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Environmental Assessment

Spitz Hill and Sitgreaves Grazing Project

Williams Ranger District, Kaibab National Forest
Coconino County, Arizona



Information Contact: Ariel Leonard, NEPA Planner
742 S. Clover Road
Williams, AZ 86046
aleonard@fs.fed.us
928-635-5614

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Chapter 1 – Purpose and Need

Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts:

- **Introduction:** The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency’s proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- **Comparison of Alternatives, including the Proposed Action:** This section provides a more detailed description of the agency’s proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental effects associated with each alternative.
- **Environmental Effects:** This section describes the environmental effects of implementing the proposed action and alternative. This analysis is organized by resource area. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison to the Proposed Action.
- **Agencies and Persons Consulted:** This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- **Appendices:** The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, and analyses of project-area resources, may be found in the project planning record located at the Williams Ranger District Office in Williams, AZ.

Introduction

The Spitz Hill and Sitgreaves Allotments are located on the Williams Ranger District of the Kaibab National Forest. They are adjacent to one another and contain 13,710 and 20,410 acres respectively. The Spitz Hill Allotment is bordered on the south by old Route 66, and FR 141 runs through the eastern portion of the allotment. The Sitgreaves Allotment is bordered on the west by State Highway 64 and lies one to two miles north of Interstate 40. The project area is located in portions of Township 22 North, Ranges 2, 3, and 4 East; and Township 23 North, Ranges 3 and 4 East (See attached proposed action maps for the Spitz Hill and Sitgreaves Allotments). The allotments are in Ecosystem Management Area (EMA) 2 and Arizona Game and Fish Department Game Management Unit (GMU) 7 West.

The Spitz Hill Allotment contains portions of the eastern slopes of Sitgreaves Mountain as well as Spitz Hill, Wright Hill, and Government Prairie. The Sitgreaves Allotment contains the western slopes of Sitgreaves Mountain, and topographic features such as Poquette Hill, Radio Hill, Fues Hill, and Bald Mountain. About half of the project area is dominated by ponderosa pine forest, the other half is a mix of prairie grassland, piñon-juniper woodland, and mixed coniferous forest.

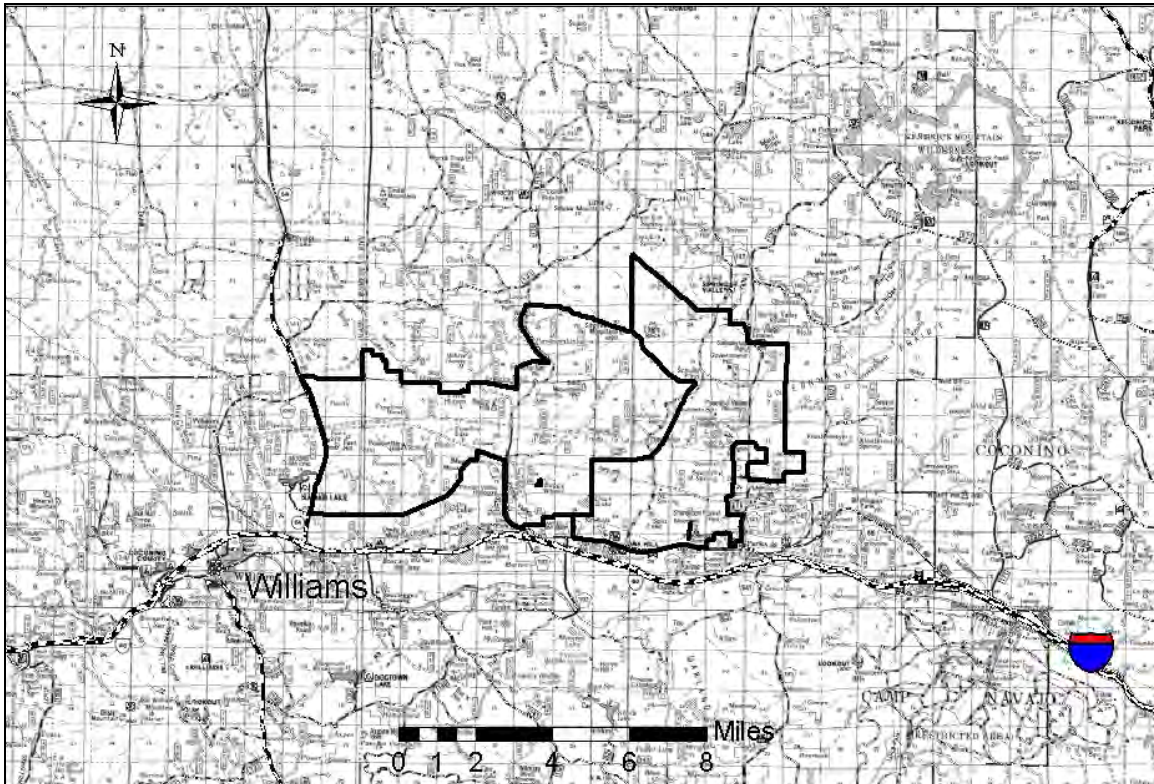


Figure 1. Vicinity map of the Spitz Hill and Sitgreaves Allotments

Current Management

The current permit for the Spitz Hill Allotment authorizes 195 adult cattle with a season of use from June 1 to October 16. The allotment is divided into five main grazing pastures and one smaller shipping pasture. The grazing system currently used is a four-pasture deferred-rotation system, with the Curry and Randall Pastures being used together as one pasture. The objective of this grazing system is to provide spring growing season deferment from livestock grazing to each pasture three years out of every four. The smaller pasture is used every year for ten to fifteen days in October for shipping cattle. Actual use has averaged 79% of permitted numbers from 1994 to 2001, with use varying depending on precipitation and forage production. In response to drought conditions from 2002-2004, actual use was reduced to 56%.

The current permit for the Sitgreaves Allotment authorizes 486 yearling cattle with a season of use from June 1 to October 15. The allotment is divided into three main grazing pastures and two smaller pastures that are used for shipping, holding, and working livestock. The grazing system currently used is a three-pasture deferred rest-rotation system. This system uses two pastures each grazing season and rests the third. Seasonal deferment is provided so that each pasture receives spring grazing one out of every three years. Current management results in livestock grazing up to 65 days in each pasture. Actual use averaged 84% of permitted numbers from 1993 to 2001, with use varying depending on precipitation and forage production. In response to drought conditions from 2002-2004, actual use was reduced to 5%.

Purpose and Need for Action

This proposal was initiated in response to range management regulations at 36 CFR 222, Subpart A, 222.2 (c) which requires the Forest Service to make forage available for livestock. In addition, Section 504 (a) of the 1995 Rescission Act (Public Law 104-19) requires the Forest Service to establish and adhere to a schedule for completion of National Environmental Policy Act analyses and decisions on all range allotments.

There are four components to the purpose and need: 1) to provide forage for domestic livestock as directed by the Kaibab Land Management Plan, 2) to maintain or improve range and soil conditions on the allotments, 3) to improve the cool season grass component, and 4) to improve cattle distribution on the allotments.

Kaibab Forest Plan Direction

The Kaibab National Forest Land Management Plan (USDA 2004) contains the following direction relating to the proposed project:

- Balance permitted grazing use with capacity.
- Produce the maximum amount of forage consistent with other resource values...on a sustained-yield basis.
- Cooperate with private range owners and other agencies.
- Maintain range conditions that will support prey availability for the Mexican spotted owl and Northern goshawk.

Existing Condition

Range condition on the Spitz Hill Allotment is fair with a stable to slightly downward trend. The slight downward trend is primarily attributable to drought conditions that have occurred over the past several years. The Sitgreaves Allotments is in a poor condition with a stable to upward trend. The poor condition is attributable to the scarcity of cool season grass species, tree encroachment, and recent drought conditions. Drought has been a factor in the loss of cool season grasses on both allotments (Chapter 3, p.18).

Desired Condition

The desired condition is to have a healthy range condition with a diversity of cool and warm season native plants that allows for livestock use on a sustained-yield basis without impairment to wildlife, soils, watershed, recreation values, or heritage resources.

Objectives

The following objectives have been identified for the Spitz Hill and Sitgreaves Allotments:

- Increase the cool season grass component by 20% over the next ten years.
- Maintain a stable to upward trend in range condition.
- Improve livestock distribution on the allotments to prevent regrazing of plants.

Proposed Action

The Forest Service proposes to reauthorize grazing on the Spitz Hill and Sitgreaves Allotments so that grazing permits may be issued. The Proposed Action contains changes from current management including changes to the grazing system, season of use, and structural improvements necessary to meet the purpose and need. The Proposed Action is summarized below (Tables 1 and 2). Although the proposed action shows a wider range of use dates than current management, season of use is expected to be administered much as it has been in the recent past. The permits would show a start date of June 1, but if “range readiness” has been established (See Glossary), livestock may enter the allotments as early as May 15. The proposed action maintains the current level of maximum authorized animal unit months (AUM). The design of this proposed action is intended to allow for administrative flexibility in reducing livestock numbers, adjusting specific on/off dates, and changing class of cattle as needed to meet objectives and attain desired resource conditions. More information about the Proposed Action , No Action, and other alternatives considered are displayed in Chapter 2.

Table 1. Proposed Action summary for the Spitz Hill Allotment.

Spitz Hill Allotment		CURRENT MANAGEMENT	PROPOSED ACTION
GRAZING SYSTEM		Deferred-Rotation 4 Pastures + 1 Shipping	Deferred-Rotation 5 Pastures + 1 Shipping
MAXIMUM SEASON OF USE		6/1-10/16	5/15 – 10/31
MAXIMUM ANIMAL UNIT MONTHS		885	885
AVERAGE ALLOWABLE UTILIZATION	KEY AREAS (See Glossary)	Prairie Pastures 40% Timbered Pastures 35%	Prairie Pastures 40% Timbered Pastures 35%
	UPLAND AREAS AND MSO HABITAT	20%	20%
RANGE IMPROVEMENTS		Maintain existing structures.	Remove, 0.8 miles of fence. Construct 0.1 mile of fence. Construct five roadside pit tanks.

