the TGP to ensure livestock grazing could continue as a use of the land while maintaining or improving resource conditions.
<b>Improve the health and vigor of upland plant communities</b>	Would meet objective because the removal of livestock would immediately improve the health and vigor of plant communities.	Would meet objective by adjusting livestock numbers and season to a level to allow the health and vigor of plant communities to improve. It is assumed that improvements would occur at a slower rate than under the No Action Alternative.
<b>Stabilize areas where past or current grazing practices have exacerbated active soil erosion.</b>	Would meet objective because the removal of livestock would immediately eliminate livestock caused soil erosion. Areas would begin to recover immediately.	Would meet objective by adjusting livestock numbers and season to levels that allow for the improvement of plant communities. As plant communities improve, their ability to hold and stabilize soil improves. Therefore, areas of active soil erosion would begin to recover. It is assumed that improvements would occur at a slower rate than under the No Action Alternative.

† Adaptive Management would be used to make adjustments any time monitoring shows the objective is not being met or that progress towards the objective is not being made.

Table 15 shows that the no action alternative would meet two of the three objectives, while the proposed action would meet all three of the objectives. Although the proposed action would meet the objectives, it is assumed that improvements on the land would take longer than under the no action alternative.

## 2.5 Project Design Criteria/Best Management Practices, Mitigations and Monitoring

Various measures are used to reduce or prevent undesirable effects to during the implementation of management activities. Identification of these measures begins in the planning and design phase of a project, and they become part of the proposed action. Forest Plan standards and guidelines are the first measures to be applied. Other project design criteria are then developed as needed. For this proposed action, various design criteria have been identified; they are listed in Appendix 2.

Some measures are not identified as design criteria because they are responses to events that won't necessarily occur and therefore might not be implemented. Instead of design criteria, these items are identified as mitigation measures. They are designed to respond to or "mitigate" something that may or may not happen. These are also listed in Appendix 2.



The interdisciplinary team has identified specific monitoring in connection with the Buckhorn EA Project. These monitoring requirements are listed in Appendix 2. If the proposed action is approved, these monitoring requirements would also be addressed in the Buckhorn AMP and AOIs.

Adjustments to the permitted livestock numbers and/or season of use would be implemented after consultation and coordination with the Permittee. Unless something requires immediate attention, modifications to the TGP would be implemented the grazing season after the consultation and coordination. The expectation is that annual monitoring would be incorporated into the AOIs, and grazing management would be modified in response to monitoring data. Allowable forage use standards, key areas to be monitored, wildlife management measures, invasive species or noxious weed management, plus any new proposed or alternations to existing range improvements would also be addressed in the AMP and the AOIs.



## 3.0 Affected Environment and Environmental Consequences

### 3.1 Introduction

This chapter describes the present conditions of the environment in Buckhorn Allotment, and the reasonably foreseeable effects from implementing the no action alternative and the proposed action. This chapter provides the analytical basis to compare the alternatives.

This chapter begins by describing the resources that have been selected for analysis. These resources were selected based on the results of internal discussions between resource specialists, the Responsible Official, the permittee, and an evaluation of all public scoping responses. The resources related to the key issues: Upland Vegetation, Rangeland Resources, Soils, Economics and Social/Cultural Values, and Wildlife are discussed in the greatest detail. Issues related to general issues are discussed only briefly. Resources that were determined to not be affected are not discussed at all in this EA, such as minerals and wilderness. A summary of the affected and non-affected resources is presented in the following table.

<b>Table 16: Affected Resources – Summary Table†</b>					
<b>Resources and Management Elements</b>	<b>Potentially Affected</b>		<b>Resources and Management Elements</b>	<b>Potentially Affected</b>	
	<b>Yes</b>	<b>No</b>		<b>Yes</b>	<b>No</b>
Air Quality		X	Paleontology		X
Cultural Resources and/or Native American Religious Concerns	X		Hydrology/Water rights	X	
Areas of Critical Environmental Concern		X	Geology and Minerals		X
Threatened, Endangered, and Sensitive Species (TE&S)	X		Soils	X	
Migratory Birds	X		Wildlife, Aquatic and/or Terrestrial	X	
Wastes, Hazardous or Solid/ Health and Safety		X	Range Management	X	
Water Quality (Surface and Ground)	X		Recreation	X	
Invasive Non-native Species/Vegetation	X		Visual Resources	X	
Prime and Unique Farmlands		X	Noise		X
Floodplains and/or Wetlands	X		Socioeconomic Values	X	
Wild and Scenic Rivers		X	Lands and Rights-of-way		X
Wilderness	X		Law Enforcement		X
Environmental Justice	X		Forest Management		X
Timber		X	Fire and/or Fuels Management		X

† This list of affected resources was approved by the Responsible Official.

Several judgmental terms appear in the following sections. Unless otherwise specified, here is what they mean:

- Short-term effects: Effects that typically last less than five years
- Long-term effects: Effects that typically last longer than five years
- Adverse Effects: Effects that are generally considered to not contribute towards the health of a resource.
- Beneficial effect: Effects that generally contribute towards the health of a resource



The Proposed Action would not be a new use of the land; it would continue an activity that has occurred for over 100 years.

Although about 11,000 acres of the allotment does fall within an inventoried roadless area, there is nothing in the proposed action or no action alternative that would have any effect on inventoried roadless areas. No roads are proposed for construction, closure or decommissioning as part of the proposed action. Therefore, inventoried roadless areas are not discussed further in this analysis.

### 3.2 Alternatives and Their Response to Key Issues

This section summarizes how each alternative responds to each key issue. Key issues were identified in Chapter 1.0, and the Alternatives were described in Chapter 2.0.

#### 3.2.1 Alternative 1 – No Action/No Grazing

Table 17 shows how no action/no grazing would respond to the Key Issues

<b>Table 17: No Action/No Grazing - Response to the Key Issues</b>		
<b>Key Issue</b>	<b>Indicator(s)</b>	<b>Effect of Alternative 1</b>
Condition of Upland Vegetation and rangeland	Stubble height	With the removal of cattle, vegetation would not be subject to cattle grazing, and stubble height increases would be noticed quickly (1-3 years)
Condition of Soils (bare and eroding)	Amount of bare soil	With the removal of cattle, vegetation would be able to reestablish itself on areas of bare soil. Recovery would be evident within 1-3 years.
Economic, Cultural and Social Values	Presence and operation of the private ranch	With the loss of public land grazing, there is an increased possibility the ranch might shut down and be sold.
Wildlife - Turkey	Increased diversity of grass (3-5 types) and forbs (4-8 types)	Would lead to increased diversity of grass and forbs for turkey habitat.

#### 3.2.2 Alternative 2 – Proposed Action

Table 18 shows how the proposed action would respond to the key issues.

<b>Table 18: Proposed Action - Response to the Key Issues</b>		
<b>Key Issue</b>	<b>Indicator(s)</b>	<b>Effect of Alternative 2</b>
Condition of Upland Vegetation and Rangeland	Stubble height	Grazing would continue. Adaptive management would allow us to make adjustments to move towards desired conditions. Improvements would occur, but would likely take 5-10 years.
Condition of Soils bare and eroding	Amount of bare soil	Grazing would continue. Adaptive management would allow us to make adjustments to move towards desired conditions. Improvements would occur, but would likely take 5-10 years. Any restoration work in the Wickiup Watershed would result in immediate improvements.
Economic, Cultural and Social Values	Presence and operation of the private ranch	The ranch would be able to sustain operations. It would continue its contributions to the local economy and provide habitat and open space benefits. Coconino and Yavapai Counties would be able to maintain part of its western heritage.
Wildlife - Turkey	Increased diversity of grass (3-5 types) and forbs (4-8 types)	Would lead to increased diversity of grass and forbs for turkey habitat. However, it is assumed that with grazing, this diversity would take longer to achieve than under the No Action Alternative.



### 3.3 Affected Resources

The resources that were analyzed for potential effects from the proposed action and no action alternative are summarized below:

- Rangeland Resources
- Upland Vegetation
- Soils
- Economic and Social/Cultural Values
- Wildlife
- Riparian Areas and Water Quality
- Visuals
- Weeds
- Cultural Resources
- Fisheries
- Recreation
- Wilderness

The scope of the evaluation for the direct and indirect resources is limited to Buckhorn Allotment, as shown on Map 1 in Appendix 1.

Each resource includes a discussion on how the proposed action might result in effects that combine with the effects of other projects for a cumulative effect contribution. In general, the past and reasonably foreseeable actions are the same for every resource discussion. The past, present, and reasonably foreseeable future activities considered in the cumulative effects analysis include: dispersed recreation, firewood gathering, watershed and wildlife habitat improvements, hunting, road maintenance, off-highway vehicle (OHV) use, wildlife grazing, wildfire and prescribed fire, and weed treatments. Appendix 3 can be referenced for a detailed catalog of past, present and reasonably foreseeable projects used in the evaluation of the cumulative effect contributions.

Except where otherwise indicated, the geographical extent of the cumulative effects analysis is confined to the Walker Basin Allotment. The timeframe selected for this analysis is 20 years; 10 years in the past and 10 years in the future. This timeframe was selected because 10 years is one planning cycle, and ground-disturbing activities generally recover and stop contributing effects within 10 years.

OHV use has increased over the last several years. A travel management analysis for the entire Coconino National Forest is in progress to address travel management issues, including miles of roads and off-road vehicle travel. Therefore, travel management is not discussed in this analysis.



### **3.3.1 Rangeland Resources**

This section describes the condition of the allotment based on established Forest Service Region 3 protocols for evaluating rangeland health for the purposes of livestock grazing.

#### **3.3.1.1 Affected Environment**

The allotment contains 20 pastures and 7 waterlots (refer to map 2). The winter section of the allotment contains 12 pastures. Elevations range from 3,800 feet in the Winter Pasture to 6,600 feet at Buckhorn Mountain in Buckhorn Pasture. The typical vegetation below 4,500 feet is desert scrub. From 4,500-5,500 feet, the vegetation turns into pinyon-juniper; above 5,500 feet is ponderosa pine. The summer portion of the allotment contains 8 pastures. Elevations range from 5,800 feet in Oak Pasture to approximately 6,900 feet on the east end of the allotment. The summer portion is dominated by ponderosa pine and gambel oak. The vegetation on the allotment is typical for the area; special status vegetation is described in section 3.6.

Various range improvements, including fences, cattleguards, and drinkers are found throughout the allotment.

The current condition of the allotment was described in Section 1.8, and is not repeated here.

#### **3.3.1.2 Environmental Consequences - Direct, Indirect and Cumulative Effects**

##### **A. Alternative 1 – No Action/No Grazing - Direct and Indirect Effects**

Livestock grazing would not occur. There would be no effects from livestock grazing on upland vegetation. Wildlife would continue to graze on the allotment, creating localized impacts and potentially areas of excessive utilization.

Short-term changes in range condition and trend (as measured by changes in vegetation density and diversity) would be observed under this alternative. The degree to which those changes would occur is uncertain. Scientific studies report a wide range of outcomes from the absence of livestock grazing. **Courtois, et al (2004)** found few differences in species composition, cover, density, and production in comparing 16 long-term (65 years) livestock exclosures, with adjacent areas that had been moderately grazed. **Baxter (1977)**, however, reported greater diversity and less bare ground in a non-grazed area, when compared to continuously grazed, and rest-rotation grazed sites in North-central Arizona.

In considering these two studies, combined with our local knowledge of the allotment and conditions, range condition and trend would remain static (depending on climate and/or wildlife) or move upward, simply because the livestock would not be present to consume forage. Although we can assume the removal of livestock means less grazing, it does not guarantee improvement. Any improvements in range condition and trend would be heavily dependent on favorable climate and the amount of use the allotment receives from wildlife.



Cool-season species would continue to receive a disproportionate share of the grazing, although it would be by wildlife (deer, elk) only. If wildlife numbers across the landscape fluctuate (which could be the result of weather and/or AGFD hunt numbers), this would affect range vegetation. Although specific numbers could not be determined, it is accurate to say that in general, the lower the wildlife numbers, the greater the chance is for plants to recover from grazing effects. If, in the absence of livestock, wildlife numbers got high enough, the plants would be continually grazed, and there would be a loss in plant species diversity (**Archer and Smeins 1991; Briske D.D. 1991; Szaro, et al 1999; Vavra, et al 1994**).

Forage production and quality would experience a short-term increase (1-3 years), followed by a period of stabilization and then decline (after 5 years). **Holechek (1981)** reported that forage production and quality is maintained and enhanced by light to moderate grazing. Light to moderate grazing by wildlife would maintain a mosaic of forage production and quality.

New structural range improvements would not be constructed. Existing improvements would not be maintained or removed. There would be a loss of water available for wildlife since livestock water sources would not be maintained. Stock tanks would dry up and fill with sediment. Without removal or maintenance, the water systems would eventually fail and degrade into ruins.

#### **B. Alternative 1 – No Action/No Grazing - Cumulative Effects**

Since no livestock grazing would occur under this alternative, there would be no grazing of vegetation by domestic livestock. Wildlife grazing would still occur in combination with other uses. As described above, this would allow for more plant growth. Other changes in road management and OHV use through the Travel Management Plan would also allow for increased plant growth and less fragmentation of vegetation. Habitat improvement projects such as prescribed burning would continue, allowing for increased plant growth. Therefore, this alternative would contribute towards a cumulative effect (increased plant growth) to upland vegetation across Buckhorn Allotment.

#### **C. Alternative 2 – Proposed Action –Direct and Indirect Effects**

Under this alternative, livestock grazing would continue. The effects from grazing (forage consumption) would continue. However, adaptive management and monitoring would be used to evaluate the effects and make changes as necessary to maintain or move towards desired conditions. Wildlife would continue to graze on the allotment.