Table 2. Proposed Action summary for the Sitgreaves Allotment.

Sitgreaves Allotment		CURRENT MANAGEMENT	PROPOSED ACTION
GRAZING SYSTEM		Deferred Rest-Rotation 3 Pastures + 2 Shipping	Deferred-Rotation 3 Pastures + 2 Shipping
MAXIMUM SEASON OF USE		6/1 – 10/15	5/15 – 10/31
MAXIMUM ANIMAL UNIT MONTHS		1531	1531
AVERAGE ALLOWABLE UTILIZATION	KEY AREAS	35%	35%
	UPLAND AREAS AND MSO HABITAT	20%	20%
RANGE IMPROVEMENTS		Maintain existing structures.	Approximately 1.6 miles of fence removal.

Decision Framework

Given the purpose and need, the responsible official will review the Proposed Action and the other alternatives in order to make the following decisions:

- Whether to authorize continued livestock grazing on the Spitz Hill and Sitgreaves Allotments.
- If livestock grazing is authorized, under what parameters and management practices livestock grazing will be implemented.
- Whether the selected alternative would have significant effects.

Public Involvement and Agency Coordination

This project was placed on the Kaibab National Forest’s Schedule of Proposed Actions in October, 2004. An initial project proposal was sent out to stakeholders and interested parties on April 12, 2005. Four comments were received. The proposed action was slightly modified and sent out for “Notice and Comment”. The 30-day comment period began on July 10, 2005 with a legal notice published in the *Arizona Daily Sun*. Coordination with affected grazing permit holders, the U.S. Fish & Wildlife Service, Arizona Game and Fish, and interested Indian tribes has been conducted. A biological evaluation was prepared for the Mexican spotted owl and concurrence was received from the U.S. Fish and Wildlife Service (dated June 3, 2005) with a determination that the Spitz Hill/ Sitgreaves Grazing Project is not likely to adversely affect the Mexican spotted owl or its critical habitat.

Issues

Using the comments received during the scoping and notice and comment periods, several issues were identified. An issue is defined as a discussion, debate, or dispute regarding effects. The issues were separated into two groups: significant and non-significant issues. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; 4) conjectural and not supported by scientific or factual evidence, or 5) limited in duration, distribution, and intensity, so that the level of effect is not significant. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of non-significant issues and reasons regarding their categorization as non-significant may be found in Appendix 2. Significant issues were defined as those that required changes in the proposed action to minimize or mitigate potential adverse effects. Two significant issues were identified. These issues and the agency responses are presented below.

1. Roadside pit tanks could attract wildlife to roadsides and be hazardous to wildlife and public safety.

Response: Six roadside pit tanks were originally proposed. Five out of the six locations are next to unmaintained dirt roads that do not receive a lot of vehicle traffic. Because of road conditions, most vehicles traveling on these roads do so at speeds slow enough to avoid vehicle/animal collisions.

One of the proposed pit tank locations was close to Forest Road 141, which is paved road with a posted speed of 35 mph. Although there are a number of water sources in the area, and the proposed pit tank would not likely concentrate wildlife, the Proposed Action was modified to drop this pit tank.

2. Cattle have a detrimental effect to the portion of the Duck Lake ephemeral wetland that is not fenced off.

Response: The Duck Lake ephemeral wetland (defined by 80 acres of hydric soils) contains two areas accessible to cattle, totaling 18 acres. The eight acres on the Spitz Hill Allotment is at the edge of the wetland and only contains standing water in very wet years. The ten acres of hydric soils on the Sitgreaves Allotment are in a shipping pasture that is normally used about 10 to 15 days a year. Because these soils are susceptible to compaction and deformation when they are wet, a mitigation measure has been added to the Proposed Action that prevents livestock use of these areas when the soils are vulnerable (See Mitigations, p. 13).

Chapter 2 - Alternatives

This chapter describes and compares the alternatives considered for the Spitz Hill and Sitgreaves Allotment. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public.

Alternatives Analyzed in Detail

Alternative 1 - No Action

Under the No Action Alternative, livestock grazing would not be authorized in the project area. Grazing permits would not be issued and range improvements would not be made.

Alternative 2 - Proposed Action

Spitz Hill Allotment

On the Spitz Hill Allotment, the Randall and Curry Pastures have been managed as a single pasture over the past several years. In order to reduce the number of grazing days each area receives, the proposed action would manage Randall and Curry as two separate pastures. This would result in a change from a four-pasture deferred rotation to a five-pasture deferred rotation. Additionally, five roadside pit tanks are proposed. Pit tanks are generally small (averaging 30 to 40 feet in diameter) and catch water runoff from roads to make it available for livestock and wildlife. These actions are intended to improve the cattle distribution across the allotment, reduce the potential for grazing the regrowth of important cool season grasses, and provide additional recovery time to the pastures.

Sitgreaves Allotment

The Sitgreaves Allotment has been managed under a three-pasture deferred rest-rotation grazing system which results in livestock staying up to 65 days in each of the two used pastures. The proposed action would change current management to a three-pasture deferred-rotation system. Under this grazing system, livestock use within each pasture would be seasonally deferred, and all three pastures would be used each year with an average grazing period of 38 days in each pasture. With a seasonal deferment, each pasture is grazed first in the rotation one out of every three years. This would provide spring growing season rest to each pasture two years out of every three. Reducing the average grazing period would decrease the potential for grazing the regrowth of important cool season grasses and provide additional recovery time. These management changes are expected to improve the vigor and density of the cool season grasses and the overall condition and trend of the allotment.

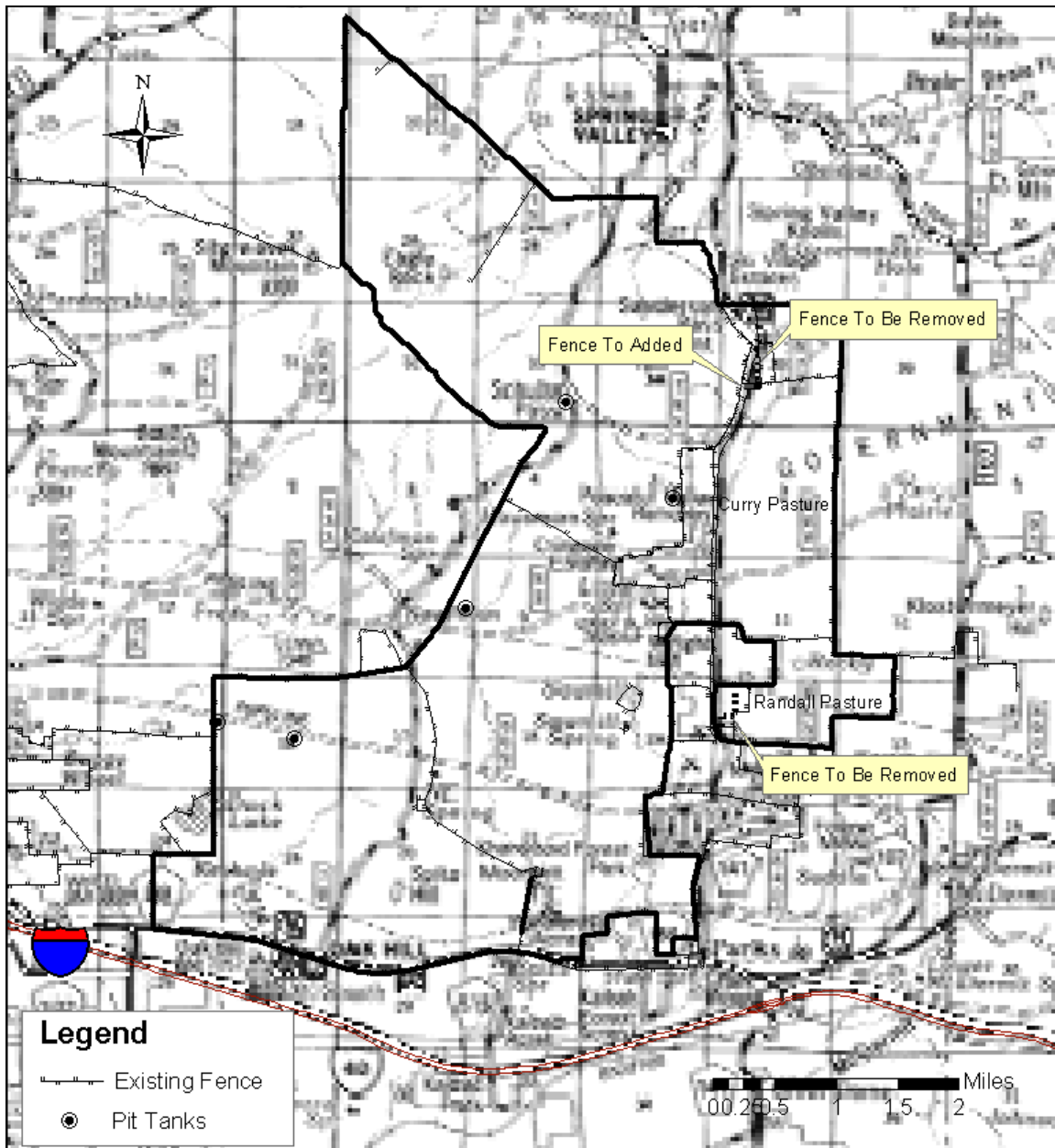


Figure 2. Proposed Action map for the Spitz Hill Allotment

Fence Modifications

Fence improvements are proposed on both allotments. On Spitz Hill Allotment, there is a section of fence that currently forms a narrow dead-end leg in the northwest corner of the Curry Pasture. This piece effectively forms a trap for wildlife and livestock. The proposed action would remove 0.3 miles of fence that runs north/south, and build 0.1 mile of east/west fence to tie into an existing fence. The new fence would have a smooth bottom wire 18 to 20 inches above the ground and be built to standard for Arizona Game and Fish Department pronghorn management.

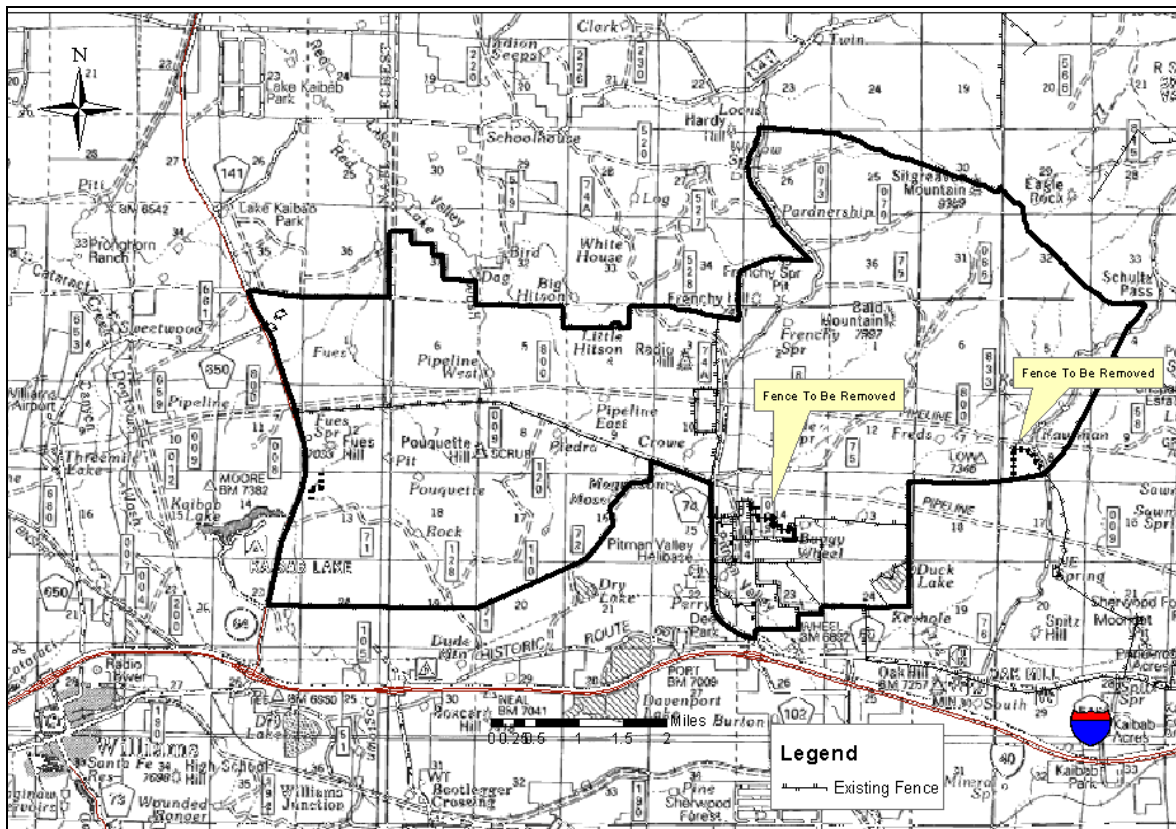


Figure 3. Proposed Action map for the Sitgreaves Allotment.

Additionally, the proposed action would remove three more sections of fence totaling 2.1 miles that are no longer needed. Approximately 0.5 miles of fence would be removed in the Randall Pasture on the Spitz Hill Allotment, and 1.6 miles of fence (two sections) would be removed in the Wade Pasture on the Sitgreaves Allotment (See Figures 2 and 3).

The Proposed Action does not include any “antelope” fence reconstruction, but fence modification work on the District is ongoing. A program of work involving approximately five miles of fence reconstruction and crossing installation is scheduled on the District each year. “Fence reconstruction” involves replacing the bottom strand of barbed wire with smooth and raising it to 18 to 20 inches above the ground. “Crossings” are constructed by placing PVC pipe over the top and bottom wires of the fence, then raising the bottom wire to a height of 20 inches to facilitate pronghorn passage underneath. On the Sitgreaves Allotment, five miles of fence was reconstructed to pronghorn standards in 2000. In 2002, thirty-seven crossings were installed along the boundary fences. Informal monitoring has shown that pronghorn and elk are using the modified crossings (PR# 14).

Considerations in Developing the Proposed Action

For both allotments, continuation of the current on-off dates was considered. However, in some years under current management (through administrative action), cattle have been allowed to come on to the allotments early or leave late by up to two weeks. This is because variations in weather can result in range readiness varying year to year. Early-on dates were authorized when the soils were dry and when doing so would not negatively affect the cool season grasses. The interdisciplinary team felt that the proposed action should reflect this occasional use. By including the extended dates in the proposed action, any potential effects of extending the on-off dates would be fully analyzed and concerns could be addressed.

Alternatives Considered, but Eliminated from Detailed Analysis

Current Management

Initially, the ID team considered including a “current management” alternative (PR#5). Currently, on the Spitz Hill Allotment, the Randall and Curry Pastures have been managed as one. The Proposed Action would be a change from current management, from a four pasture to five-pasture rest rotation system. This would improve cattle distribution on the allotment. Current management on the Sitgreaves Allotment is three-pasture deferred rest-rotation grazing system which results in livestock staying up to 65 days in each of the two used pastures. Long grazing periods can result in regrazing of plants. Because the Current Management Alternative would not result in improved distribution of cattle or reduced grazing periods (both of which would improve cool season grasses), it would not meet key objectives identified in the Purpose and Need. For this reason, this alternative was not carried forward (PR #5).

Full Adaptive Management Alternative

The ID Team also considered developing an alternative incorporating more flexibility. Recent agency guidance has been received that promotes increased flexibility using an adaptive management approach. In a full “adaptive management” approach, the proposed action defines limits such as timing, intensity, frequency, and duration of livestock grazing, without identifying specific practices or grazing systems (FSH 2209.13, Sec. 92.23 (b)). When an adaptive management proposed action is chosen, administrative actions within the defined limits of the NEPA-based decision can be implemented without additional NEPA. Examples of administrative decisions include changes in a) grazing systems, b) determination of season of use, c) specific livestock numbers, d) class of animal, and e) range readiness.

A full adaptive management approach requires a higher level of monitoring to determine if and what changes are needed in management. This alternative was considered, but not carried forward. The ID team felt that the proposed action allows for sufficient flexibility in the areas where it is needed. The ID team also believed that current funding levels would not cover the additional monitoring that would be needed. Additionally, without a clearly specified proposed action, the analysis of environmental effects would be more broad, complex, time consuming, and difficult to communicate to stakeholders and interested publics (PR# 11).

No Water Development Alternative

As a result of comments received, the ID Team discussed developing an alternative that did not include the installation of pit tanks. Because livestock tend to congregate in areas that have water, some parts of the pastures receive heavier use, while others receive little use. One of the primary objectives and components of the purpose and need is to achieve better livestock distribution to prevent regrazing of plants. Installation of pit tanks are key to achieving this objective. The comments and concerns related to pit tank installation were discussed and considered, but because this alternative does not meet the purpose and need it was not carried forward (PR# 28).

Reduced Grazing Alternative

The ID Team discussed developing a “reduced grazing” alternative in response to comments received. Although a reduced grazing alternative was suggested by three of the commenters, no site-specific resource issues were articulated to support its development. The ID Team typically develops alternatives and/or mitigations to address specific issues. Under the proposed action and current management, grazing use is adjusted in response to conditions to prevent adverse effects to resources. This results in reduced grazing as needed, particularly in drought years.

The resource specialists (ID Team) that developed the Proposed Action included mitigation measures to prevent the impairment of resources. Best Management Practices (BMPs) are specified to protect Soils and Watershed, and prevent the spread of Noxious Weeds. Additionally, consultation is conducted with the Fish & Wildlife Service and the State Historic Preservation Office (SHPO) to assess potential adverse effects to threatened or endangered species and heritage resources. Because no site-specific resource issues are known that call for a reduction in grazing, the ID Team did not carry forward the Reduced Grazing Alternative to be analyzed in detail (PR# 28).

Table 3. Comparison of alternatives for the Spitz Hill Allotment.

Spitz Hill Allotment		Alternative 1 No Action - No Grazing	Alternative 2 Proposed Action
GRAZING SYSTEM		NA	Deferred-Rotation 5 Pastures + 1 Shipping
MAXIMUM SEASON OF USE		NA	5/15 – 10/31
MAXIMUM ANIMAL UNIT MONTHS		0	885
AVERAGE ALLOWABLE UTILIZATION	KEY AREAS	Wild ungulates only.	Prairie Pastures 40% Timbered Pastures 35%
	UPLAND AREAS AND MSO HABITAT	Wild ungulates only.	20%
RANGE IMPROVEMENTS		None	Remove 0.8 miles of fence. Construct 0.1 mile of fence. Construct five roadside pit tanks.

Table 4. Comparison of alternatives for the Sitgreaves Allotment.

Sitgreaves Allotment		Alternative 1 No Action - No Grazing	Alternative 2 Proposed Action
GRAZING SYSTEM		NA	Deferred-Rotation 3 Pastures + 2 Shipping
MAXIMUM SEASON OF USE		NA	5/15 – 10/31
MAXIMUM ANIMAL UNIT MONTHS		0	1531
AVERAGE ALLOWABLE UTILIZATION	KEY AREAS	Wild ungulates only.	35%
	UPLAND AREAS AND MSO HABITAT	Wild ungulates only.	20%
RANGE IMPROVEMENTS		None	Remove approximately 1.6 miles of fence.