Through consumption, livestock affect vegetation through a reduction in plant height and cover. Under unfavorable climate conditions (drought), this would lead to a decrease in: plant diversity, canopy cover, abundance, production, and ground cover. Such impacts to plant health can be reduced in several ways, such as through proper application and monitoring of forage utilization and grazing intensity guidelines. Favorable climate is critical for maintaining adequate plant health.



Adaptive management and monitoring would provide flexibility to adjust the management of the Permittee's herd to maintain or improve vegetative conditions. The proposed guidelines would maintain forage on the allotment to: reproduce; grow to maturity; build necessary root mass; produce seed heads; produce litter important for nutrient cycling; and propagate and move into new areas. In Galt, et al. (2000), a 25 percent utilization guideline was recommended for livestock, with 25 percent allocated for wildlife and natural disturbance, and the remaining 50 percent left for site protection. Under the proposed action, wildlife use is included within the proposed forage utilization guideline of 30 to 50 percent. As a result, this alternative leaves 50-70 percent of the forage production available at the end of the growing season for site protection.

The timing of grazing affects plant species composition. For example, spring and early summer grazing occurs mainly on cool season species. After the monsoon season, grazing occurs mainly on warm season species. As the weather cools in the fall, use changes back to cool season species. Under this alternative, the grazing use period within a pasture would be seasonally rotated so that forage is grazed and rested at different times each year. Holechek (1981) reported that forage production and quality is maintained and enhanced by light to moderate grazing. By alternating the livestock use and rest periods on cool and warm season species, forage production, forage quality, and plant species composition would be maintained or improved. Additionally, adaptive management and monitoring would provide the necessary resource information and management options to adjust the timing, intensity, frequency, and duration of livestock grazing to ensure that vegetation condition is maintained or improved.

Under this alternative, like under the no action alternative, upland vegetation condition and trend is expected to remain static or move upward. However, under this alternative, it would be due to more control over cattle numbers and water development and fencing improvements that would lead to better cattle distribution. It is assumed that the improvements under this alternative would take longer than under the no action alternative, simply because the livestock would still be grazing. There would be no measurable effects to upland vegetation resulting from the construction of structural improvements (fences, drinkers).

#### **D. Alternative 2 – Proposed Action – Cumulative Effects**

The geographical extent, timeframe, and past, present, and reasonably foreseeable future activities are the same as described in the no action alternative.

Livestock grazing would affect understory plants by reducing plant height and canopy cover. However, with adaptive management, condition and trend for upland vegetation is expected to remain static or move upward with cattle grazing. Therefore, the cumulative contribution of this alternative would be the same as described for the no action alternative. However, it is assumed that with livestock grazing, the upward trends would occur more slowly.

##### **3.3.1.3 Design Criteria and Monitoring**

Various resource protection measures would be used under the proposed action. These include monitoring the Permittee's compliance with the TGP, AMP, and AOIs. Grazing impacted areas



would be monitored, and salt would be used to improve livestock distribution. A detailed list of design criteria and monitoring that would be completed under the Proposed Action is in Appendix 2.

#### 3.3.1.4 Conclusion Summary

Under both alternatives range condition and trend would either be static or move upwards. It is too speculative to try and assign a rate of improvement to each alternative, but it can be reasonably assumed that any upward trends would occur faster under the no action alternative.

### 3.3.2 Upland Vegetation – Special Status Species

This section focuses on potential effects to special status plants, either threatened, endangered, candidate or sensitive species and habitat. Riparian vegetation is not discussed here; it is discussed in section 3.9.

Pages 138-146 of the noxious and invasive weeds FEIS addresses the effects of herbicides on threatened, endangered, candidate and sensitive species of plants. The conclusion was that the use of herbicides would reduce weed infestations in the habitats for special status species, allowing them greater potential to maintain and expand their populations. Therefore the effect of triclopyr on vegetation is not discussed further.

#### 3.3.2.1 Affected Environment

No threatened, endangered, or candidate species are known to occur in Buckhorn Allotment. Habitat in Buckhorn Allotment is capable of supporting nine Forest Service Region 3 sensitive plant species. There is potential habitat for all nine species, but only one species is known to occur in the allotment. The eight that do not occur are listed in the table below, but are not discussed in further detail because, as described in section 3.3.1, both alternatives would contribute towards habitat improvements. The eight species with potential habitat may establish themselves in Buckhorn Allotment under both alternatives, but that is not a component of the proposed action. All nine species are listed in Table 19.

<b>Table 19: US Forest Service Region 3 Sensitive Species With Potential to Occur on Buckhorn Allotment</b>	
<b>Species</b>	<b>Evaluation</b>
Tonto Basin Agave	There are no known occurrences within the allotment, so there would be no effects to this species. The potential habitat is generally around archaeological sites.
Heathleaf Wild Buckwheat	There are no known occurrences within the allotment, so there would be no effects to this species. The potential habitat is limited to special soils within Heifer, Winter and Wickiup Pastures.
Ripley Wild Buckwheat	Same as Heathleaf Wild Buckwheat
Hualapi Milkwort	There are no known occurrences within the allotment, so there would be no effects to this species.
Verde Valley Sage	Same as Heathleaf Wild Buckwheat



Cliff Fleabane	There are no known occurrences within the allotment, so there would be no effects to this species. The sheer canyon walls are the potential habitat; livestock cannot access the canyon walls.
Arizona Sneezeweed	There are five known occurrences of this plant within the allotment.
Eastwood Alum Root	There are no known occurrences within the allotment, so there would be no effects to this species. Canyons in ponderosa pine forests are the potential habitat. It grows on moist slopes or cliffs, which would be generally inaccessible by livestock.
Flagstaff Beardtongue	There are no known occurrences within the allotment, so there would be no effects to this species. Potential habitat includes dry pine forests, pine/oak, pine/oak/juniper and pinyon-juniper forests. This species has been found on the neighboring Mogollon Rim Ranger District.

Livestock grazing has occurred on this allotment for more than 100 years. It is assumed that incidental grazing of sensitive plants by livestock and wildlife does occur.

Page 142 of the noxious and invasive weeds FEIS discusses the potential effect to Arizona sneezeweed from herbicides. This potential effect is eliminated through the careful application to only the weeds, and therefore it is not discussed further. Weed treatments under the proposed action would be done by hand.

### **3.3.2.2 Environmental Consequences**

#### **A. Alternative 1 – No Action/No Grazing – Direct and Indirect Effects**

Livestock would be removed from the allotment. It is assumed that without livestock grazing, there would be an increase in the potential for sensitive species to establish themselves or increase their abundance within the allotment. Additionally, it is assumed that without livestock grazing, there is less potential for incidental grazing of sensitive plants. However, grazing by wildlife would continue under this alternative, so any incidental grazing of sensitive plants would not stop.

The restoration work proposed for the western half of Heifer pasture would not occur. Therefore, potential habitat for heathleaf wild buckwheat, Ripley's wild buckwheat, Verde Valley sage and Hualapai milkwort would not be restored.

#### **B. Alternative 1 – No Action/No Grazing – Cumulative Effects**

Livestock would no longer graze on the allotment, so incidental grazing of sensitive plants or compaction of soils by livestock would not occur. It is assumed that by eliminating livestock grazing, there would be a better chance for sensitive species to expand. Presently, the incidental grazing of sensitive plants by livestock has no measureable effect, so the elimination of this incidental grazing would have no measurable effect. Therefore, the effects of this action would not combine with the effects of any other past, present or reasonably foreseeable future actions to contribute towards a cumulative effect on special status plants.

#### **C. Alternative 2 – Proposed Action – Direct and Indirect Effects**

Potential habitat for heathleaf wild buckwheat, and Ripley's wild buckwheat, Verde Valley sage and Hualapai milkwort exists in the Heifer, Winter and Wickiup Pastures.



The western half of Heifer Pasture, where most of the potential habitat is located, would be deferred. This would remove potential livestock impacts (grazing, trampling) from that area. Livestock grazing would continue in the eastern half of Heifer Pasture, but water and fencing improvements would improve livestock distribution and result in a lower level of grazing than currently occurs. Any effects to potential habitat from livestock grazing would decline.

There would be effects to Arizona sneezeweed, which is found in the Clover, Willow and Brushy pastures. Only livestock grazing would occur in these pastures; no structural improvements are proposed. Therefore, Arizona sneezeweed would continue to be affected from incidental grazing and trampling by livestock and wildlife. No threats or measurable effects to Arizona sneezeweed have been identified, so continuing livestock grazing would not affect the population.

This proposed action includes adaptive management for improving conditions to meet the desired future condition for headwater meadows. This would improve potential Arizona sneezeweed habitat. In addition, the restoration work proposed for Heifer pasture would be completed. Therefore, potential habitat for heathleaf wild buckwheat, Ripley's wild buckwheat, Verde Valley sage and Hualapai milkwort would be restored, with a fence that excludes livestock.

#### **D. Alternative 2 – Proposed Action – Cumulative Effects**

Grazing would continue under an adaptive management strategy. This course of action is expected to improve range conditions, which would improve habitat for the Arizona sneezeweed and improve potential habitat for other species. The cumulative effects contribution would be the same as under the No Action Alternative, with one difference. Under this alternative, specific improvements would be made on the allotment to improve habitat. Therefore, this alternative would combine with other habitat restoration projects (prescribed burning, weed treatments) and contribute towards a cumulative effect.

##### **3.3.2.3 Design Criteria and Monitoring**

No specific design criteria or monitoring were developed for special status plants under the proposed action.

##### **3.3.2.4 Conclusion Summary**

Neither alternative would result in a measurable effect towards special status plants. There would be habitat improvements for sensitive species under both alternatives, but the proposed action includes a specific restoration project in Heifer Pasture that would not be completed under the no action alternative.

### **3.3.3 Soils**

This section describes the current condition of the soil in the allotment and the potential effects of each alternative on the soil. This section does not describe individual soil types, but rather focuses on the condition of the soil.



Grazing affects soil by the livestock consuming forage and reducing the vegetative cover over the soil. This results in:

- Compaction of soils from hoof action, resulting in reduced water infiltration into the soil.
- Exposing the soil to raindrop impacts and overland flows of water, leading to soil crusting, increased erosion, and a general loss of stability.
- The reduced cover also results in a loss of soil organic matter, which leads to a loss of soil microbes that recycle nutrients.

### 3.3.3.1 Affected Environment

There are 20 pastures in the allotment. The pastures are located in six vegetation types. Each vegetation type has its own soil characteristics, as described in Table 20.

<b>Vegetation Type</b>	<b>Typical Soil Condition</b>
Ponderosa Pine Forest	These soils are dominated by basalt and limestone. They have a thin (<7 inches) layer of organic matter on the surface, have medium to clayey textures, and range from deep (>40 inches) to shallow (<20 inches) to bedrock.  Pastures in the ponderosa pine have mostly satisfactory soil conditions and offer full capability for grazing. Grazing can occur without posing risk to long-term soil productivity.
Montane meadows within ponderosa pine	These soils have thick (8-16 inches) layers of organic material on the surface. They are capable of supporting large amounts of vegetation.  Pastures in the montane meadows have variable soil conditions from impaired to unsatisfactory and offer potential capability. Evidence of high elk utilization and soil trampling are common throughout these pastures. Soil conditions are not likely to improve under any kind of grazing system, given the extent of elk disturbance.
Pinyon-juniper woodlands	These soils are dominated by basalt, and are fine-textured (clayey). They have thin (<7 inches) layers of organic material on the surface. There are some areas of thicker organic material where they transition into alligator juniper woodlands.  The majority of the pastures located in this vegetation type are impaired and offer potential grazing capability under a conservative allowable use and adaptive management strategy
Juniper/semi-desert grassland transitions	These soils are dominated by basalt, cinder, and limestone. They are usually deep (>40 inches to bedrock) with fine (clayey) textures and some medium textures.  The majority of the pastures located in this vegetation type are impaired and offer potential grazing capability under a conservative allowable use and adaptive management strategy
Semi-desert Grassland/Shrub	These soils are mostly calcareous and medium textured. The organic layer is thin and they are usually shallow to bedrock (<20 inches)
Desert	These soils are mostly calcareous and medium textured. The organic layer is very thin and they are usually deep (>40 inches) to bedrock.



Across the allotment, soils were classified according to their ability to support grazing. They were classified as follows:

<b>Table 21: Classification of Soils on Buckhorn Allotment*</b>		
<b>Condition</b>	<b>Acres</b>	<b>Percentage of Allotment</b>
Satisfactory	13,806	40%
Impaired	13,878†	40%
Unsatisfactory	1,111	3%
Inherently Unstable	6,147	17%

\* See pages 36-44 of the Soil and Water Specialist's Resource Report for details on how the classifications were made

† Montane meadows account for about 160 acres of the impaired soils listed above

Satisfactory soils mostly occur in the ponderosa pine type because the needle cast protects the soil from compaction and erosion. These soils are fully capable of supporting livestock grazing while maintaining soil productivity.

Impaired soils generally occur in pinyon-juniper woodlands, chained areas, and some juniper-semi-desert grassland transitional areas and semi-desert grassland/shrubs. These soils have reduced species composition, less diversity of plants and litter cover, and show signs of accelerated erosion. These soils are capable of supporting conservative use livestock grazing while maintaining soil productivity.

Unsatisfactory soils generally occur on flat slopes (less than 10 percent slope), in deserts, and in some pinyon-juniper semi-desert grassland transitions. They sometimes have signs of compaction, rilling, and gulying. The amount of forage on these areas is low, and they offer no potential for livestock grazing. Livestock tend to only congregate on these flat slopes when stock tanks are placed on them. This reduces vegetation even further and contributes to more erosion and compaction.

Inherently unstable soils have high natural erosion rates, but are functioning properly and normally. Due to their erosion rates, they cannot support grazing. They tend to occur on steep slopes (>40% slope). Due to the slope, livestock generally avoid these areas without the need for fences.