Standard Management Measures Implemented For All Allotments

- For cattle entry onto the allotments, range readiness must first be established. Soils should not be wet and the majority of cool season grasses must have emerged past the “boot stage” (after grass seed heads have emerged).
- Applicable Soil and Water Best Management Practices (FSH 2509.22) will be incorporated into management practices under this proposal (Appendix 3).
- Noxious weed prevention and control measures identified in the *Coconino, Kaibab, & Prescott National Forests Noxious and Invasive Weed Strategic Plan Working Guidelines Update: Integrated Weed Management Practices* will be used during implementation of this proposal (Appendix 4).
- Monitor project area annually, and control noxious weeds as necessary.
- Mineral supplements will not be placed in or adjacent to Mexican spotted owl protected or restricted habitat.
- Move salt stations annually and locate them at least one-quarter-mile away from watering sites. This keeps cattle better dispersed in the pasture and less likely to create bare ground.
- Archaeological surveys will be conducted and heritage clearance obtained prior to any ground-disturbing activity.

Mitigation Measures Specific to the Proposed Action Alternative

- Regardless of the normal scheduled season of use, the livestock-accessible portions of the Duck Lake ephemeral wetland will not be stocked when soils are “wet” (other than the stock tank itself). Soils will be assessed ten days after the disappearance of standing water for saturation and range readiness.
- No human activities or construction actions associated with livestock grazing will occur in Mexican spotted owl Protected Activity Centers on the Spitz Hill or Sitgreaves Allotments during the breeding season (March 1 through August 31).
- Construction of the pit tank near Shultz Pass will be built to meet scenic integrity objectives (SIO) for SIO-2, so that the structure is not evident to the casual observer.

Monitoring Specific to the Proposed Action Alternative

- Monitoring of utilization in key areas will be conducted in each pasture at the end of the growing season to ensure compliance with the established utilization standard.
- Using utilization cages, fenceline contrasts, and ocular estimates, grazing intensity will be assessed in key areas at least once during livestock use in each pasture. This is to assure that grazing intensity is not exceeded and to aid in identifying timing of cattle rotation through pastures.
- Within Mexican spotted owl habitat, grazing intensity monitoring will occur prior to livestock entering, during livestock use, and when livestock leave the pasture to assure that grazing intensity is limited to light use.
- Parker clusters will be read approximately every 10 years to determine range condition and trend.
- Paced transects will be done at approximately 5 year intervals to assess range condition.

Table 5. Summary of effects for the Spitz Hill Allotment by resource area.

Environmental Effect	No Action	Proposed Action
Vegetation		
Plant species diversity	Short-term increase, then stable.	Stable to slight increase.
Perennial forb cover	Short-term stable, then declining.	Stable to slight increase.
Perennial grass cover	Short-term increase, then stable.	Stable to slight increase.
Forage production	Short-term increase, then stable to declining.	Stable to slight increase.
Cool season plant density	Short-term increase, then stable.	Stable to slight increase.
Noxious weeds	Stable to downward trend.	Remain stable.
Rare plants	Stable to slight upward trend.	Remain stable.
Soil and Watershed		
Soil condition	Stable to slight upward trend.	Remain stable.
Watershed condition	Stable to slight upward trend.	Remain stable.
Ephemeral wetlands and springs	Stable to slight upward trend.	Stable to slight upward trend.
Wildlife		
Mexican spotted owl habitat	Stable to slight upward trend.	Stable. Grazing intensity would be monitored to provide cover for prey species.
Goshawk habitat	Stable to slight upward trend.	Stable. Grazing intensity would be monitored to provide cover for prey species.
Peregrine falcon habitat	Stable.	Stable. Peregrines nest in cliffs away from grazing and forage over large areas.
Habitat trend for species preferring more ground cover	Slight increase in habitat trend.	Stable to slight increase in habitat trend.
Habitat trend for species preferring less ground cover	Slight decrease in habitat trend.	Stable to slight decrease in habitat trend.
Wetland habitat	Slight increase in habitat trend.	Remain stable.
Population trend for species preferring more ground cover	Stable to slight increase in population trend.	Populations would remain stable.
Population trend for species preferring less ground cover	Stable to slight decrease in population trend.	Populations would remain stable.
Pronghorn movement	No fence removal, no change from current condition.	Minor improvements to pronghorn movement with "trap" and 0.7 miles of fence removed.
Pronghorn forage	Remain stable.	Remain stable.
Pronghorn fawning habitat	Slight increase in pronghorn fawning cover.	Stable to slight increase in pronghorn fawning cover.

Environmental Effect	No Action	Proposed Action
Heritage		
Heritage resources	No adverse effects.	No adverse effects.
Economic and Social		
Maintenance of ranching lifestyle	No	Yes
Dispersed recreation	Minor positive and negative effects.	Minor positive and negative effects.
Annual receipts to the Government (grazing fees)	None	\$1,377
Average annual cost to the Government	\$4,782	\$8,210

Table 6. Summary of Effects for the Sitgreaves Allotment by Resource Area.

Environmental Effect	No Action	Proposed Action
Vegetation		
Plant species diversity	Short-term increase, then stable.	Slight increase then stable.
Perennial forb cover	Short-term stable, then declining.	Stable to slight increase.
Perennial grass cover	Short-term increase, then stable.	Slight increase then stable.
Forage production	Short-term increase, then stable to declining.	Slight increase then stable.
Cool season plant density	Short-term increase, then stable.	Slight increase then stable.
Noxious weeds	Stable to slight downward trend.	Remain stable.
Rare plants	Stable to slight upward trend.	Remain stable.
Soil and Watershed		
Soil condition	Stable to slight upward trend.	Stable to slight upward.
Watershed Condition	Stable to slight upward trend.	Stable to slight upward.
Ephemeral wetlands and springs	Stable to slight upward trend.	Stable to slight upward trend.
Wildlife		
Mexican spotted owl habitat	Stable to slight upward trend.	Stable. Grazing intensity would be monitored to provide cover for prey species.
Goshawk habitat	Stable to slight upward trend.	Stable. Grazing intensity would be monitored to provide cover for prey species.
Peregrine falcon	Stable	Stable. Peregrines nest in cliffs away from grazing and forage over large areas.
Habitat trend for species preferring more ground cover	Increase in habitat trend.	Slight increase in habitat trend.
Habitat trend for species preferring less ground cover	Slight decrease in habitat trend.	Stable to slight decrease in habitat trend.

Environmental Effect	No Action	Proposed Action
Wetland habitat	Slight increase in wetland habitat quality.	Remain stable.
Population trend for species preferring more ground cover	Increase in population trend.	Populations would remain stable.
Population trend for species preferring less ground cover	Slight decrease in population trend.	Populations would remain stable.
Pronghorn movement	No fence removal, no change from current condition.	Improved pronghorn movement with 1.6 miles of fence removed.
Pronghorn forage	Remain stable.	Remain stable.
Pronghorn fawning habitat	Slight increase in pronghorn fawning cover.	Stable to slight increase in pronghorn fawning cover.
Heritage		
Heritage resources	No adverse effect.	No adverse effect.
Economic and Social		
Maintenance of ranching lifestyle	No	Yes
Dispersed recreation	Minor positive and negative effects.	Minor positive and negative effects.
Annual receipts to the Government (grazing fees)	None	\$2,403
Average annual cost to the Government	\$4,782	\$9,885

Chapter 3 - Environmental Effects

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for the comparison of alternatives presented in the charts above.

Range Vegetation

Affected Environment

The Spitz Hill Allotment is dominated by a ponderosa pine forest community (66%). Other vegetative communities present include prairie grasslands (15%), mixed conifer forest (17%), and mountain grasslands (2%). The Sitgreaves Allotment is also dominated by a ponderosa pine forest community (64%). Other vegetative communities present on the Sitgreaves Allotment include prairie grasslands (29%), mixed conifer forest (4%), mountain grasslands (2%), and pinyon-juniper woodland (1%). Dominant grass species on both allotments include blue grama, Arizona fescue, mountain muhly, pine dropseed, and bottlebrush squirreltail. Common shrub and herbaceous species include rabbitbrush, broom snakeweed, ceanothus, pussy toes, sandwort, globemallow, and buckwheat.

Differences exist between the potential natural community and the existing vegetation as the result of tree encroachment. Juniper, pinyon, and ponderosa pines have encroached into once productive grasslands, competing for available nutrients, moisture, and sunlight. This trend has been attributed to a combination of climatic shifts, control of fire, and grazing (Jameson 1987; Tausch and West 1994). As tree encroachment continues, overstory cover would increase, resulting in a corresponding decrease in grass and forb production (Moore and Deiter 1992).

Duck Lake is an ephemeral wetland located in the project area, and has approximately 80 acres classified as wetland. Approximately 62 acres (78%) of this ephemeral wetland was fenced to exclude livestock in 1989. Of the 18 acres that are accessible to livestock, approximately 10 acres are located within the Buggy Wheel Pasture of the Sitgreaves Allotment and approximately 8 acres are located in the Spitz Hill Pasture of the Spitz Hill Allotment. A stock tank (constructed in 1938) is located within the ephemeral wetland that is accessible to livestock on the Sitgreaves Allotment.

Livestock grazing has occurred within the project area since the late 1880's. Permitting began around 1905 with the establishment of the National Forests. No specific documentation is available regarding the type and number of livestock grazed in those early years, but general historic observations indicate that livestock numbers were high.

Forest Service records indicate that since 1947 the Spitz Hill Allotment has been a cattle allotment with a seasonal use period from May/June through October. Cattle numbers have varied from a high of 337 head in 1955 to none in 1992. The current permitted numbers were established in 1988 and the current permittee has held the permit for this allotment since 1994.