Montane meadow systems have potential capability for livestock grazing. However, the montane meadows in the allotment are all either unsatisfactory or impaired and therefore currently are not capable of supporting grazing. They have compacted soils, evidence of sheet erosion, and reduced nutrient cycling. These meadows have been strongly influenced by elk grazing, which is outside Forest Service control. Even if we proposed a livestock fence to keep the cows out of the meadows, it would not make a difference because of the elk grazing. The only way to exclude the elk would be with a 9 foot high wildlife enclosure, which is cost prohibitive at this time.



Six of the 20 pastures in Buckhorn Allotment are of particular concern. These are:

<b>Table 22: Soils of Particular Concern in Pastures on Buckhorn Allotment</b>	
<b>Pasture</b>	<b>Soil Notes</b>
<b>Heifer</b>	<p>The pasture is located in a juniper/semi-desert grassland transition zone</p> <p>Has the greatest percentage of unsatisfactory soils – 25% of the pasture, or 378 acres. Unsatisfactory soils combined with inherently unstable soils accounts for 47% of the pasture.</p> <p>Unsatisfactory soils do not offer much forage, generally less than 100 lbs/acre. The west half of the pasture is mostly unsatisfactory, and the east half is mostly impaired. The east half could be grazed under a conservative use using adaptive management, if a fence is constructed to keep them out of the west half.</p> <p>Permitting grazing under current conditions would not allow recovery towards desired conditions.</p> <p><b>This pasture would be able to support grazing if soil conditions improve.</b></p>
<b>Oak</b>	<p>39% of this pasture (832 acres) had satisfactory soil conditions, 60% of the pasture (1282 acres) had impaired conditions, and 1% (11 acres) has inherently unstable soils.</p> <p><b>Under the proposed action, with all BMPs and adaptive management, this pasture could be grazed</b></p>
<b>Cedar</b>	<p>65% of this pasture is impaired, and 8% is unsatisfactory. Permitting grazing under current conditions would not allow recovery towards desired conditions.</p> <p><b>This pasture would be able to support grazing if soil conditions improve.</b></p>
<b>Winter</b>	<p>Only 1% of this pasture (39 acres) is in satisfactory condition. About 10% of the pasture (342 acres) is in unsatisfactory condition, about 40% of the pasture (1,411 acres) contains inherently unstable soils, and 49% (1,727 acres) is in impaired condition.</p> <p><b>This pasture could be grazed at a conservative use, provided all BMPs and adaptive management strategies are used.</b></p>
<b>Clear Creek</b>	<p>Currently is NOT GRAZED. Contains 2.7 miles of West Clear Creek, which is in Properly Functioning Condition.</p> <p>About 20% of the pasture (400 acres) could support grazing. A developed recreation site is located in this pasture and presents the potential for user conflicts. Nearby recreation already contributes to overall riparian degradation.</p> <p><b>This pasture could support some grazing, if grazing was deferred on 1491 acres that border West Clear Creek and the developed recreation site, leaving 652 acres for grazing.</b></p>
<b>Bull Pen</b>	<p>Located downstream of Clear Creek Pasture, containing one mile of West Clear Creek. The only areas of capable rangeland with satisfactory or impaired soils are located on the west side of Clear Creek. This accounts for 55% of the pasture (231 acres). The remainder of the pasture contains steep, inherently unstable soils, 54% (282 acres) and 2 acres of unsatisfactory soils.</p> <p><b>138 acres of satisfactory soil can be grazed, and are in an area that is proposed to be fenced off from West Clear Creek to prevent livestock from entering the riparian corridor.</b></p>



To see a complete breakdown of soils by pasture, refer to Table 7 on page 39 of the soil and water specialist's report. Other pastures are not specifically discussed in this EA. If the proposed action is capable of moving the most critical areas towards the desired conditions, it can be assumed with a reasonable degree of certainty that the less critical areas would also move towards desired conditions.

Page 26 of the BAWIP EA discusses effects to soil from triclopyr. Triclopyr breaks down within 30 days and does not affect soil function. Therefore, effects to soil from triclopyr are not discussed further.

### **3.3.3.2 Environmental Consequences – Direct, Indirect and Cumulative Effects**

#### **A. Alternative 1 – No Action/No Grazing - Direct and Indirect Effects**

Under this alternative, no livestock grazing would occur on Buckhorn Allotment. By removing livestock, the standing crop of forage would increase and compaction of soils would no longer occur from livestock grazing. Vegetative composition, diversity and ground cover would improve, and upland utilization standards would be met. Areas with unsatisfactory soils would improve at a slower rate than those with impaired soils, but it is too speculative to try and predict rates of improvement. Management techniques would be used to deter livestock from using the montane meadows, such as strategic placement of salt licks.

Soil organic matter would begin to accumulate in areas that have been depleted and compacted; soils would return to their normal densities. Soil structure and the ability of the soil to infiltrate water would improve. The soil would stabilize and maintain productivity under this alternative.

It is difficult to say over what period of time these improvements would be evident. Some, like the increase in the standing crop of forage would probably be evident in 1-2 years. However, most of the improvements would depend on the timing and amount of precipitation. If drought conditions persist, improvements would take longer. However, it can be stated with reasonable certainty that the improvements would occur faster under the no action alternative than they would under the proposed action.

#### **B. Alternative 1 – No Action/No Grazing - Cumulative Effects**

Upland utilization standards would be met. Weed treatments and prescribed burns have occurred and would continue to occur in the allotment to improve upland vegetation. Therefore, effects from this project would combine with those projects and contribute towards a cumulative effect.

#### **C. Alternative 2 – Proposed Action – Direct and Indirect Effects**

Livestock grazing would continue. Hoof action by cattle would continue to compact soils, reducing their ability to infiltrate water and support vegetation. Soil compaction would be expected to occur where the cattle congregate, primarily around water sources. Water sources represent a small portion of each pasture, since drinkers and stock ponds usually do not occupy more than an acre. Some research by Savory and Parsons (1980) and Savory (1988) has shown that in areas where livestock do not congregate (the majority of the allotment), the hoof action



actually reduces compaction by breaking up the surface of the soil and mixing in organic material, which prepares the site for seed growth.

Livestock would continue to consume vegetation, which does result in a reduction of cover. However, this alternative would use adaptive management to control stocking rates more closely and allow the Forest Service to respond to any concerns. Since the proposed action would continue grazing under a rotational management system with adaptive management and defer parts of Clear Creek, Bull Pen and Heifer Pastures, and conduct weed treatments in the deferred part of Heifer Pasture, it would allow for plant growth and soil recovery. Therefore, the effects from the proposed action would be the same as those described for the no action alternative. However, improvements under this alternative would be expected to take longer because livestock would still be grazing on the allotment.

Table 23 shows how the proposed action would affect the six allotments of concern.

<b>Table 23: Effect of the Proposed Action on Soils of Concern in Pastures of Buckhorn Allotment</b>	
<b>Pasture</b>	<b>Effect of the Proposed Action</b>
<b>Heifer</b>	Some areas away from water sources in Heifer Pasture had compacted soils. This occurred where a lot of bare soil is present. The compaction primarily occurs from animals (cattle and wildlife). Since the proposed action would remove the west side of Heifer Pasture from grazing, which is in mostly unsatisfactory condition, cattle impacts would be eliminated from these areas and the soil condition would be improve. The east half of the pasture is mostly impaired and can be grazed under the proposed action while allowing for improvement. Under the proposed action, the compacted soils in the east half would improve as vegetative cover improves.
<b>Oak</b>	Under the proposed action grazing would continue under a conservative, adaptive management strategy. The impaired soils in this pasture would move towards desired conditions.
<b>Cedar</b>	Under the proposed action grazing would continue under a conservative, adaptive management strategy. The impaired soils in this pasture would move towards desired conditions.
<b>Winter</b>	Due to the steep slopes and difficult access due to high rock content, the inherently unstable soils would not be extensively or intensively grazed.
<b>Clear Creek</b>	A riparian ecosystem is located in this pasture. Therefore, under the proposed action grazing would be deferred on 1491 acres that border West Clear Creek and a developed recreation site, leaving 652 acres for grazing.  Some areas away from water sources on the west side of Clear Creek Pasture had compacted soils. This occurred where a lot of bare soil is present. The compaction occurs primarily from animals (cattle and wildlife). Since the Proposed Action would remove the west side of Clear Creek Pasture from grazing, cattle impacts would be eliminated from these areas and the soil condition would be expected to improve.
<b>Bull Pen</b>	138 acres of satisfactory soil can be grazed. Under the proposed action these acres would be fenced off from West Clear Creek to prevent livestock from entering the West Clear Creek riparian corridor. Livestock would continue grazing the 138 acres, and it would be maintained in satisfactory condition.



In addition, some restoration work may occur in the Wickiup Watershed (see Section 2.2.2 A9). This would immediately stabilize some soils, thereby reducing erosion and sedimentation.

#### **D. Alternative 2 – Proposed Action – Cumulative Effects**

The area selected for the cumulative effects evaluation is the West Clear Creek watershed and the Lower Wet Beaver watershed (Appendix 1, Map 5).

Past actions in the allotment that have affected soil include livestock grazing, thinning, burning, wildfires, road construction, recreation, and off-highway vehicle use. Other factors that have affected the allotment include periods of drought and cyclical climate changes. At the start of the 20<sup>th</sup> century, livestock numbers were much higher than they are now, and grazing was largely unregulated. Unregulated grazing is how the historical livestock impacts came about. Impacts to public land from recreational OHV use are a serious concern and are being addressed in a separate travel management analysis.

If the proposed action is selected, livestock grazing would continue into the future, as would thinning, burning, wood collection, wildfires, road maintenance, recreation, special uses, and OHV use. It is expected that when travel management is implemented, erosion and sedimentation problems from OHV use would be reduced.

The proposed action would provide for soil recovery and stability. This effect would combine with the reasonably foreseeable effect of implementing travel management for a cumulative effects contribution towards stabilizing soils in the allotment.

#### **E. Design Criteria and Monitoring**

Various resource protection measures would be used under the proposed action. The measures are the same as described for range, such as monitoring the Permittee's compliance with the AMP each year. Monitoring would be done in accordance with the Region 3 FSH Supplement 2509.18-99-1. A detailed list of design criteria and monitoring that would be completed under the Proposed Action is in Appendix 2.

#### **F. Conclusion Summary**

Under each alternative, the amount of bare soil and compacted soil in the allotment would be reduced. Unsatisfactory soils would make progress towards becoming satisfactory soils and impaired soils would make progress towards becoming satisfactory soils under both alternatives. The difference is that improvements would occur more slowly under the proposed action than under the no action alternative, with the possible exception of the Wickiup Watershed. Restoration work in the Wickiup Watershed would result in immediate improvements that would not be seen under the No Action Alternative. However, placing an actual rate of improvement is too speculative, since climate conditions are so variable.



### 3.3.4 Economic, Social and Cultural Values

This section describes how the alternatives would affect the economic wellbeing of the Permittee, and the potential social, economic, and cultural effects to Coconino and Yavapai Counties. Therefore, this evaluation is presented, in both an individual permittee context, and a larger community-scale context. This section also briefly discusses Environmental Justice.

The economic analysis does not consider the Permittee's private personal financial information (profit margin, real estate, debt, etc.) in regards to sustaining operations. The economic analysis was conducted under the assumption that ranch sustainability is dependent upon a profit margin. It is generally known that profit margins in small-scale ranching operations such as this one are extremely slim.

Although some quantitative data is presented in this section, the majority of the social and cultural analysis was done from a qualitative perspective. This is because many of the values associated with western ranching, such as cultural lifestyle, community heritage, and aesthetics, cannot be assigned a numerical value for evaluation.

A paper titled "The Economic Importance of Livestock Grazing on BLM Land in Fremont County Wyoming" (Wyoming Paper) was used for this evaluation. Because a similar type of study has not been completed for Arizona, we are assuming the economic importance of livestock grazing in Arizona is similar to that in Wyoming. Even though the paper focused on BLM-administered land, grazing is managed in a similar fashion on Forest Service-administered land. Copies of all papers and fact sheets referenced in this section are included in the project record.

Social concerns and economic influences from the use of herbicides was discussed in the noxious weeds FEIS on pages 95-98 and 215-221, and is not repeated here. Little to no impact was the conclusion.

#### 3.3.4.1 Affected Environment

The permittee is involved in beef cattle production. To be successful they need economical sources of feed and water for their mother cows 365 days a year.

##### *Community Scale Context*

The allotment is in Coconino and Yavapai Counties, which are predominantly rural. The M-Diamond Ranch is in Yavapai County, and is surrounded by national forest for several miles in every direction. The 2003 Yavapai County Plan states a desire to preserve the rural character of the county. Page 9 of the plan states the following objective:

*Prevent breaking up rural areas characterized by farms, ranches.....*

It is widely recognized that an important aspect of ranching in the west is that grazing on public lands typically has no viable substitute. Ranch operations in the west have built and maintained their operations with reliance on federal grazing permits. Relatively little grazing is available on private land, due to high land values. Without federal grazing land, operators would either have



to purchase more feed, find other private land to use for grazing, or change operations. Generally, the cost of grazing on other private land is several times the cost of grazing on federal lands, making it an unaffordable option.

According to a 2003 Agricultural and Resource Policy Report prepared by Colorado State University, agricultural lands in the west are under pressure to convert to rural residential uses. A socioeconomic analysis in neighboring Colorado was completed for the Canyons of the Ancients National Monument Resource Management Plan (CANM Plan). The Final Environmental Impact Statement for the CANM Plan states that traditional ranching and agricultural lands in Montezuma and Dolores Counties (Colorado) are being converted to low-density rural residential subdivisions (FEIS, 246). Farm size in these counties has decreased from 22-42 percent (FEIS, 246). Although the numbers for Yavapai County cannot be assumed to be the same as Dolores and Montezuma Counties, the landscape is similar, and therefore we are assuming the conversion trend would be similar.