On the Sitgreaves Allotment, records indicate that since 1953 the allotment has been grazed seasonally with a use period from May/June through October. From 1953 to 1971, the Sitgreaves Allotment was a sheep allotment. The highest number of sheep (2,499 head) occurred on the allotment in 1959 and permitted numbers were set at 2,468 sheep in 1962. In 1972, the allotment was converted to a cattle operation with a permitted number of 350 adult cattle or 525 yearling

cattle. The current permitted numbers were established in 1987 when the current permittee acquired the allotment.

Current Management

Spitz Hill Allotment

The current permit for the Spitz Hill Allotment authorizes 195 adult cattle with a season of use from June 1 to October 16. This permitted use equates to 885 Animal Unit Months (AUM's). Actual use on the Spitz Hill Allotment over the past eleven years is shown in Figure 4. Actual use averaged 79% of permitted numbers from 1994 to 2001 with reductions in stocking level primarily in response to operational requirements and dry years. During the drought from 2002 to 2004, actual use was reduced, averaging 56%. Although 2005 was a fairly favorable precipitation and forage production year, actual use is being managed below permitted use to provide for plant recovery from the 2002-2004 drought.

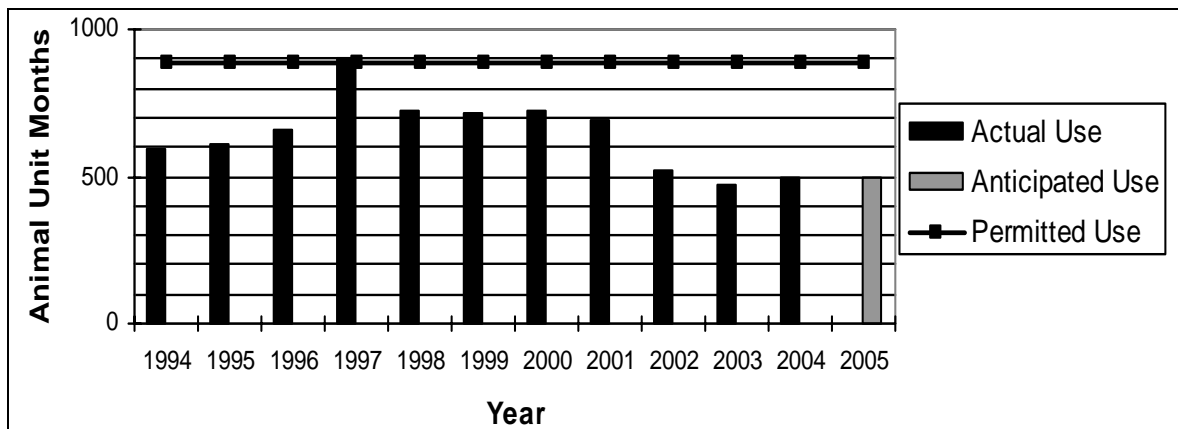


Figure 4. Actual, permitted, and anticipated use on the Spitz Hill Allotment, 1994 to 2005.

The Spitz Hill Allotment is divided into five main grazing pastures and one smaller shipping pasture. The grazing system currently used is a four pasture deferred-rotation system, with the Curry and Randall Pastures being used together as one pasture. The objective of this grazing system is to provide spring growing season deferment from livestock grazing to each pasture three years out of every four. The smaller pasture is used for ten to fifteen days in October for shipping cattle.

Sitgreaves Allotment

The current permit for the Sitgreaves Allotment authorizes 486 yearling cattle with a season of use from June 1 to October 15. This permitted use equates to 1,531 Animal Unit Months (AUM's). Actual use on the Sitgreaves Allotment over the past twelve years is shown in Figure 5. Actual use averaged 84% of permitted numbers from 1993 to 2001 with reductions in stocking level primarily in response to operational requirements and dry years. During the drought, 2002 to 2004, actual use was reduced and averaged 5%. Although 2005 was a fairly favorable precipitation and forage production year, actual use is being managed below permitted use to provide for plant recovery from the 2002-2004 drought.

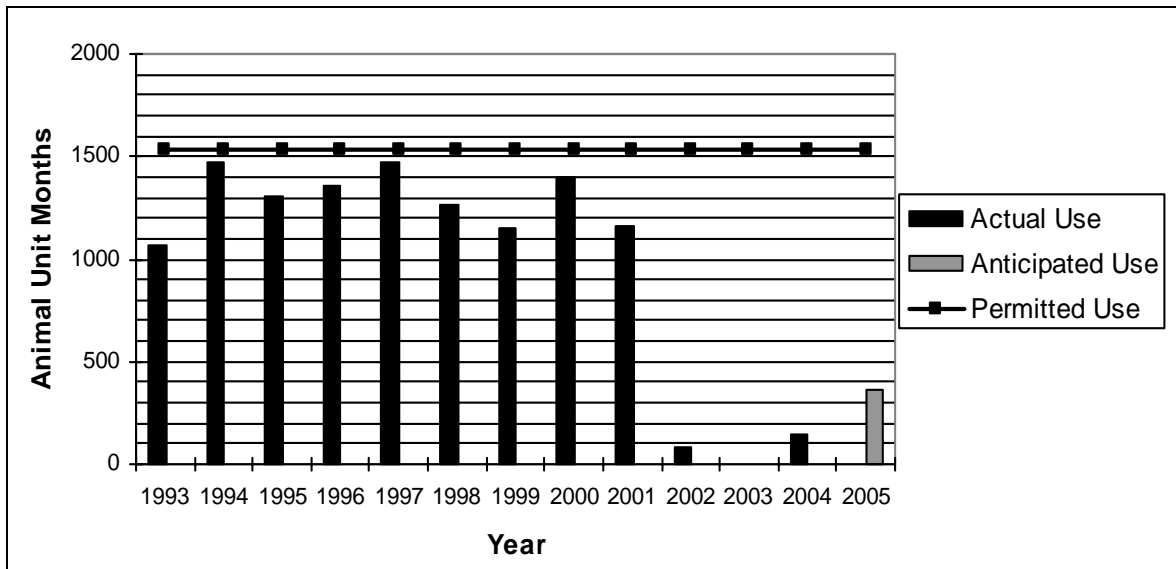


Figure 5. Actual, permitted, and anticipated use on the Sitgreaves Allotment, 1993 to 2005.

The Sitgreaves Allotment is divided into three main grazing pastures and two smaller holding pastures. The grazing system currently used is a three-pasture deferred rest-rotation system. This system uses two pastures each grazing season and rests the third. Seasonal deferment is also provided so that each pasture only receives spring growing season use from livestock one year out of three. The smaller holding pastures are typically used for gathering, working, and shipping livestock at the beginning and at the end of the grazing season.

Drought Management

Climate in the Southwestern United States is highly variable with periods of below average precipitation and drought being relatively common. Management of livestock during these periods is extremely important in order to protect soils, long-term site productivity, water quality, wildlife, and other Forest resources and activities. To address this issue, the following guidelines were established for the Williams and Tusayan Districts of the Kaibab National Forest:

- Annual monitoring and evaluation of precipitation and forage conditions.
- Annual adjustment of authorized livestock numbers to match the current year's forage production and conditions. Authorized livestock numbers will not exceed the maximum permitted livestock numbers. Required or voluntary reductions in livestock numbers will be documented as non-use for range improvement purposes, not for personal convenience.
- Livestock use of a pasture will only be authorized when the current year's forage production exceeds 100 pounds (dry weight) per acre within the key areas of the pasture. If there are no pastures on the allotment that meet this criterion, grazing will not be authorized on the allotment.
- The grazing management strategy that is established on the allotment (rest-rotation, deferred rotation, etc.) will be maintained.
- The utilization standards established for the allotment will be maintained and enforced. In cases of severe drought, and during severe drought recovery periods, the established utilization standards may be reduced.

- Permittee may be required to haul water to portable troughs to avoid depleting existing water sources.
- Following severe drought, re-stocking to full capacity will not occur until after a minimum of one growing season of rest. Generally, re-stocking the allotment following severe drought will occur incrementally over several years.

Range Condition and Trend

The Forest Service has been using the Parker Three-Step Method to evaluate condition and trend of rangelands since 1954. This method is the basis of one of the longest records of apparent vegetation changes on national forests. Livestock grazing affects the vegetation and soil, and this method is one technique to evaluate what impacts are occurring over time. Paced transects are another method used to supplement information on range condition and trend. They help to delineate vegetation condition classes and provide additional data on composition, vigor, cover, and soil conditions over the larger area.

Data from the range clusters is scored; based on that score, a descriptive condition is assigned (very poor, poor, fair, good, and excellent). The rating is a relative index that represents the composition, density, and vigor of the vegetation and the physical characteristics of the soil. Range trend expresses the direction of change in range condition over time in response to livestock management and other environmental factors.

These methods used to evaluate range condition and trend are generally considered a process for determining range condition and trend relative to the land’s value for grazing livestock, and does not provide information of ecological status (USDA 1997). As such, there is not a direct correlation between range condition class and ecological condition; an area could be in a poor or fair condition simply because the area has a low value for livestock grazing.

Spitz Hill Allotment

Permanent Parker 3-step cluster and pace transects were established on the Spitz Hill Allotment in 1957. Based on the data collected in 2004, the allotment is in a “fair” condition class, with a stable to slightly downward trend. Table 7 shows the range condition and trend determinations for each monitoring location.

Table 7. 2004 Range condition and trend determinations for the Spitz Hill Allotment.

Location	Condition	Trend
C1	Fair	Stable
C2	Fair	Down
C3	Fair	Stable/Down
C4	Fair	Stable/Down
P3	Poor	Down
P5	Poor	Stable
P6	Fair	Down
P9	Fair	Down
P10	Fair	Stable/Down
P11	Good	Up

Note: C = Parker Three-Step clusters; P = Pace Transect sites

Sitgreaves Allotment

Permanent Parker 3-step clusters and pace transects were established on the Sitgreaves Allotment in 1957. Based on data collected in 2004, the allotment is in a “poor” condition class with a stable to slightly upward trend. Table 8 shows the range condition and trend determinations for each monitoring location.