The FEIS for the CANM Plan can be accessed here:

[http://www.blm.gov/co/st/en/BLM\\_Programs/land\\_use\\_planning/rmp/canyons\\_of\\_the\\_ancients/documents/prmp.html](http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp/canyons_of_the_ancients/documents/prmp.html)

Residential land use typically leads to a greater demand for community services, including police, emergency services, schools, and transportation infrastructure. The American Farmland Trust (AFT) reported in a 2007 Cost of Community Services Fact Sheet that, on average, residential development requires \$1.19 in community services for every \$1.00 of tax revenues it generates. In contrast, forest and farm land uses only require \$0.37 in services for every \$1.00 of tax revenue generated.

A paper titled "The Lack of a Profit Motive for Ranching: Implications for Policy Analysis" identified values associated with ranches that cannot be quantified in economic terms. Although the paper was specific to Colorado, the value placed on ranches is assumed to be similar throughout the west. The paper stated:

*"Urban Coloradoans value Colorado ranchers, not for the beef they produce, but for the open spaces they provide."*

This means that people associate an open-space value to ranches that cannot be quantified in terms of dollars. Other recognized public good values associated with agricultural land include: a diversity of ownership, preservation of wildlife habitat, preservation of cultures and traditions, and attractive contributions to the viewshed (pastures instead of buildings).

According to the paper "Livestock Grazing On The National Forests – Why Continue to do it?" there does appear to be a connection between rapid human development and declines in livestock grazing on public lands. The paper stated that the loss of farm and ranchland in Colorado averages 250 acres per day (90,000 acres per year). Although a figure for Arizona was not given, it is assumed that the trend in all western states is similar. This paper also states that when ranches have been around for 100 years, they become known as "Century Ranches", which helps



a community maintain a link to that part of their history and culture. The M-Diamond Ranch has been in existence for over 100 years.

It is recognized that there are individuals and organizations that are opposed to grazing on public lands and would like to see it end. The opposition is generally based on the argument that cattle are a non-native species that did not evolve with the western ecosystems. How prevalent this opposition is in Coconino and Yavapai Counties is unknown.

#### **3.3.4.2 Environmental Consequences – Direct, Indirect and Cumulative Effects**

##### **A. Alternative 1 – No Action/No Grazing – Direct and Indirect Effects**

The elimination of grazing on Buckhorn Allotment would have an immediate effect on the Permittee's livestock operations. It would affect the lifestyle of the Permittee, their immediate family, and anyone in their employment.

Without the grazing provided by Buckhorn Allotment, the Permittee's cost of production would rise and it is not likely the permittee would be able to continue a viable livestock operation. The costs of forage and other expenses to keep the cattle fed and healthy year-around would likely exceed the price received for the calves produced. Therefore, this alternative would likely cause the private ranch to cease operations. There would be an increased potential the ranch would be sold and converted to non-agricultural uses and be fragmented.

##### *Community Scale -No Livestock Grazing – Direct and Indirect Effects*

Livestock grazing would cease on the allotment. In the Wyoming Paper, the reductions in public land forage availability were evaluated over a 40-year time frame, and were calculated for 25%, 50%, and 100% reductions. The modeling data showed that a decrease in public grazing land would result in ranch operations shifting towards the less profitable selling of hay, and away from cattle. As a result, the pressure to sell the ranches off to non-agricultural uses, most likely rural housing, would increase. The loss of the ranch affected by this decision would result in Yavapai County losing a Century Ranch and part of their recognized Western Heritage. In addition, as stated previously in the AFT paper, shifting private land use away from agriculture, and towards rural residential development, would increase county expenditures more than revenues. This shift would also decrease open space and cause fragmentation of wildlife habitat.

There would be some job related economic impacts. Assuming the loss of income from the loss of federal grazing would not result in the ranch ceasing operations, the ranch would need to lease other grazing land or buy feed, which would boost the local economy. However, if the ranch did cease operations, there would be some job losses. Due to the small communities in which ranches are found, it is assumed that the loss of employment on private ranches would not be readily replaced by other economic activities.

##### **B. Alternative 1 – No Action/No Grazing – Cumulative Effects**

The cumulative effects evaluation considers all the agricultural land in Arizona and the Rocky Mountain West.



The AFT conducted a study called “Strategic Ranchland in the Rocky Mountain West.” The Executive Summary for that study is in the project file. The study identified seven threats to prime ranchland in seven western states, including Arizona. The AFT identified nearly 25 million acres of strategic ranchland in Arizona, Utah, Idaho, New Mexico, Wyoming, Colorado and Montana as vulnerable to residential development by 2020. Overall, 11% of all prime privately owned ranchland in the Rocky Mountain West is threatened by conversion to residential development by 2020.

Under the No Grazing Alternative, grazing would be eliminated from the allotment. There is high likelihood that the privately owned ranch would not be able to sustain operations and would be at an increased risk of being sold and possibly converted into a rural residential subdivision. Under this alternative, there would be a potential cumulative contribution towards a decrease in economic diversity for Coconino and Yavapai counties and loss of western heritage character. In addition, assuming the ranch is sold to a developer, the lost ranchland would combine with other lost ranchland in Arizona and across the Rocky Mountain West that is being converted into rural subdivisions.

#### **C. Alternative 2 - Proposed Action – Direct and Indirect Effects**

The proposed action would allow the Buckhorn Allotment Permittee to continue livestock grazing and sustain operations. The Permittee would experience some increased costs for improvements, including water developments and fencing.

##### *Community Scale – Proposed Action: Direct and Indirect Effects*

With sustainable operations, the privately owned ranch land would continue to be agricultural land. This would contribute towards:

- The Permittee being able to market beef.
- Not impacting local incomes (ranch employees)
- The Permittee’s privately owned ranch land continuing to be used for agricultural purposes, rather than possible conversion into rural residential areas.
- Maintaining privately owned open space.
- Maintaining habitat for wildlife
- Coconino and Yavapai counties maintaining part of their Western Heritage.

#### **D. Alternative 2 - Proposed Action – Cumulative Effects**

Since grazing would continue under an adaptive management system, this alternative would ensure the long-term sustainability of this land for grazing, and allow the affected ranch to maintain operations. Therefore, the ranch affected by this decision would be less likely to be converted into a rural subdivision. The privately owned ranchland would remain as part of the total amount of other privately owned agricultural lands in Arizona and the Rocky Mountain West. This would be a cumulative contribution towards maintaining open space, wildlife habitat, western heritage, and viewsheds.



### **3.3.4.3 Environmental Justice**

Executive Order 12898 directs federal agencies to consider Environmental Justice under NEPA. Environmental Justice requires evaluating whether a proposed action would have a disproportionately high and adverse human health or environmental effect on minority and/or low-income populations or Indian tribes, and consideration of that effect when making a decision.

In Coconino County, the only minority groups present in a percentage greater than the Arizona state percentage are American Indian and Alaska Native persons and persons claiming two or more races. In Yavapai County, the only group present in a percentage above the Arizona state percentage consists of white persons, not Hispanic. In Coconino County, the poverty level is higher than the state percentage, indicating a low-income population. In Yavapai County, the poverty level is below the state average. US Census Bureau Quick Fact sheets from which this information was obtained are in the project file.

Although there are minority and low-income populations present, the alternatives presented in this EA would not result in adverse, disproportionate effects to those groups. First of all, the land under consideration for grazing is federal land, and no minority populations live there or are potentially going to live there. Additionally, there is no data to suggest current ranch operations, sales of beef, and employment at the ranch is uniquely depended upon by any minority or low-income populations. Therefore, there would be no adverse, disproportionate effects to minority and/or low-income populations under either alternative,

The alternatives described in this EA would affect the permittee and anyone in their employment and anyone that purchases their beef.

### **3.3.4.4 Design Criteria**

There are no specific design criteria for economic and cultural values.

### **3.3.4.5 Conclusion Summary**

Under the No Action/No Grazing alternative, the private ranch would either have to shift operations, or cease operations. If the ranch ceased operations, there is a likelihood the ranch would be sold, and possibly converted to non-agricultural uses. This would affect the local community and the forest in various ways. There would be some local job losses, and Coconino and Yavapai Counties would lose a part of their western heritage.

Under the Proposed Action, the private ranch would be able to sustain operations and keep contributing the values described above to the local economy and culture.

There would be no effect related to Environmental Justice under either alternative.



### 3.3.5 Water Quality and Riparian Areas

This section briefly discusses the water quality of the area and how the alternatives may affect the water resource. This section does not address stock tanks because stock tanks are deliberately placed for livestock and are not part of the natural water resource. No stock tanks are proposed to be placed in streams under this proposed action.

#### 3.3.5.1 Affected Environment

Water quality in Arizona is determined by the Arizona Department of Environmental Quality (ADEQ). The following water quality determinations by ADEQ exist in the project area:

- Water Quality – 3.7 miles of West Clear Creek is listed as Category 1 (Attaining All Uses). Beaver Creek is Category 3 (Inconclusive) and the Verde River waters downstream is Category 4a (Not Attaining Uses).
  - Beaver Creek is listed as Category 3 (Inconclusive) with past turbidity impairments for warm water fisheries. The amount of allotment watershed area that contributes to runoff into the Beaver Creek watershed (portions of Wickiup and Winter Headquarters pastures) is very small (see map 5). Therefore, grazing does not substantially contribute to water quality in Beaver Creek.
  - The Verde River affected reaches outside the allotment are Category 4 (not attaining) and were previously listed as Impaired due to exceedences in the turbidity standard. The river currently has a Total Maximum Daily Load (TMDL) Plan, approved in 2002, that recommends management prescriptions to achieve State Water Quality Standards. Implementation of this plan is expected to improve water quality and includes improved grazing strategies that are incorporated into this proposed action strategy.

The Forest has about 40 water right claims, mostly on stock tanks and Hance Spring. There are about 5 private water right claims in the allotment. Neither alternative would affect water rights, so they are not discussed further.

The following riparian areas and perennial streams were identified within the project area:

- Riparian areas – 3.9 miles (3.7 miles West Clear Creek, 0.2 miles Willow Valley as recorded in the Forest Inventory).
- Riparian condition in the allotment is dominated by Proper Functioning Condition along West Clear Creek and a small reach of Willow Valley rates as Functional At Risk due in large part to high elk utilization.
- Identified Springs and Seeps –Hance Spring is Functional At-Risk. One unnamed spring in Winter Pasture is Functional at Risk.
  - Hance Spring is fenced, but the fence is routinely left open. Signs of livestock trespass are present. The soil is disturbed and there is little to no regeneration of cottonwood and willows.
- Perennial Streams – 3.7 miles (West Clear Creek). Parts of clear Creek pasture are the only areas in Buckhorn Allotment that have hydrologic connectivity to West Clear Creek. About 650 acres are proposed for grazing. However, these are located in upland areas outside of the riparian areas and the perennial stream.



- Proposed grazing in the Bullpen Pasture does not appear to be hydrologically connected to West Clear Creek since grazing would occur in upland areas located away from the stream and well buffered with vegetation from side-slopes and the riparian zone.

No wetlands were identified within the project area. Although streams can be classified as wetlands, they are discussed separately in this EA.

Page 29 of the BAWIP EA discusses effects to water quality from the use of triclopyr. No effects to water quality would result. Therefore effects to water quality from triclopyr are not discussed further.

### **3.3.5.2 Environmental Consequences - Direct, Indirect and Cumulative Effects**

Livestock can have a variety of effects on water quality, including bacterial contamination from waste, including fecal coliform, *Cryptosporidium*, *Giardia*, and *Salmonella*. Livestock also increase the sediment load and suspended solids in watercourses, resulting in turbidity. This occurs through trampling, disturbance, and erosion from denuded streambanks.

#### **A. Alternative 1 – No Action/No Grazing – Direct and Indirect Effects**

No livestock grazing would occur on Buckhorn Allotment. Livestock are currently unable to access the riparian areas of perennial streams to affect water quality. Since there is no influence from livestock in these areas, historical impacts from grazing would continue to recover at the same rate they are occurring today. Without livestock grazing, the impacts at Hance Spring and the unnamed spring would recover. This would be due to less localized sedimentation from the disturbed soil and increased growth of cottonwoods and willows.

In general, riparian species diversity, woody species age class diversity, and overall vegetative biomass would increase. As vegetation increases, stream channel shape would begin to change. Sediment would be trapped by vegetation, resulting in the development of floodplains. Over time, the width/depth ratios of the watercourses would decrease, and sediment transport capacity would become more effective.

Water quality would be expected to be maintained in their current categories, and sedimentation coming from the watershed would decrease due to the increase in vegetative cover and litter. The standing crop of forage would increase, and no additional compaction would occur from cattle. This would reduce erosion rates and decrease sediment loads.

#### **B. Alternative 1 – No Action/No Grazing – Cumulative Effects**

The improvements in water quality and riparian vegetation from historical grazing practices would combine with other water quality and riparian vegetation improvement projects, such as re-authorization of other grazing permits with adaptive management, for a cumulative contribution. Generally, these riparian improvement projects would be related to other allotments recovering from historical grazing practices.



### **C. Alternative 2 – Proposed Action – Direct and Indirect Effects**

Livestock currently are not able to access the riparian areas associated with perennial streams. Under the proposed action, this would not change. Therefore, water quality and riparian areas on perennial streams would continue to improve from historical grazing practices at the same rate as under the no action alternative. New drinkers and pipelines would be constructed under the proposed action to reduce or eliminate the impacts to the springs, and allow them to recover.

Deferment of 1491 acres of Clear Creek Pasture and deferment of 418 acres in Bull Pen Pasture would keep cattle out of the sensitive riparian habitat in those pastures. The deferment in Clear Creek Pasture would also help maintain the PFC of West Clear Creek.

The effects to the riparian areas and water quality would be the same as described for the no action alternative. However, it is assumed that the improvements would take longer under the proposed action, with one exception. Some restoration work may occur in the Wickiup Watershed (see Section 2.2.2 A9). This would have an immediate effect of stabilizing soils, thereby reducing erosion and sedimentation.