Table 8. 2004 Range condition and trend for Sitgreaves Allotment.

Location	Condition	Trend
C1	Fair	Up
C2	Poor	Stable/Up
C3	Poor	Stable
C4	Poor	Up
C6	Poor	Up
P1	Poor	Stable
P2	Poor	Stable/Down
P3	Poor	Stable/Up
P4	Poor	Stable/Up
P5	Fair	Stable

Note: C = Parker Three-Step clusters; P = Pace Transect sites

Changes in the density and diversity of cool-season perennial grasses are important factors in evaluating range condition and trend. On both allotments, impacts from the 2000-2004 drought period are believed to be a significant factor in the loss of cool season grasses and, as a result, a decline in range condition and trend. This is supported by Parker Three-Step Cluster data from a relic area that has never been exposed to livestock grazing. Data collected from this site in September, 2003 shows similar declines in cool-season grasses and a decline in range condition and trend (D. Brewer, personnel communication). On the Spitz Hill Allotment, it is also believed that two Parker Three-Step Clusters in the Government Prairie area show a decline in range condition and trend due to the prescribed burn that occurred in the area in the fall of 2003. While low intensity fire provides several benefits important to the maintenance and functioning of grassland communities, adequate recovery time is required post-burn to restore plant health and vigor. Plant recovery in this area was slowed by the drought conditions that existed prior to the burn and by below average precipitation conditions that existed in the area following the prescribed burn.

Grazing Capability and Grazing Capacity

An analysis of grazing capability and grazing capacity was conducted on both allotments in 2004. Grazing capability of a land area is dependent upon the interrelationship of the soils, topography, plants and animals. Grazing capability is used to determine which acres will contribute to the forage producing base for determining grazing capacity. It is expressed as one of three classes:

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 are on slopes less than 40%. See Table 9 for Full Capacity classification acres on these two allotments.

Potential Capacity (PC) – areas that could be used by grazing animals under proper management but where soil stability is impaired, or range improvements are not adequate under existing conditions to obtain necessary grazing animal distribution. Grazing capacity may be assigned to these areas, but conservative allowable use assignments must be made. See Table 9 for Potential Capacity classification acres on these two allotments.

No Capacity (NC) – areas that cannot be used by animals without long-term damage to the soil resource or plant community, or are barren or unproductive naturally. In addition, it includes areas that produce less than 100 pounds per acre of forage and/or are on slopes greater than 40%. Grazing capacity is not assigned to sites with a “no capacity” classification. See Table 9 for No Capacity classification acres on these two allotments.

Table 9. Grazing capacity acres on Spitz Hill and Sitgreaves Allotments.

Capacity Class / Allotment	Spitz Hill Allotment (acres)	Sitgreaves Allotment (acres)
Full Capacity	9,763	15,128
Potential Capacity	2,906	4,342
No Capacity	1,041	940

Grazing capacity is the average number of livestock and/or wildlife which may be sustained on a management unit compatible with the management objectives. It is a function of grazing capability, forage production, proper use by livestock, and the level of management that may be applied. The analysis used forage production and grazing capability to determine the estimated grazing capacity. Forage production measurements and estimates were taken from each Terrestrial Ecosystem Survey (TES) unit within the allotments. Depending on the vegetative community, an allowable use standard of either 35% or 40% was used on the Full Capacity acres within both allotments. An allowable use standard of 20% was used for all Potential Capacity acres within both allotments. Areas within each allotment that were classified as No Capacity were not considered in the estimate of grazing capacity.

This analysis showed that permitted livestock are utilizing about 20% of the total forage produced on the Spitz Hill Allotment and about 28% of the total forage produced on the Sitgreaves Allotment (Table 10). It also shows that the current and proposed permitted livestock numbers are within the estimated grazing capacity of these allotments.

Table 10. Forage production, grazing capacity and forage required by permitted livestock.

	Spitz Hill Allotment	Sitgreaves Allotment
Forage Required by Permitted Livestock	708,000 pounds (885 AUM's)	1,224,800 pounds (1,531 AUM's)
Estimated Grazing Capacity Calculated on FC and PC acres with established utilization standards	1,116,000 pounds (1,395 AUM's)	1,341,600 pounds (1,677 AUM's)
Total Allotment Forage Production Calculated on FC, PC and NC acres	3,525,600 pounds (4,407 AUM's)	4,416,000 pounds (5,520 AUM's)
Percent Forage Required of estimated grazing capacity	63.4%	91.3%
Percent Forage required of total allotment forage production	20.1%	27.7%

Note: Animal Unit Month (AUM) is defined as the amount of forage required by an animal unit for one month; approximately 800 pounds/AUM (Manske 1998).

On both allotments, areas of full capacity rangeland have been reduced through a steady encroachment of ponderosa pine and pinyon-juniper trees into grassland areas. While the current and proposed permitted livestock numbers are within the carrying capacity of the allotments, tree encroachment would have the effect of reducing grazing capacity in the future. Although this proposed action does not include tree encroachment control activities, the District has planned and implemented several separate, concurrent tree encroachment control projects within and adjacent to the allotments.

Utilization

Utilization is the proportion or degree of current year's forage production that is consumed or destroyed by animals. Measurements and estimates of utilization require a comparison of the amount of herbage left compared with the amount of herbage produced during the year. As such, measurements and estimates of utilization must occur at the end of the growing season. Seasonal utilization is the amount of utilization that has occurred before the end of the grazing season.

Utilization standards (allowable use standards) have been established for key areas in all pastures on both allotments and apply to utilization levels at the end of the growing season. The established utilization standards vary slightly by vegetative community and other resource considerations. On the Spitz Hill Allotment, the current and proposed allowable use standards are 40% in the prairie grasslands, 35% in the ponderosa pine/mountain grasslands, and 20% in the upland portions of all vegetative communities and in Mexican Spotted Owl habitat. On the Sitgreaves Allotment, the current and proposed allowable use standards are 35% in all vegetative communities and 20% in the upland portions of all vegetative communities and in Mexican Spotted Owl habitat.

Annual and seasonal utilization monitoring are conducted regularly on both allotments. Utilization monitoring is conducted at the end of the growing season to ensure compliance with the established utilization standards. Seasonal utilization and grazing intensity monitoring is conducted during the grazing season and is used as a guideline for moving livestock within the allotments and considers season of use, potential for additional forage growth, wildlife use, climate conditions, availability of forage, and water in pastures. Annual allowable and seasonal utilization data, range condition and trend and climate information is used together to assess stocking levels and pasture rotations for future years.

On the Kaibab National Forest, the established utilization standards have been used as the target for both annual utilization and seasonal utilization. As a result, monitoring records for utilization on these allotments is typically a record of seasonal utilization. The exception would be utilization monitoring records from monitoring conducted at or near the end of the growing season (September/October).

From 2000 to 2004, annual utilization and seasonal utilization records indicate that the utilization standards established for the Sitgreaves Allotment were not exceeded (PR# 43). For the same time period, records indicate that the utilization standards established for the Spitz Hill Allotment were exceeded one time in one pasture. Namely, in 2000, the seasonal utilization in the Spring Valley Pasture was recorded at 40% in the key areas, exceeding the utilization by 5% (PR# 43).

Direct and Indirect Effects on Range Vegetation

Meteorological conditions (precipitation, temperature, and wind) are likely the single most important factor in evaluating and predicting effects on rangeland vegetation. For this analysis, long-term average meteorological conditions are assumed to prevail over the analysis area.

Alternative 1 – No Action

Livestock grazing would not be permitted in the analysis area, so no effects from livestock grazing would occur. Under the no action alternative, range condition would be expected to improve slowly over the next ten years and then stabilize. Range trend is expected to be upward during the period of improving range condition (approximately 5 to 10 years) and would be followed by a period of stable, or no apparent trend (Courtois et al. 2004).

Plant species diversity, herbaceous cover, perennial grass cover, and density of cool-season grasses would be expected to slightly increase over a period of several years and then stabilize. The increases in these four factors would be most noticeable, and occur most rapidly, in the more mesic environments (<15% of analysis area acres). Within the drier environments (approximately 85% of analysis area acres), these changes would likely occur more slowly. Improved herbaceous cover could result in more frequent, low intensity fires which would promote nutrient cycling and the maintenance of healthy grassland communities.

Forage production and forage quality are expected to have a short-term increase (years 1 to 3), followed by a period of stabilization and then declining (years 5+). Forage production and quality is maintained and enhanced by light to moderate livestock grazing (Holechek, 1981). The lack of light to moderate livestock grazing would result in decadence and reduced palatability of forage plant species. Wildlife would continue to graze within the project area. However, because wildlife use is typically patchy, forage production and quality would not be maintained over the entire project area.

Herbaceous forb cover and density is predicted to be stable in the first five years, followed by a declining period (Loeser et al. 2005). Generally, herbaceous forb species are early seral stage species that depend on disturbance to maintain their populations. Without regular disturbance, normal succession would result in a decrease in herbaceous forb cover and density over time.

Alternative 2 – Proposed Action

Spitz Hill

Under the proposed action, there would be a change from a four-pasture, deferred-rotation grazing system to a five-pasture, deferred-rotation grazing system on the Spitz Hill Allotment. This would reduce the grazing periods in the Randall Pasture (from 45 days to 15 days) and in the Curry Pasture (from 45 days to 30 days). This would improve cattle distribution, reduce the potential for grazing the regrowth of important cool-season grasses, and provide additional recovery time to the pastures.

Five new water developments are proposed on the Spitz Hill Allotment; two in the Spring Valley Pasture, two in the Spitz Hill Pasture, and one in the Sawmill Pasture. Vegetative cover and species diversity would be negatively impacted in the areas immediately surrounding the five proposed water developments. With the improved livestock distribution that is expected as a

result of these water developments, it is predicted that vegetative conditions would improve within pastures and the allotment as a whole. This improvement over the larger area would compensate for the small areas of reduced vegetative condition.

Approximately 0.8 miles of existing fence is proposed for removal and approximately 0.1 mile of new 4-wire fence (smooth bottom wire) would be constructed. The proposed fence construction and removal would have insignificant, short-term trampling effects to the vegetation in the immediate vicinity of the activity.

Sitgreaves

The Sitgreaves Allotment would be changed from a three-pasture, deferred rest-rotation grazing system to a three pasture, deferred-rotation grazing system. This would reduce the grazing periods in the three pastures from approximately 65 days to approximately 38 days. This would improve cattle distribution, reduce the potential for grazing the regrowth of important cool-season grasses, and provide additional recovery time to the pastures. There would be no change to the amount of spring growing season deferment each pasture would receive; deferment would still occur two years out of every three. The loss of the benefits of resting a pasture would be offset by the improvement of the allotment overall.

Approximately 1.6 miles of existing fence is proposed for removal. The proposed fence removal would have insignificant, short-term trampling effects to the vegetation in the immediate vicinity of the activity.

Both Allotments

As a result of the improved cattle distribution, reduced grazing of cool-season grasses, and additional recovery time to pastures, range condition is expected to improve slowly over the next ten years and range trend is expected to be upward during this period. With normal to above normal precipitation, the cool season grass component should increase by 20% over the next ten years.

Plant species diversity, herbaceous cover, perennial grass cover, and density of cool-season grasses are expected to slightly increase over a ten year period and then stabilize. The increases in these four factors would be most noticeable, and occur most rapidly, in the more mesic environments (<15% of analysis area acres). Within the drier environments (approximately 85% of analysis area acres), these changes are predicted to occur more slowly. Improved herbaceous cover could result in more frequent, low intensity fires which would promote nutrient cycling and the maintenance of healthy grassland communities.

The levels of forage production and forage quality are expected to be stable to slightly increasing. Forage production and quality would be maintained and enhanced by periodic defoliations (Holechek 1981). Herbaceous forb cover and density is predicted to be stable to slightly increasing. Livestock grazing would provide the disturbance necessary to maintain the herbaceous forb component of the vegetative community.

Cumulative Effects

Because the focus of this analysis is on range resources, which receive very little influence from off-site activities, the geographical extent of this cumulative effects analysis is confined to the

Spitz Hill and Sitgreaves Allotments. Past and ongoing uses and actions within the analysis area that could affect range condition and trend and the overall grass and forb component within the allotments include tree thinning, prescribed burning, dispersed recreation, and off-road vehicle travel. Except for the off-road vehicle travel, all of these uses are expected to continue indefinitely into the future. A 25-year timeframe was selected for this cumulative effects analysis, 1995-2020 (10 years past + 10 years authorized grazing+ 5 years post). This timeframe was selected because the effects from vegetative treatments and prescribed burning on range resources are believed to occur for about ten years; the proposed action would authorize a ten-year grazing permit; and the effects of the proposed action would last about five years.

Past, present, and foreseeable future vegetative treatment projects in the analysis area include the R-S Hill, Government Hill, Spring Valley #5, Wright Hill, Pineaire, and Parks West vegetative treatment projects (approximately 11,850 acres) and the TO Tank and Buggy Wheel grassland maintenance projects (approximately 970 acres). Projects that thin small and medium-diameter trees may have negative short-term effects associated with mechanical activity and soil disturbance, but over the long-term they increase the available light, nutrients, and moisture for grass and forb species, resulting in an improved forage and rangeland condition.

Past, present, and foreseeable future prescribed burning projects in the analysis area include slash pile and broadcast burning of all vegetative treatment project areas and slash pile burning within the grassland maintenance project areas. Additionally, a prescribed fire plan has been implemented for the Government Prairie grassland within the analysis area (approximately 1,775 acres). Prescribed fire in this area is planned on a five to seven year frequency with the most recent prescribed fire in the analysis area being completed in the fall of 2003. Prescribed fire increases nutrient availability thereby stimulating herbaceous vegetation production and improving vegetation quality. Prescribed fire also helps maintain grassland communities by killing young trees that are encroaching into grassland communities. While low-intensity fire provides multiple benefits, it usually takes one growing season of recovery time to restore plant health and vigor.

Dispersed recreation and off-road travel can damage vegetation and compact soils. Compacted soils absorb and retain less water than aerated soils resulting in reduced vegetative growth of grass and forb species. Although dispersed recreation occurs throughout the analysis area, vegetative damage and soil compaction is generally confined to areas immediately around roads. These limited impacts result in only minor negative effects to rangeland condition on a small portion of the allotments.

The net positive effects of these past, present, and foreseeable future projects; would result in an overall positive effect on range condition and trend. The net direct and indirect effects of the proposed action would also have a positive effect. This would result in a cumulative effect of an increased rate of improvement of the vegetative resource within the analysis area, over the next 15 years.

Soils and Watershed

Existing Condition

The Spitz Hill and Sitgreaves Allotments are primarily level-to-moderately sloping plains. Approximately 25% of the area is moderately sloping-to-steep cinder cones and escarpments.

The Spitz Hill and Sitgreaves analysis area overlaps the junction of three 5th code watersheds: Sycamore Creek, Spring Valley Wash, and Cataract Creek. Sycamore Creek ultimately drains to the Verde River, while Spring Valley Wash and Cataract Creek drain to Havasu Creek. Smaller watersheds within the 5th codes have been delineated for this project, in order to more specifically identify the effects of the management alternatives. These are Red Lake Wash, South Cataract Canyon, and Kaibab Lake, which contribute to the Cataract Creek watershed; Marteen Tank, which contributes to the Spring Valley Wash watershed; and Scholz Lake, which contributes to the Sycamore Creek watershed. Maps of the 4th, 5th, and sub-5 code watersheds are located in the project record (PR# 46).

Soils throughout the project area are derived from volcanic minerals (basalt, cinders, ash, andesite, dacite, rhyolite, and trachyte). The very flattest sites (0% - 5% slope) possess alluvial soils that formed from materials originating in other parts of the watershed and transported by water or wind. The bulk of the project area has soils that formed in place as minerals weathered and decomposed.

Cryptobiotic soil crusts are poorly developed in the project area; abundant litter from grasses and trees prevent establishment. Freeze/thaw and wet/dry regimes cause the soil surface to be too dynamic to support crust formation. Soil surface cryptogams are present, but they do not form crusts that are damaged by hoof impacts. Lichens and other cryptogams are plentiful on rock surfaces. Cattle avoid rocky areas, so there is little or no impact of grazing on crusts on rocky substrates.

There are no perennial streams or water bodies within the allotment boundaries. There are a number of constructed water tanks for livestock and wildlife use, fed by ephemeral drainages and overland flow. None of these provide year-round water. Due to the lack of perennial water sources, there are no riparian areas. Duck Lake is an ephemeral wetland. A constructed dike on the west end of the lake confines water to the basin in most years, but water may flow out in extremely wet years. The basin is saturated often enough that the soil has hydric properties and can support seasonal obligate and facultative wetland plant species (*Eleocharis*, *Scirpus*, *Cyperus*, and *Polygonum sp.*). After the upper horizon of the soil dries, mesic, mostly annual, vegetation also develops.

A waterfowl habitat improvement project in 1989 created deeper channels and nesting islands in the wetland. The channels probably hold water longer than the unmodified surface did. The islands likely support more “dry land” vegetation than the unmodified wetland. The effects of these modifications on the wetland’s function are unclear, but they do not appear to be compromising the wetland’s functionality or sustainability.

A stock tank was constructed on the northwest edge of the wetland in 1938. The surface area of the tank is 0.4 acres, one-half percent of the wetland’s 80 surface acres. Most of the runoff that enters the wetland comes from the northeast, east, and southeast, filling the majority of the wetland before reaching the tank. Runoff that is captured by the tank comes from the northwest, a tiny portion of the wetland’s watershed. The bottom of the stock tank is dense clay, which prevents water from wicking from the wetland substrate into the tank or from the tank into the wetland soils. Water persists longer in the tank than in the surrounding wetland. This is due to its lower surface to volume ratio, which decreases the rate of evapo-transpiration relative to the wetland’s higher surface to volume ratio. Due to the water depths in the Duck Lake stock tank over the past eight months, the District has been unable to calculate the tank volume.

Calculations on how long the amount of water in a stock tank persists in the tank vs. the surrounding wetland have been done for similar tanks at Davenport and Dry Lake (which are on an adjacent allotment). Under the assumption that the surface to volume ratio is similar, it is estimated that unimpounded tank water could prolong wetland water for as long as 4.5 days in cool months to as little as 10 hours in hot dry months (USDA 2004b). Given that water flowing into the tank is a miniscule portion of the water flowing into the wetland and that impounding that water makes no meaningful difference in the wetland's inundation period, the concern that livestock consumption of tank water impacts the wetland is unfounded.

Executive Order 11990 requires that each federal agency “provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency’s responsibilities for ... managing ... Federal lands and facilities, ... and conducting Federal activities and programs affecting land use” (Section 1.a.).

Duck Lake fits the definition of “wetlands” as used in Executive Order 11990 (May 24, 1977, 42 FR 26961, 3 CFR, 1977 Comp., p. 121):

“those areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.”

However, Section 8 states that the Order does not apply to projects completed prior to October 1, 1977. The Duck Lake tank was constructed in approximately 1938. Therefore, E.O. 11990 does not require that they be re-evaluated for the effect of their continued existence and maintenance on “the survival and quality of the wetlands” (Section 5). The Forest Service proposes only to maintain, not to increase the surface area or depth, of the Duck Lake stock tank.