### **D. Alternative 2 – Proposed Action – Cumulative Effects**

With one difference, the cumulative effect contribution of the proposed action would be the same as described for the no action alternative. However, it is assumed that the improvements would take longer under the proposed action.

The difference that must be recognized is that the proposed action would need to consider climate changes/cycles in determining the amount of livestock grazing that can occur. This is being discussed under this section because there have been recurring drought conditions in the southwest. Recurring drought affects the amount of water available, which affects the health and vigor of plants and wildlife. It is too difficult to speculate on what warming and cooling trends may be seen over the next few decades, but climate would be considered when making the annual decisions on how much grazing can occur.

Precipitation data is currently obtained from four weather stations. There are two weather stations in the summer zone, and two weather stations in the winter zone. For more specific information on the weather stations, see page 13 of the range specialist's report.

#### **3.3.5.3 Design Criteria and Monitoring**

There are no specific design criteria for the proposed action because the livestock would not be able to access the riparian areas. No new monitoring would occur. Monitoring to ensure the Permittee complies with the AMP would continue in the same way it is done today.

#### **3.3.5.4 Conclusion Summary**

The effects to water quality and riparian areas are the same for the no action alternative and the proposed action. Because livestock would not be accessing the riparian areas under both alternatives, riparian areas that were affected by historical grazing practices (not the current Permittee) would continue to recover, which would improve water quality. Under both



alternatives, the impacted springs would recover, but it is assumed that recovery would be over a longer time frame under the proposed action, with the exception of the Wickiup Watershed. Restoration work would result in immediate improvements that would not occur under the no action alternative.

### **3.3.6 Wildlife**

This section describes the wildlife (excluding fish, which are discussed in Section 3.3.9) found within the project area and the effects of each alternative on the wildlife. Buckhorn Allotment provides a variety of habitat types that support a diverse array of species. To determine potential effects, the wildlife was evaluated in several categories:

- Non-Special Status Species (Game Animals, General Wildlife)
- Threatened and Endangered Species and Critical Habitat
- Forest Service Sensitive Species
- Other Special Status Species
- Management Indicator Species
- Migratory Birds

Pages 161-165 of the noxious and invasive weeds FEIS discuss the effects to wildlife from triclopyr. Triclopyr is mildly toxic to humans and animals, but is considered to be only a slight irritant to the skin and eyes from direct contact. The risk assessments concluded that wildlife would not be affected by triclopyr at the expected exposure levels. Since exposure levels would be the same in this proposed action, there would be no effect. Therefore, the effects to wildlife from triclopyr are not discussed further.

All ground-disturbing activities affect wildlife species, and cause destruction or modification to wildlife and plant habitat. However, ground-disturbing actions are planned in ways to minimize (and when possible, to eliminate) effects to species and habitat. Specific design criteria, and known as Best Management Practices are used to reduce disturbances that would occur from project implementation.

The most wide-spread impact to wildlife is caused by livestock grazing. Livestock grazing of ground cover affects various species in many ways. These effects include: decreases in the quality and quantity of wildlife food, cover, and shelter; increased sedimentation into aquatic systems; reduced animal abundance; reduced abundance of prey species; and, decreased reproductive success).

#### **3.3.6.1 Affected Environment - Non-Special Status Species**

##### **A. *Game Species and Mammals***

Game species in the project area include: elk, mule deer, white-tailed deer, bear, bighorn sheep, mountain lion, bobcat, gray fox, coyote, javelina, cottontail, jackrabbits, squirrels and raccoons. Elk compete with livestock for forage and are responsible for depleting the range in some areas. The AZGFD is responsible for managing elk numbers. The permittee believes that elk numbers are high, and the elk are competing with livestock for forage, and are contributing to poor



rangeland conditions in some areas. Garrett Fabian, AZGFD, stated that there is a healthy elk herd in the area, but does not believe there is elk damage on an overall average. He stated that this past winter (2009-2010) did concentrate elk, which may have affected some localized areas more than usual, but that such concentrations are not the norm (e-mail in file). The non-game mammal species include chipmunks, mice, rats, woodrats, skunks, ring-tailed cats, and numerous species of bats.

#### **B. Birds**

There are many species of birds that occur on Buckhorn Allotment, and many are discussed in the special status species section. The majority of these birds on the allotment are passerines (perching birds), but other groups of birds include some waterfowl and wading birds, fowl-like birds, raptors, and various non-passerine birds such as kingfishers, doves, hummingbirds, and woodpeckers.

Merriam's turkey is present on the allotment. This species is a Coconino NF MIS species, as an indicator for late seral Ponderosa Pine. However, grazing does not impact this habitat type and therefore turkey was not analyzed under the MIS section of this report. Effects to Merriam's turkey were identified as a key issue due to concerns by AZGFD, so they are discussed in this section.

Turkeys do better in a rest-rotation type of grazing regime and with utilization not exceeding 40% in meadows and openings (Hoffman et al. 1993). Turkeys require tall herbaceous vegetation for nesting and the rearing of young. Grazing, resulting in low herbaceous cover, affects the suitability of habitat. Turkeys rely on grass seed in late fall and early winter, so excess grazing on winter range or grazing that reduces residual cover influences winter survival (Wakeling, 1991). Furthermore, overgrazing that leads to decreases of biodiversity and cover reduces the survivorship of the young. Although survivorship of the young is very low anyway due to predation and other factors, they rely on insects for food and require adequate cover (Rumble et al 2003). There is a positive relationship between healthy grassland and meadow systems and insect populations as a whole.

#### **C. Amphibians and Reptiles**

Amphibians on the allotment include toads, frogs, and salamanders. While the toads and frogs do not require perennial waters as adults, they are dependent on pools of water for laying eggs, as are the tadpoles until they grow into sub-adults. Adult salamanders require water for laying eggs and the larvae require constant water due to the length of their different life stages. Numerous species of lizards and snakes also occur throughout the allotment.

#### **D. Water**

Certain waters in Buckhorn Allotment have been identified as important to wildlife. They are important because they are the only consistent year-round water sources for wildlife on the allotment. They provide water for a variety of wildlife, including turkey and big game. Those waters are:

- Maxwell Tank in Brushy Pasture
- Tramway Tank in Dukey Pasture
- Coyote Tank in Maxell North Pasture



### **3.3.6.2 Environmental Consequences – Direct, Indirect and Cumulative Effects to Non-Special Status Wildlife Species**

#### **A. Alternative 1 - No Action- Direct and Indirect Effects**

Livestock would be removed from the allotment. In general, this would allow for optimal upland vegetative and soil conditions, which would increase the amount of food and cover available to wildlife and their prey. This would result in an increase in the quality, quantity and diversity of wildlife food, cover, and shelter for all species. This would result in taller herbaceous vegetation and more diversity of vegetation for Merriam's turkey.

This alternative would result in Maxwell Tank, Tramway Tank, and Coyote Tank no longer being maintained. These were identified as important wildlife waters. Without the Permittee maintaining these tanks, they would dry up and no water would remain for wildlife.

#### **B. Alternative 1 - No Action- Cumulative Effects**

Effects on the allotment are viewed as contributing towards forest-wide effects. Reasonably foreseeable actions on the forest that would affect wildlife resources are: reauthorization of other livestock grazing allotments, fuels reduction projects, forest thinning projects, watershed improvement projects, recreation management (obliteration of social trails and dispersed campsites, designation of trails and campsites), lands special use permits (new issuances and maintenance on existing structures), personal use activities, and new road construction.

Adaptive management would allow the Forest Service to quickly respond to any effects from livestock grazing that threaten wildlife. In addition to this proposal, various other grazing permits are being analyzed for renewal on the Red Rock District, such as permits for the Walker Basin, Apache Maid, and Peaks Allotments. The analyses for the possible reissuance of those grazing permits are being completed with adaptive management as part of the proposed action.

Fuels reduction and forest thinning projects affect wildlife and habitat. The effects are minimized through project design and planning, and many projects improve wildlife habitat. However, the improvements modify vegetation, which immediately affects foraging, nesting, roosting, hiding and thermal cover, and daily and seasonal movements. So, there is some disruption at first, but the improvements generally outweigh these initial impacts. Known future fuels reduction projects include: Upper Beaver Creek Watershed Fuels Reduction Project, Clint's Forest Restoration Project, Munds Park Fuels Reduction, and the Hart Prairie Fuels Reduction and Forest Health Project.

Wildfires contribute different effects, depending on the time of year, scale of the fire, intensity, severity, and associated management or suppression activities. Predicting where wildfire would occur is unrealistic but it is assumed the allotment would have wildfire activity within the next 10 years. The allotment has had multiple wildfires in years past (see Appendix 3) and has seen various effects; best management practices have been and would continue to be used for suppression activities. Wildfires that are managed for resource benefit are also unpredictable on where they would occur over the allotment. With both types of fire described above, a certain amount of recovery may be necessary to achieve acceptable to optimal habitat conditions over the landscape.



Unauthorized and unmanaged dispersed recreation affects wildlife and habitat. Social trails, social roads, and dispersed camping: denude vegetation and compact soils; disturb rocks and vegetation to which some species may be attached; crush life forms such as eggs and caterpillars; collapse burrows; alter and fragment habitat; increase sedimentation into aquatic systems; introduce and/or spread noxious weeds; visually and aurally disturb animals during critical periods such as breeding, roosting; and harass individuals through collection or handling. A travel management EIS is being prepared to implement the Travel Management Rule on the Coconino National Forest. Once implemented, this would affect most species by reducing cross-country motorized travel and the densities of roads within species habitat, thereby reducing fragmentation.

This alternative would combine with other projects designed to improve wildlife habitat for a cumulative effect contribution across the allotment and forest.

### **C. Alternative 2 - Proposed Action – Direct and Indirect Effects**

Under this alternative, livestock grazing and the associated management activities would continue on the allotment. This would result in less than optimal habitat for wildlife because the effects that have been present from livestock grazing for the past 100 years would continue.

These effects include:

- The sight and sound of vehicles and ranch personnel disturbing and displacing nearby wildlife
- Trampling of individuals and burrows by livestock
- Consumption of food sources, such as seed heads, by livestock
- Compaction of soils by livestock, especially around water sources
- Reductions in cover by livestock grazing, making wildlife nests and individuals more visible
- Livestock waste affecting water quality in tanks and ponds. The nutrients cause algae to grow. When the alga decomposes, it results in lower dissolved oxygen levels in water.

The above potential impacts likely occur in those areas that are frequented by livestock, which includes areas adjacent to water sources. Because only a portion of the allotment is grazed, and within that grazed area only a portion is heavily grazed, the potential effects described above do not occur throughout the allotment. No specific problems, concerns or threats to any species have been identified in association with these potential effects.

#### Merriam's turkey

The effects to Merriam's turkey would be similar to those described for the No Action Alternative. Although livestock would still be present, specific design criteria would ensure adequate habitat is maintained for Merriam's turkey. The design criteria in Appendix 2 would maintain a diversity of grasses and certain stubble heights. Adaptive management would allow changes in livestock management if impacts to turkey habitat or individuals are identified.



### Wildlife Waters

This alternative would maintain the three important water sources for wildlife. The proposed action recommends water is left in Maxwell, Tramway, and Coyote tanks for wildlife use after domestic livestock have been removed from the grazing unit. To avoid unnecessary wildlife drownings, any storage tanks or troughs with open water would be properly fitted with wildlife ramps, using recent specifications provided by Bat Conservation International.

### Herbicide

The proposed herbicide treatments would result in the temporary loss of nesting and roosting habitat for various birds. Some rodents, such as the kangaroo rat, burrow around the bases of shrubs and this habitat would also be lost with herbicide treatment. This would not threaten the survival of any species. The objective of the treatment is to open the canopy and reduce competition for water so that native herbaceous vegetation can re-establish. An increase in native herbaceous vegetation would provide increased forage, increased cover, and increased prey for various species.

#### **D. Alternative 2 – Proposed Action - Cumulative Effects**

Even though livestock would continue to graze on the allotment, adaptive management would allow for moving towards or maintaining desired conditions. Therefore, the cumulative effect contribution would be the same as the no action alternative.

#### **3.3.6.3 Affected Environment – Threatened, Endangered and Candidate Species**

Six Threatened, Endangered or Candidate Species either have been identified in the project area or have potential habitat in the project area. These species are:

- Mexican Spotted Owl
- Southwestern Willow Flycatchers
- Bald Eagles (wintering and nesting)
- Western Yellow-billed Cuckoo
- Chiricahua Leopard Frog
- Mexican Garter Snake

#### **3.3.6.4 Environmental Consequences**

##### **A. Alternative 1 - No Action Alternative – Direct and Indirect Effects**

The No Action Alternative would remove livestock from the allotment. This would eliminate the potential for trampling of individuals and burrows by livestock. In addition, this alternative would leave more forage for wildlife and eliminate the potential for contaminating water with waste. Although there is a predicted effect, it is too slight to measure and would not affect the population of any threatened, endangered or candidate species, and therefore is considered to be no effect.

##### **B. Alternative 1 - No Action Alternative – Cumulative Effects**

There are no direct or indirect effects to combine with the direct and indirect effects from other actions; therefore there is no cumulative effect contribution.



### **C. Alternative 2 - Proposed Action – Direct and Indirect Effects**

For the threatened and endangered species listed above, except for the bald eagle, the proposed action either would have no effect or it may affect them, but is not likely to adversely affect them. This equates to a no effect determination.

Since deferment of Bull Pen and West Clear Creek would continue under this alternative, there would be no effects to the habitat identified there in section 1.2.1.

Since no effects would occur, threatened and endangered species are not discussed further in the EA. For details on how this determination was reached, see pages 27-62 of the wildlife biologist's report in the project file. The bald eagle is discussed in section 3.10.5 of this EA.

### **D. Alternative 2 - Proposed Action – Cumulative Effects**

This would be the same as was described for the no action alternative.

#### **3.3.6.5 Affected Environment – Sensitive Animal Species**

The Region 3 Sensitive Species List was reviewed for this analysis. Twenty-two sensitive species are present or have potential habitat within the analysis area. Those species are listed in Table 24.

<b>Table 24: Forest Service Sensitive Species†</b>		
Navajo Mogollon Vole	Wintering Bald Eagle	Arizona Toad
Plains Harvest Mouse	American Peregrine Falcon	Reticulate Gila Monster
Merriam's Shrew	Northern Goshawk	Narrow-Headed Garter Snake
Western Red Bat	Common black-hawk	Blue-black Silverspot Butterfly/Nokomis Fritillary
Spotted Bat	Ferruginous Hawk	Mountain Silverspot Butterfly/Nitrocris Fritillary
Greater Western Mastiff Bat	Abert's Towhee	Four Spotted Skipperling
Allen's Lappet-Browed Bat	Lowland Leopard Frog	-----
Pale Townsend's big-eared Bat	Northern Leopard Frog	-----

† A detailed description of the specific habitat for each species can be reviewed on pages 64-114 of the wildlife report in the project file.

#### **3.3.6.6 Environmental Consequences - Direct, Indirect and Cumulative Effects – Both Alternatives**

For the sensitive species listed above, the determination was that the no action alternative and the proposed action either would not impact a species, or that it may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability. For detailed information on how these determinations were reached for each species, see pages 62-114 of the wildlife biologist's report in the project file.

#### **3.3.6.7 Affected Environment - Bald and Golden Eagles**

Although not a sensitive species, the golden eagle is protected under the Bald and Golden Eagle Protection Act. Golden eagles have been observed in the winter soaring in the western portion of the allotment and feeding on animal carcasses on Cedar Flat. It is likely that golden eagles nest in canyons on the allotment, however, no nests are known.



Livestock grazing would occur near bald eagle winter roosts and in areas where wintering bald eagles forage. Although the mere presence of livestock would not affect bald or golden eagles, the livestock consume forage that provides habitat for eagle prey species. Less forage means less prey for the eagles. In addition, livestock management practices involving the use of vehicles, including ATVs, disturbs eagles. The construction of range improvements, including fences and drinkers also has the potential to disturb eagles due to noise and sight disturbances, and some slight loss and modification of habitat. None of the above effects have been identified as a concern for the eagles. Therefore, the effects of livestock grazing on bald and golden eagles are of low intensity and limited in scope.

#### **3.3.6.8 Environmental Consequences – Direct, Indirect and Cumulative Effects for the No Action Alternative and the Proposed Action**

A no effect determination was reached for the bald and golden eagle for both the No Action Alternative and the Proposed Action. Any effects are discountable because there would be “no take” of bald or golden eagle. A “no take” determination means:

- The action would not cause injury to an eagle
- The action would not cause a decrease in productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior.
- The action would not result in nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior.

Since there would be no effects to combine with the effects of any other past, present or reasonably foreseeable future activities, there would be no contributions towards a cumulative effect on bald or golden eagles.

#### **3.3.6.9 Affected Environment - Management Indicator Species**

Forest Service Manual 2620.5 states that management indicators are:

*Plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent.*

There are a total of 17 Management Indicator Species for the Coconino National Forest. For 12 of these species, indicator habitat or the habitat feature for which species are indicators would not be affected by the reauthorization of grazing. Those 12 MIS species were excluded from analysis. The MIS that were fully analyzed are: pronghorn, Lucy's warbler, yellow-breasted chat, Lincoln's sparrow, and cinnamon teal. See pages 116-133 of the wildlife report in the file for specific habitat descriptions.

#### **3.3.6.10 Environmental Consequences – Direct, Indirect and Cumulative Effects – Both Alternatives**

A determination was reached for all MIS that neither the no action alternative, nor the proposed action would result in a change in the forest-wide trend of any species. Therefore, MIS are not discussed further in this EA. For detailed information on how these determinations were reached for each species, see pages 116-133 of the wildlife biologist's report in the project file.



Since there are no effects that would combine with other past, present and reasonably foreseeable effects, neither the no action alternative, nor the proposed action would contribute towards a cumulative effect.

### 3.3.6.11 Affected Environment - Migratory Birds

Executive Order 13186 (January 10, 2001) requires federal agencies to consider management impacts to migratory birds. The following table shows the migratory bird species identified by either Partners in Flight as a priority species, or by the U.S. Fish and Wildlife Service as a bird of conservation concern that may occur on Buckhorn Allotment.

<b>Table 25: Migratory Birds on Buckhorn Allotment†</b>		
Three-toed Woodpecker	Grasshopper Sparrow	Costa's Hummingbird
Olive-sided Flycatcher	MacGillivray's Warbler	Crissal Thrasher
Virginia's Warbler	Red-faced warbler	Sage Sparrow
Cordilleran Flycatcher	Pinyon Jay	Bendire's Thrasher
Olive Warbler	Gray Vireo	Lawrence's Goldfinch
Greater Pewee	Gray Flycatcher	Elf Owl
Grace's Warbler	Black-throated Gray Warbler	Yellow Warbler
Lewis's Woodpecker	Band-tailed Pigeon	Gila Woodpecker
Flammulated Owl	Loggerhead shrike	Phainopepla
Purple Martin	Canyon Towhee	American Bittern
Swainson's Hawk	Black-chinned Sparrow	-----

† A detailed description of the specific habitat for each species can be reviewed on pages 134-162 of the wildlife report in the project file

### 3.3.6.12 Environmental Consequences - Direct, Indirect and Cumulative Effects – Both Alternatives

For all migratory birds evaluated above, it was determined that the no action alternative and proposed action would not result in any substantial effects to any species. Therefore, migratory birds are not discussed further in this EA. For detailed information on how these determinations were reached for each individual species, see pages 134-162 of the wildlife biologist's report in the project file.

Since there are no effects that would combine with other past, present and reasonably foreseeable effects, neither the no action alternative, nor the proposed action would contribute towards a cumulative effect on migratory birds.

### 3.3.6.13 Design Criteria and Monitoring

The proposed action has been designed with management practices to reduce effects to wildlife. For example, there are: restrictions on when work can occur within Mexican spotted owl habitat; requirements that fences be constructed to wildlife standards; and, requirements that entry and escape ramps be provided on tanks and drinkers. A complete list of design criteria for wildlife is in Appendix 2.



Wildlife monitoring would focus on managing for certain stubble heights, diversity of grasses, and an improved prey base. These requirements are listed in Appendix 2.

#### **3.3.6.14 Conclusion Summary**

Neither the No Action Alternative, nor the Proposed Action would have any discernible effect on wildlife, either general or special status species. Effects to Merriam's turkey was identified as a key issue, but the proposed action has been designed to allow for adequate turkey habitat, and adaptive management would allow adjustments to livestock grazing if any concerns with turkey populations or habitat is identified.

### **3.3.7 Invasive Species**

This section briefly describes the known invasive plant populations within the project area and how the alternatives may affect those populations. This section also includes a brief discussion on the herbicide treatment proposed for Heifer Pasture.

The Coconino National Forest does not have a complete survey of invasive plant species in the project area. Therefore, the discussion of invasive species is done from a qualitative perspective.

Page 35 of the noxious and invasive weeds FEIS describes how triclopyr works. Basically, it is applied to the individual plants by hand, gets absorbed into the plant, and disrupts the plant's growth.

#### **3.3.7.1 Affected Environment**

Noxious weeds and invasive exotics affect the composition, structure and the function of native ecosystems. In turn, this affects factors such as fire interval, and species composition within plant communities.

Various surveyors have identified noxious or invasive weed species in the analysis area. These infestations range from a few scattered plants to localized, severe infestations. Since the Permittee and the Permittee's employees represent more "eyes on the ground", this helps identify weed infestations, so they can be treated.

Livestock operations contribute to the spread of weeds by transporting seeds. The seeds of weeds are transported to different locations on both livestock and equipment.

Weed species of concern in the project area, along with their classification and the management objective are shown in Table 26:



<b>Table 26: Weed Species of Concern on Buckhorn Allotment</b>		
<b>Common name</b>	<b>FS Classification<sup>†</sup></b>	<b>Objective</b>
Downy brome	B	Eradicate/Control
Dalmatian toadflax	B	Eradicate/Control
Bull thistle	B	Eradicate/Control
Lehmann lovegrass	C	Contain
red brome	C	Contain
horehound	C	Contain
spreading wall flower	Exotic – not classed	Monitor
common stork's bill	Exotic – not classed	Monitor
Mediterranean stork's bill	Exotic – not classed	Monitor
tumble mustard	Exotic – not classed	Monitor

<sup>†</sup> A - Pose a serious threat and receive highest priority. Management emphasis is complete eradication.

B - Have limited distribution or are unrecorded in a region of the state but are common in other regions of the state.

Receive second highest priority. Management emphasis is to contain the spread, and eventually eliminate the infestation

C - Any other invasive weeds (exotic or native). This classification receives the lowest priority. Management emphasis is to contain spread to present population size or decrease population.

The proposed herbicide treatment in Heifer Pasture does not include the treatment of any of the above-listed weeds of concern. Therefore, the effect of triclopyr on those weeds is not discussed.

### **3.3.7.2 Environmental Consequences – Direct, Indirect and Cumulative Effects**

#### **A. Alternative 1 – No Action/No Grazing – Direct and Indirect Effects**

Livestock would not be present to carry seeds, and equipment used for livestock operations would no longer be present to carry seeds, slowing the potential spread. However, the spread of invasive plants would not stop under this alternative. Invasive plants would continue to spread from annual seed production and transport by wildlife. The Permittee and the Permittee's employees would no longer be on the ground conducting livestock operations, which would reduce the ability to identify weeds. Treatment of invasive plants would continue as funding allows.

#### **B. Alternative 1 – No Action/No Grazing – Cumulative Effects**

The spread of invasive species would continue, but at a slower rate than if livestock were present. Also, without the Permittee and Permittee's employees on the allotment, there is a greater chance that weed infestations would not be identified as quickly. The spread of invasive species on this allotment would contribute towards a cumulative effect by combining with the spread of invasive species on the rest of the forest. Other activities that spread invasive species are described in Table 27.



<b>Table 27: Past, Present, and Future Activities Contributing to the Spread of Invasive Species</b>	
Dispersed Recreation	Hikers, horses and vehicles transport seeds and plant parts
Thinning and Burning	These projects have occurred in the past and are expected to continue in the future. These activities leave areas of bare soil. Historically, these areas weren't treated and became ideal spots for invasive species to establish themselves. Recent thinning and burning, and all future projects, include provisions to limit the spread of invasive and treat known communities.
Road Maintenance	Can spread invasive species if they are growing next to the road being maintained. Resource protection measures are used to limit that spread
Fire Suppression	Vehicles transporting seeds and plant parts. The use of wash station and the avoidance of infested areas reduce the potential spread.
Invasive Treatments	Invasive species are treated with herbicides. This activity is expected to continue to reduce the spread
Road Construction And Decommissioning	Causes ground disturbance, which invasive plants can use as a seedbed. Road construction and decommissioning projects include provisions to limit the spread of invasive plants and treat known communities

### **C. Alternative 2 – Proposed Action – Direct and Indirect Effects**

Under this alternative, livestock and equipment would continue to act as carriers for seeds and plant parts. This would continue to spread existing invasive species across the allotment and also bring new seeds and plant parts into the allotment. Since the rate of spread depends on many factors, such as rainfall and whether or not a particular animal or vehicle is carrying a seed or plant, it is too speculative to try and predict rates of spread for any particular species. However, grazing at conservative levels would ensure that plants are grazed to maintain ground cover and litter. This would limit the potential for new non-native plants to establish and form a population.

Standard resource protection measures would be utilized to minimize the spread of invasive plants from livestock operations, such as the washing of vehicles. In addition, the Permittee and the Permittee's employees would be working on the allotment and be able to report any weed infestations they find to the RRRD. This would help make treatments more timely and effective.

### **D. Alternative 2 – Proposed Action – Cumulative Effects**

The cumulative effects would be the same as that described for the No Action Alternative with two differences. First, because livestock would be present on the allotment, they would also be a carrier for seeds and plant parts. Even though the livestock would be present, it does not necessarily mean the rate of spread of invasive species would be faster, although that is generally assumed.

Second, the rate of spread would have some potential to be offset because the permittee would be managing a herd on the allotment and would have a vested interest in reducing invasive species. Therefore, communities of invasive species would likely be identified and treated more quickly than if the herd was not present.



### **3.3.7.3 Design Criteria and Monitoring**

Under the Proposed Action, best management practices to limit the spread of invasive species would be utilized. Those best management practices for herbicide treatments were taken from the noxious and invasive weeds FEIS and appear in Appendix 2 of this EA.

There would be no additional monitoring for invasive species under the Proposed Action. Should grazing continue, monitoring for invasive species would continue the way it currently does, as part of the regular allotment monitoring. As populations are found, they are mapped and entered into a database. Proposed treatments would be reviewed by the district weed coordinator before they occur. The Permittee would be informed of any treatments that would occur.

### **3.3.7.4 Conclusion Summary**

There is no appreciable difference between the No Action/No Grazing Alternative and the Proposed Action. Under both alternatives the spread of invasive plant species would continue; standard treatment procedures would also continue.

## **3.3.8 Cultural Resources**

This section describes the cultural resources that are within the project area and the potential effects of each alternative on those resources. The specific locations of cultural resources are not disclosed in this EA. The locations of cultural resources are protected and are not kept in the project file.

Triclopyr herbicide has no potential to affect cultural resources and is not discussed in this section.

### **3.3.8.1 Affected Environment**

Some archeological surveys for other projects have been conducted on Buckhorn Allotment. Approximately 10 percent of the allotment, outside West Clear Creek Wilderness, has been surveyed. Since livestock are unable to access the wilderness area, it is not discussed further.

In the surveyed areas, 188 archeological sites have been located and recorded. Of the 188 recorded sites, 10 were previously determined eligible for, but are not listed on the National Register of Historic Places. All other sites are currently unevaluated, but would be treated as if eligible for the National Register of Historic Places. These sites would be protected until testing or additional information is obtained that would allow formal determinations of eligibility to be made.

Archeological survey coverage and site types and densities for Buckhorn Allotment are consistent with those of the surrounding areas. Known heritage properties range from prehistoric artifact scatters to pueblos and historic homestead sites. As evidenced by 85 percent of known sites in the area, the major prehistoric occupation of the allotment was that of the Southern Sinagua (A.D. 600 to 1450). There is one Yavapai/Apache wickiup site, and one roasting pit



site, dating to the protohistoric time period (circa 1400-1800). Euro-American use of the allotment is related to ranching, homesteading, mining, and timber harvesting, with site dates ranging from the 1870s to the present.

Archeological site distribution within the allotment may be interpreted as a system of settlements designed to take advantage of various resources such as soil, water, and wild vegetation. Site density tends to be low in the higher elevation, ponderosa pine dominated portions of the allotment. Site density ranges from moderate to very high in the middle and lower elevations. Sites tend to cluster around springs, along seasonal wetlands, in canyons, and in the pinyon-juniper vegetation zone.

Although the Yavapai and Apache clearly utilized West Clear Creek Canyon and the surrounding area, no tribe has specifically identified it as a traditional cultural property. There are no known specific plant gathering areas or traditional sacred sites within the allotment. The tribes have not expressed concerns regarding grazing and associated improvements within this allotment.

### **3.3.8.2 Environmental Consequences - Direct, Indirect and Cumulative Effects**

Impacts to cultural resources, especially sites, can be generally defined as anything that results in the removal, displacement of, or damage to artifacts, features, and or deposits of cultural material. In the case of cultural resources considered eligible for inclusion on the National Register of Historic Places, this can also include alterations of a property's setting or context. In the case of traditional cultural properties and sacred places, additional considerations may include alterations in the presence or availability of particular plant species.

Discussions with the Arizona State Historic Preservation Office indicate a general opinion that livestock grazing has some continuing, but minor effect, on the condition of cultural resources. However, taking into consideration that the existing condition includes the effects of historic and unregulated grazing, the general consensus is that continuing livestock grazing with conservative stocking levels that move the environment towards desired conditions would not have an adverse effect on cultural resources.

Consultation with 13 tribes is ongoing. The following Native American Indian groups were notified of the project in the Coconino National Forest Annual Consultation letters dated July 6, 2007 and August 20, 2008, as well as the Forest's Schedule of Proposed Actions and quarterly updates: Dine' Medicine Man's Association, Fort McDowell Yavapai Nation, Hopi Tribe, Hualapai Tribe, Havasupai Tribe, Navajo Nation, Pueblo of Zuni, San Carlos Apache Tribe, San Juan Southern Paiute Tribe, Tonto Apache Tribe, Yavapai-Apache Nation, Yavapai-Prescott Tribe, and White Mountain Apache Tribe. No issues or concerns regarding continued grazing or associated improvements within the allotment were expressed by any tribal group.



**A. Alternative 1 – No Action/No Grazing – Direct and Indirect Effects**

No livestock grazing would occur. This would eliminate the potential for trampling at all sites (recorded and unknown) within the allotment. The allotment would move towards a condition of increased vegetation cover and more stable soils (see Soil and Hydrology sections). This would reduce the movement of artifacts and the disturbance of layers of cultural deposits. This would also reduce the visibility of sites to potential pothunters. This alternative would eliminate any possibility of cattle congregating in rock shelters to trample artifacts or leave dung deposits. This alternative would eliminate the need for any future range improvements and maintenance of existing improvements, which eliminates the possibility that one of these projects may accidentally damage a cultural resource. So, there would be no impacts to cultural resources from the No Action Alternative.

Any ground disturbing activities associated with removal of structural improvements would not be covered by this analysis, and would require separate consultation under Section 106 of the National Historic Preservation Act.

**B. Alternative 1 – No Action/No Grazing – Cumulative Effects**

There are several past and planned projects, in addition to ongoing dispersed recreation, that have impacts on individual cultural resources within the allotment. For instance, fuels treatment projects may include hand thinning within sites and would likely involve allowing fire to burn across sites that are not fire sensitive. This would likely increase the visibility of those sites to the public. Anticipated implementation of the Travel Management Rule would likely reduce the effects of unregulated recreation on sites by restricting vehicular access to certain areas of the allotment and by eliminating some roads that may go through sites. However, the additive effect of all the other projects and activities within the allotment combined with the proposed action would be negligible. Therefore, this alternative would not contribute towards a cumulative effect.

**C. Alternative 2 – Proposed Action – Direct and Indirect Effects**

The proposed action would continue livestock grazing on the Buckhorn Allotment. Impacts to cultural resources from livestock typically result from

- Livestock trampling sites and artifacts,
- The construction of range improvements, such as fences, damaging sites
- Livestock congregating in rock shelters to get out of the sun or rain.
- Removal of vegetation and erosion caused by livestock grazing which affects the movement of surface deposits and alters the setting and geographic context of sites.

Based upon the conclusions stated within the soils and hydrology specialist's report, implementing the proposed action is likely to move the allotment towards a condition of increased vegetation cover and more stable soils, but at a slower rate than the no action alternative. Any improvement in vegetative cover and soil conditions would benefit cultural resources, by reducing the visibility of sites and the movement of artifacts. As stated above, when livestock grazing continues under a scenario that moves the land towards desired conditions, an adverse effect would not occur.



The known rock shelters in Buckhorn Allotment are in the parts of the wilderness that livestock would not be able to access. Therefore, there would be no effects to rock shelters.

Sensitive cultural sites were identified in Clear Creek Pasture, but the proposed action would defer grazing on this pasture and therefore there would be no effect to those cultural resources.

#### **D. Alternative 2 – Proposed Action – Cumulative Effects**

The effects would be the same as described for the no action alternative.

##### **3.3.8.3 Design Criteria and Monitoring**

The proposed action includes several improvements intended to facilitate livestock grazing and improve soil and vegetative conditions. Specific cultural resource surveys would be completed to clear the construction of range improvements once their specific locations are determined. See appendix 4 for specifics on how the surveys would be conducted. If cattle are found to be congregating in rock shelters, use of barriers, such as fencing would be considered.

##### **3.3.8.4 Conclusion Summary**

There is no discernible difference between the effects of the no action alternative and the proposed action because both would allow for increased vegetation and more stable soils. However, it is assumed that the increased vegetation and more stable soils would take longer under the proposed action.

##### **3.3.8.5 Visuals**

The presence or absence of livestock on public land is subject of debate. Some people expect to see livestock grazing on public land as a symbol of the west and a symbol of the multiple-use mission of the National Forests. Others argue for the removal of livestock grazing from public lands because they believe domestic livestock does not belong, since they are a non-native species that did not evolve with the western United States ecosystems.

Deciding the presence or absence of cattle on public lands due to opposing land use values is beyond the scope of this analysis. Under law, livestock grazing is a legitimate use of the National Forests, and only Congress has the authority to make changes to that use. Therefore, this analysis does not evaluate the visual effects of the presence or absence of livestock. Rather, this analysis focuses on the visual effects of the range improvements that are used to manage livestock, and the effects to the land from the presence of livestock, and whether it is in compliance with the Visual Quality Objectives (VQOs) for the area.

##### **3.3.8.6 Affected Environment**

Grazing of domestic livestock has occurred in this area for over 100 years. Aspects of livestock management that would affect the scenic quality of the area are: trampled and/or missing vegetation and range improvements, such as water developments, cattleguards, and fences.



Range improvements and changes in vegetation and on the ground would only affect the foreground area, which the Forest Service Landscape Aesthetics Handbook defines as the area that a viewer can see up to 0.5 mile. Beyond this distance, the vastness of the landscape is clearly dominant over the visibility of range improvements such as fences and drinkers. However, we are assuming that most casual observers would probably not notice the condition of vegetation, the ground, or range improvements beyond an eighth of a mile (660 feet).

Forest plan VQOs in the project area range from Preservation to Modification. For a full description of these VQOs, consult the Coconino National Forest Plan. The Preservation VQO is inventoried in the West Clear Creek Wilderness. Partial Retention in the project area is the objective around the northwestern Wilderness boundary, the top of Buckhorn Mountain, and along Willow Valley. These objectives were inventoried and adopted in the 1989 Forest Plan. Since that time, additional trails have been constructed in the project area, increasing visitor access and visibility. The VQO along these trails: TR #31, TR #76, TR#38, and TR#36 is assumed to be partial retention for foreground views. Currently, the Forest is in the process of transitioning to the Scenery Management System and updating inventories and objectives to be adopted in the Forest Plan revision. At the project scale, direction is to update objectives as part of the project.

The visual impacts of livestock grazing vary with the type of grazing system used, but the critical factor in all systems is the carrying capacity or stocking rate of each pasture. Overgrazing with any system degrades the scenic quality of the landscape. Range improvement structures used to manage livestock include fences, cattleguards, and drinkers. While these structures help control livestock distribution, which benefits the vegetation, they can also reduce the scenic quality of the area. It can be assumed that the more miles of fences, acres of water developments, and number of cattleguards built, the greater the impact on scenic quality. However, these improvements can be designed to blend with the landscape. For example, water troughs can be camouflaged behind vegetation and painted flat, non-reflective colors so as not to be noticeable. Additionally, any problems associated with range improvements, such as a fence in disrepair, affects the scenic quality.

### **3.3.8.7 Environmental Consequences**

#### **A. Alternative 1: No Grazing – Direct and Indirect Effects**

Livestock grazing would no longer occur on this allotment. The removal of livestock grazing on these allotments would be expected to result in improvements to vegetation, wetlands and riparian areas, and wildlife. Cattle droppings would disappear from the landscape over the next few years. The area would still be grazed by wildlife, such as elk. Without cattle present, wildlife may graze the area more intensely, but wildlife native to the area moves more rapidly across the landscape than cattle. Overall, there would be less grazing pressure on the land.

Since cattle are domestic, properly managed cattle can be used for resource improvements. For example, targeted grazing can be used to perform vegetation treatments. Without cattle, targeted grazing would be unavailable as a tool.



Over time, some of the range improvements may be removed from the landscape. This would benefit the natural scenic character of the landscape. The removal of livestock from these allotments would not affect any other land uses that are occurring, such as recreation. This alternative would not affect the VQOs for the area.

**B. Alternative 1: No Grazing – Cumulative Effects**

Under this alternative, the allotment condition would be expected to improve. This is based on general observations of pastures that have not been grazed for several years. Therefore, the improvements would combine with other projects designed to move areas of the forest towards desired conditions, for a cumulative effect. These other projects may include: changes in grazing management on other allotments, prescribed burns, re-seeding areas with native vegetation, and invasive species treatments. This would not affect the VQOs for the area.

**C. Alternative 2: Proposed Action – Direct and Indirect Effects:**

This alternative would continue the change in visual resources that began when livestock grazing was first introduced. There would be no immediate effect to the visual quality of the landscape. However, since this alternative incorporates some additional management requirements and the principles of adaptive management, there would be more flexibility for the Forest Service to make adjustments in numbers and season. This flexibility would allow the Forest Service to more quickly respond to monitoring data to move the land towards desired conditions. Under this alternative, the quality of vegetation is expected to improve, which would improve the viewshed.

Under this alternative, new range improvements would be constructed, including fences, water pipelines, drinkers, storage tanks, corrals, cattleguards, and gates. These improvements would impact the visual landscape, but they would be designed to minimize contrast, and their impact would be negligible. This alternative would not affect the VQOs for the area.

**D. Alternative 2: Proposed Action – Cumulative Effects**

This alternative is expected to move the landscape towards desired conditions. Therefore, this project would combine with other projects designed to move areas of the forest towards desired conditions, for a cumulative effect. These other projects may include: changes in grazing management on other allotments, prescribed burns, re-seeding areas with native vegetation, and invasive species treatments. This would not affect the VQOs for the area.

**3.3.8.8 Design Criteria and Monitoring**

Standard design criteria for range improvements would be required where improvements would likely be seen by Forest visitors from trails and roads in the project area. The criteria includes various camouflaging techniques. For specifics, see Appendix 2.

Range improvements, such as fencing and drinkers, would be camouflaged by using self-weathering steel or painting improvements flat colors that blend with the landscape. Dull, rusty



materials would be favored over bright or galvanized materials to ensure elements blend with the natural landscape character.

### **3.3.8.9 Conclusion Summary**

In the short-term, there would be no discernible difference in effects between the No Action Alternative and the Proposed Action. Both alternatives would be in compliance with the VQOs for the area.

In the long term, the range improvements would not be maintained under the No Action Alternative; they would fall into disrepair. Under the Proposed Action, the permittee would continue livestock grazing operations, which involves maintaining range improvements. In addition, any new improvements would be constructed according to Best Management Practices for blending into the landscape. For example, fences would be rustic in appearance, and drinkers would be painted flat, non-reflective colors and placed in areas where they would not be readily seen by the casual observer on a highway.

### **3.3.9 Fisheries**

This section discusses the potential effects of the alternatives on fisheries. Since the livestock on the Buckhorn Allotment are effectively prevented from accessing the streams and riparian areas due to topography, the fisheries resource is only discussed briefly.

#### **3.3.9.1 Affected Environment**

The primary watersheds affected by activities on Buckhorn Allotment are West Clear Creek and Lower Wet Beaver Creek. These watersheds contain species or suitable habitat for threatened, endangered, and sensitive fish species. Portions of two pastures are in the Wet Beaver Creek watershed, but the area was determined to be too small to have any measurable effect on the watershed. For that reason, effects to the Wet Beaver Creek Watershed were not analyzed.

The following threatened, endangered, candidate, and sensitive species are known to occur, or have existing or potential habitat, within the project area, include:

- Colorado pikeminnow (endangered species)
- Razorback sucker (endangered species)
- Loach Minnow (endangered species)
- Spikedace (threatened species)
- Headwater chub (candidate species)
- Roundtail chub (candidate species)
- Desert sucker (sensitive species)
- Sonora sucker (sensitive species)
- Longfin Dace (sensitive species)

Macroinvertebrate data from ADEQ was also reviewed to evaluate the health of West Clear Creek and the Middle Verde River. Macroinvertebrates are a MIS.

Livestock affect aquatic habitat in a number of ways.

- Increased sedimentation (this is the biggest concern)
- Loss of riparian vegetation



- Altered macroinvertebrate assemblages
- Lowering of groundwater tables
- Decreased perennial flows
- Increased stream temperature
- Larger peak flows
- Changes in channel form

Simulations have shown that storm runoff is 2-3 times higher in watersheds that are “heavily” grazed compared to those that are “lightly” grazed. This is due to factors including soil compaction and loss of vegetation. This increased runoff deepens and reshapes stream channels. The deepening of the channel causes floodplains to drain, resulting in lower groundwater tables. This dries the soils and results in a loss of riparian vegetation. The loss of the streamside vegetation results in erosion and less shade on the stream, which causes water temperatures to rise.

Stock tanks limit and trap sediment that otherwise would end up in streams. They also capture surface water and precipitation and allow it to soak back into the ground, helping to recharge the subsurface aquifer. This capture of water also helps reduce the volume of water entering the stream during storm events. Problems occur when the soil berms of the stock tanks fail and sediment drains to the stream. Stock tanks also provide habitat for non-native species that can affect the streams, including crayfish, bullfrogs and non-native fish.

### **3.3.9.2 Environmental Consequences**

#### **A. Alternative 1 – No Action/No Grazing – Direct, Indirect and Cumulative Effects**

Livestock would be removed from Buckhorn Allotment. This would not result in any effects to the fish or macroinvertebrates.

Since there would be no effects to combine with the effects of other activities, this action would not contribute towards a cumulative effect.

#### **B. Alternative 2 – Proposed Action – Direct, Indirect and Cumulative Effects**

Livestock grazing would continue on Buckhorn Allotment. The proposed action requires grazing at conservative levels, and the livestock are unable to access the riparian areas and streams. Therefore, there would be no effects to fish or macroinvertebrates.

Since there would be no effects to combine with the effects of other activities, this action would not contribute towards a cumulative effect.

### **3.3.9.3 Design Criteria**

No design criteria were developed in relation to fish because under the proposed action there would be no effects to fish or macroinvertebrates.



#### **3.3.9.4 Conclusion Summary**

Neither the no action alternative, nor the proposed action would have any effect on fish or macroinvertebrates.

#### **3.3.10 Recreation**

Recreation in the project area includes camping, hunting, hiking, horseback riding, firewood gathering, searching for shed antler, hiking, off-road vehicle travel, and driving for pleasure.

Effects to recreating people from the two alternatives would be variable, depending on one's personal views on livestock grazing. This evaluation focuses on whether livestock grazing is compatible with the Recreational Opportunity Spectrum (ROS) for the area.

##### **3.3.10.1 Affected Environment**

The Buckhorn Allotment contains the following six ROS classifications:

- Primitive
- Rural
- Roaded Natural
- Semi-Primitive Motorized
- Semi-Primitive Non-Motorized
- Urban

Livestock grazing does not conflict with any of these classifications. A highly used recreation corridor is located in Clear Creek Pasture.

##### **3.3.10.2 Environmental Consequences – Direct, Indirect and Cumulative Effects - Both Alternatives**

Since livestock grazing is not required under any of the ROS classifications and livestock grazing does not conflict with any of the ROS classifications, there would be no effect from either alternative.

Under the proposed action, West Clear Creek Pasture would be deferred from grazing, and therefore any potential conflicts between recreational users and grazing activities would be eliminated.

Since there would be no direct or indirect effects to combine with the effects of other actions, there would be no cumulative effect contribution.

##### **3.3.10.3 Design Criteria**

No design criteria were developed for maintaining the ROS classifications because under the Proposed Action there would be no effects to the ROS classifications.



#### **3.3.10.4 Conclusion Summary**

Neither the No Action Alternative, nor the Proposed Action would have an effect on the ROS classifications for the area.

#### **3.3.11 Wilderness**

This section briefly discusses the grazing on about 1000 acres of the Clear Creek Wilderness.

##### **3.3.11.1 Affected Environment**

About 10,000 acres of the allotment are part of the West Clear Creek Wilderness. Of those 10,000 acres of wilderness, only about 1,000 are being grazed. The remaining 9,000 acres cannot be accessed by livestock due to steep slopes and existing fences.

Grazing in wilderness is permitted.

##### **3.3.11.2 Environmental Consequences**

###### **A. Alternative 1 - No Grazing - Direct, Indirect and Cumulative Effects**

Cattle would no longer graze the 1000 acres of West Clear Creek Wilderness. Effects to vegetation would be the same as described in Section 3.3.1.2 A-B. This would not cause or contribute towards a change in the classification of this area as wilderness.

###### **B. Alternative 2 – Proposed Action – Direct, Indirect and Cumulative Effects**

Cattle would continue to graze 1000 acres of the West Clear Creek Wilderness. Effects to vegetation would be the same as described in Section 3.3.1.2 C-D, with one exception. Except for a drift fence, as an adaptive management option, no range improvements are proposed within wilderness. The proposed action would not cause or contribute towards a change in the classification of this area as wilderness. Adaptive management would allow for greater flexibility to reach the desired conditions on the ground. So, as vegetation improves, wilderness character would be enhanced.

#### **3.4 Cumulative Effects Summary**

Although cumulative effects were discussed under each resource, this section provides a summary of the effects that would be relevant for the Responsible Official to consider in making a decision. The resources that would contribute towards a cumulative effect and what those effects are have been summarized in Table 28.



<b>Table 28: Cumulative Effects Summary Table</b>		
<b>Resources</b>	<b>Alt 1 – No Action</b>	<b>Alt 2- Proposed Action</b>
<b>Rangeland Resource</b>	Contribute towards increased plant growth and improvement of range conditions across the forest	Same as no action but likely at a slower rate†
<b>Upland Vegetation – Special Status Species</b>	None	None
<b>Soils</b>	Progress towards upland utilization standards. Historical grazing impacts recovering	Same as no action but likely at a slower rate.
<b>Economic Social and Cultural</b>	Likely contribute towards the loss of agricultural land in the west	Would maintain the private ranch and prevent it from being lost as agricultural land.
<b>Water Quality and Riparian</b>	Would contribute towards improvements across the landscape through recovery of eroded areas	Same as no action, but likely at a slower rate.
<b>Wildlife</b>	Would combine with other habitat improvement projects for optimal upland conditions, although the water tanks would be lost	Would combine with other habitat improvement projects for optimal upland conditions, but likely at a slower rate. Would retain the water tanks for wildlife.
<b>Invasives</b>	There would be no livestock to contribute towards the spread of invasives. There would also be less “eyes on the ground” for the identification of infestations	Livestock would continue to contribute towards the spread of invasives. There would also be more “eyes on the ground” for the identification of infestations.
<b>Cultural Resources</b>	None	None
<b>Visuals</b>	None – VQOs for the area would be maintained	None – VQOs for the area would be maintained
<b>Recreation</b>	None – ROS for the area would be maintained	None – ROS for the area would be maintained
<b>Wilderness</b>	None – Area would remain wilderness.	None – Area would remain wilderness

† It would be too speculative to try and assign rates of improvement

### 3.5 Relationship of Short-Term Uses and Long-Term Productivity (all resources)

The objective of the proposed action is to continue livestock grazing at levels that will ensure the long-term productivity of the land.

If livestock grazing is removed from the allotment, it would result in the long-term productivity of the upland vegetation on the allotment. However, continuing livestock grazing, using the principles of adaptive management to respond to changing conditions would also allow for the long-term productivity of the land.

There is no short-term use of the land under this proposed action that would affect the long-term productivity.



### **3.6 Irreversible and Irretrievable Commitments of Resources**

This section describes those effects that cannot be alleviated through design criteria or mitigations. There are two types, irreversible commitments of resources and irretrievable commitments of resources.

#### **3.6.1 Irreversible Commitments**

Irreversible commitments are those that generally cannot be reversed, such as the extinction of a species or the extraction of a mineral.

Under the no action alternative, there is a reasonable likelihood that the affected Permittee would be under pressure to sell their private ranch land for rural housing. Once ranches are subdivided, they generally cannot be restored. The loss of the private ranch, which is part of the greater Coconino ecosystem, and a valuable part of the local culture, would be irreversible.

Under the proposed action, no irreversible commitments of resources would occur. All management decisions made within the scope of this project would result in effects that could be reversed with a change of decision.

#### **3.6.2 Irretrievable Commitments**

Irretrievable commitments are things that are lost for a period of time, but can be recovered. In other words, the resource is irretrievable as long as the action is undertaken. An example is the construction of a road through a field. The vegetation is lost as long as the road remains. However, the vegetation can be restored if the road is removed.

Under the no action alternative, livestock grazing would no longer occur on Buckhorn Allotment. The livestock grazing activity and its associated social and economic effects would be irretrievable unless a decision to allow livestock grazing within the analysis area again is made. This assumes that a private ranch would still be in existence at a future time when livestock grazing would again be permitted.

Under the proposed action, livestock grazing would continue within the analysis area. The consumption of forage by the livestock and the space occupied by the livestock would be irretrievable commitments of resources as long as livestock grazing is allowed. If the livestock were not present, all the forage and space within the analysis area would be available for wildlife use.

### **3.7 Any Other Relevant Disclosures**

The Coconino Forest Plan is undergoing revision. When the revised plan is complete, it might contain rangeland management requirements that differ from the current plan. If the proposed action is approved, adaptive management would allow the Forest Service to make adjustments to ensure compliance with the new plan.

Because triclopyr is an herbicide, there may be concerns regarding its possible effects to the public. Pages 197-201 of the noxious and invasive weeds FEIS discusses potential public health effects from herbicides, and pages 205-206 specifically discusses triclopyr. Pages 213-214 discuss possible synergistic interactions of herbicides. Page 43 of the BAWIP EA discusses potential effects to workers handling the herbicide, and the general public.



In conclusion, with use of proper personal protective equipment, there would be no effect to workers. The risk of public exposure is negligible. Public entry would be restricted while the treatments are occurring. Any exposure would occur after the treatments and would require direct skin contact. The woody plants that would be treated offer no potential as a place for someone to sit, so any exposure would be incidental, and triclopyr breaks down rapidly (half-life of 45 days), so no reasonable effect to the public would occur.

#### 4.0 Consultation and Coordination

##### 4.1 Persons and Agencies Consulted Outside the Coconino National Forest

- Allotment Permittee
- US Fish and Wildlife Service
- Arizona Game and Fish Department
- State Historic Preservation Office

##### 4.2 Core Interdisciplinary Team

<b>Table 29: Core ID Team</b>		
<b>Name</b>	<b>Title</b>	<b>Area of Responsibility for this Analysis</b>
Janie Agyagos	Wildlife Biologist	General wildlife, TES, Sensitive Species, MIS, Migratory Birds
Travis Bone	Archaeologist	Cultural and Historical Resources Tribal Contact
Michael Chaveas	Acting District Ranger	Guidance and Direction June-August 2010
Mike Childs	Fisheries Biologist	Fisheries
Barbara Garcia	Wildlife Biologist	General wildlife, TES, Sensitive Species, MIS, Migratory Birds
Robert Garcia	Rangeland Management Specialist	Permittee Contact Rangeland Data Maps
Eric La Price	Biological Scientist/NEPA Coordinator ID Team Leader	NEPA Specialist Writer/Editor Socioeconomics and Cultural Lifestyle Visuals and Recreation Considering Climate Change
Laura Moser	Botanist	TES Plants Invasive Species/Weeds
Heather Provencio	District Ranger	Responsible Official
Amina Sena	Hydrologist	Waterways, floodplains, wetlands, watersheds
Rory Steinke	Watershed Program Manager	Soils



#### 4.3 Other Specialists Consulted

Table 30: Others Consulted		
Name	Title	Area of Responsibility for this Analysis
Sarah Belcher	Landscape Architect	Input on Visuals
Jennifer Burns	Recreation Staff Officer	Input on Recreation
Polly Haessig	NEPA Coordinator, Mogollon Rim Ranger District Previous ID Team Leader	Providing background information on the project
Debbie Hom	GIS Specialist	Mapping Support

#### 5.0 Resources Cited in this Environmental Assessment

This section does not contain the extensive citations that are found in each resource specialist report that is in the file. Those reports and their references are part of a public record that can be reviewed by any interested persons. Duplicating those citations and references in this document would add unnecessary length and not contribute towards a decision. This section contains resources that were directly cited in this EA.

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US Forest Service, 1987. Coconino National Forest Plan.

US Forest Service 2005, Final Environmental Assessment for Buckhorn Allotment Watershed and Wildlife Habitat Improvements.



# Appendix

- 1 - Maps and Photographs
- 2 - Forest Plan Management Area Descriptions, Standards and Guidelines, Proposed Action Design Criteria, and Monitoring Requirements
- 3 - Actions Considered During Cumulative Effects Analysis
- 4 - Glossary of Terms
- 5 - Decision Notice and Finding of No Significant Impact



# Appendix

Maps and the Survey

1. The Survey of the  
County of [County Name]  
and the City of [City Name]

2. The Survey of the [Survey Name]

3. The Survey of the [Survey Name]

4. The Survey of the [Survey Name]