There are two perennial waters in the sub-5 watersheds, outside the allotments, that are affected by grazing management on Sitgreaves and Spitz Hill Allotments: Scholz Lake and Kaibab Lake. Water quality and quantity in both lakes are important for maintaining their recognized recreation and wildlife values. Kaibab Lake is also a component of the City of Williams water supply system. The drainages between the allotments and the lakes are nearly flat and extremely ephemeral. The drainages are well-vegetated, which facilitates water infiltration into the soil, decreasing runoff. It also decreases the amount of sediment produced and decreases the distance sediment moves.

When the potential rate of erosion exceeds the tolerance rate, soils are at risk of experiencing long-term loss in productivity. Approximately 26% of Sitgreaves and 27% of Spitz Hill have soils that are at risk of sheet, rill, and gully erosion, particularly if vegetative ground cover is removed (PR# 46). Soils on slopes greater than 15% with high cinder contents are inherently unstable. All of the high risk areas on both allotments are on slopes of 15% – 80%. These slopes generally avoided by cattle, as they prefer to use flat to gently sloping terrain. Sitgreaves Mountain, Bald Mountain, and Frenchy Hill on Sitgreaves Allotment and Sitgreaves Mountain, Government Hill, and Wright Hill on Spitz Hill Allotment are the primary locations for these soils. The Sitgreaves Allotment currently has a predicted average soil loss rate of 0.8 tons/acre/year (t/a/y). Spitz Hill Allotment currently has a predicted average soil erosion rate of 0.7 t/a/y. The predicted average potential soil loss rate, which could occur if all vegetation and

litter were removed, is 4.0 t/a/y on Sitgreaves and 4.6 t/a/y on Spitz Hill. The erosion tolerance level, which is the highest rate at which soil can be lost without long-term loss of productivity, on both allotments is 2.6 t/a/y.

In some soils, the current erosion rate is likely to already be exceeding the tolerance rate. When this is the case, hydrologic condition is considered to be unsatisfactory. According to the Terrestrial Ecosystem Survey (TES), soils in the Sitgreaves and Spitz Hill project areas that may be unsatisfactory occupy approximately 1366 and 186 acres, respectively (7% and 1% of each allotment). Not coincidentally, these are most of the same acres that have a severe risk of erosion. All the soils at risk of unsustainable erosion occur on slopes greater than 15%. These slopes are generally avoided by cattle, which prefer to stay on flat to gently sloping terrain.

Soil condition on range allotments is monitored and evaluated as part of the range condition and trend monitoring protocol. The score is heavily influenced by the amount of litter cover and bare soil present and by signs of sheet or rill erosion. Data collected in 2003 and 2004 show that Sitgreaves Allotment's soil condition is rated as good. Trend is upward, based on decreases in the amount of bare soil and increases in the amount of litter. On Spitz Hill, soil condition is good to excellent. The trend is upward. The amount of litter increased at all four monitoring sites; the amount of bare soil decreased on three of the four monitoring sites. One site had a slight increase in bare soil, from 11% to 14%. All sites have less bare soil than when monitoring began in 1962.

Direct and Indirect Effects of Alternatives on Soil and Watershed Values

To compare alternatives, effects are described using trend in soil condition or its components of nutrient cycling, hydrologic function and site stability.

Alternative 1- No Action

Results are the same for both allotments. Vegetative basal area, herbaceous canopy cover, and litter cover would slowly increase in some areas. This would lead to a decrease in surface water runoff, thereby reducing soil erosion. Increased water infiltration would lead to increased plant vigor and cover, and likely improve nutrient cycling. There would be some decrease in soil compaction around heavily used areas such as stock tanks. Wildlife would continue to utilize forage and watering sites, so current impacts would not immediately or completely vanish. While soil condition would slightly improve, the area's semi-arid climate would limit both its rate and extent.

The Duck Lake ephemeral wetland would remain fully functional. There would be no discernable change in the amount or type of wetland vegetation. There would be no discernable change in wetland extent or duration of inundation. If the stock tank is not maintained, it would gradually silt in, eliminating some amount of deep-water habitat. Water quality in Scholz and Kaibab Lakes would continue to support recreational, wildlife, and municipal values.

Alternative 2 - Proposed Action

The proposed change from a deferred rest-rotation to a deferred-rotation grazing system on Sitgreaves Allotment would decrease the number of days cattle would spend in each pasture. It would favor increased herbaceous cover and litter cover, which would enhance soil moisture retention. That would, in turn, enhance nutrient cycling.

On Spitz Hill, the proposed change from four pastures to five would decrease repeat grazing of individual plants. If constructing roadside pit tanks results in better cattle distribution, there would be a further decrease in repeat grazing. The resulting increase in plant vigor would likely have a small, but positive impact on soil and watershed conditions. The benefits are more likely to be expressed as improved health and resistance to climatic stress than as a meaningful increase in vegetative ground cover. This would ensure more consistent protection of the soil surface, preventing degradation, but is unlikely to provide a significant improvement in condition.

Cattle generally avoid slopes that are steep. Additionally, forage utilization is restricted to 20% in uplands and 35% to 40% in flatter areas. This assures ample standing vegetation at all times to protect soils from excessive erosion. Soil condition should continue to improve.

Mitigation measures that prevent grazing in the Duck Lake ephemeral wetland while the soils are wet prevent soil compaction and protect the wetland's fully functional condition. Grazing at the proposed levels would not change the type or amount of wetland vegetation. There would be no change in the extent of the wetland or in the duration of inundation. Water quality in Scholz and Kaibab Lakes would continue to support recreational, wildlife, and municipal values.

Cumulative Effects

The boundary for the cumulative impact analysis is the watershed that drains to Scholz Lake, Kaibab Lake, Marteen Tank, South Cataract Canyon, and Red Lake Wash. This comprises approximately 198,000 acres. These are the 5th-Code watersheds that the proposed action could potentially affect

The Terrestrial Ecosystem Survey has mapped 142,000 acres of the analysis area. All soil loss calculations are based on the mapped acres. The unmapped areas are state or private property. Land use (primarily livestock grazing and recreation, with pockets of residential development) and topography are similar between the different ownerships. Red Lake Wash and South Cataract Canyon sub-fifth code watersheds are each approximately half federal land and half other ownerships. Kaibab Lake, Marteen Tank, and Scholz Lake watersheds are primarily federal lands, affected mostly by recreation, timber and fuels management, and livestock-grazing activities.

Communities in the analysis area include Red Lake, Pineaire, Parks, Pittman Valley, Sherwood Forest, and Woods. Residential developments affect watersheds by increasing runoff and by creation of ill-sited, illegal roads on the Forest.

Grazing allotments in addition to Sitgreaves and Spitz Hill that are wholly or partially within the analysis area are Chalender, Government Prairie, Smoot Lake, Cowboy Tank, Squaw Mountain, Twin Tanks, Pine Creek, Government Mountain, Bellemont, Davenport Lake, Homestead, Elk Springs, Moritz Lake, Hat, and Juan Tank.

Cumulative effects of grazing prior to 1986, when data collection for the Terrestrial Ecosystem Survey (TES) was completed, are reflected in its' "current" erosion rates. The "current" rate is used as the baseline to determine impacts since 1986. Condition and trend monitoring on the allotments reveals effects of grazing on soil and watershed condition since then. If soil condition trend has been stable or upward, it is assumed livestock grazing is not causing significant negative impacts to soils or the watershed. On the 16 allotments in the cumulative effects analysis area, nine have upward soil condition trends, two are stable, one is downward, and four

have insufficient data to determine trend. The upward trend on the majority of soils in the analysis watershed more than offsets the downward trend on a single allotment.

While the cumulative effects analysis period begins in 1986, many ground disturbing projects that have been implemented since then are no longer affecting soils or watershed and are therefore no longer contributing to cumulative effects. Direct effects of projects and management activities are considered to persist for approximately three years after their completion. Three years is chosen because the Best Management Practices (BMPs) and mitigation measures that are part of each project are intended to prevent or remedy negative watershed impacts within three years. Projects are designed to have long-term beneficial watershed impacts that outweigh the short-term negative effects.

The cumulative effects analysis period ends in 2016. This is when grazing permits issued in 2006 would be terminated. The analysis period includes any other projects in the area that are active or in the 3-year recovery phase between 2003 and 2016. Not all the projects that are likely to occur near the end of the analysis period are known at this time. Because of this, the predicted cumulative soil erosion rates for about the last five years of the analysis period are likely lower than what will actually occur.

Vegetation and fuels management projects wholly or partially within the analysis area that are likely to overlap the Sitgreaves and Spitz Hill analysis period are Spring Valley, Frenchy, Pineaire, Government Prairie burns, Beacon, City, Marteen, Dogtown, Wright Hill, Government Hill, Wright Hill, Kendrick-Newman burns, Community Tank, Parks West, and Buggy Wheel grassland maintenance. Burning and mechanical disturbance associated with each of these projects would cause some increased soil erosion. The average soil loss rate on the Spring Valley Resource Area for example, is 0.9 t/a/y when there are no impacts from projects. The rate rises to 1.3 t/a/y. within active project areas, gradually returning to the non-impacted rate over the three-year recovery period.

The average background erosion rate within the 142,000-acre analysis watershed is 0.70 t/a/y. In the “worst case scenario” of all the projects going on at the same time, the cumulative erosion rate is predicted to be 0.72 t/a/y. Because the effects of grazing are already included in the background rate, there is no measurable cumulative effect of grazing on the watersheds. The average tolerance erosion rate for the analysis watershed is 2.6 t/a/y.

The Radio Hill Roads Analysis recommends closing up to 50 miles and obliterating up to 67 miles of roads in the analysis area. Roads are a major cause of soil erosion, due to their modification of natural water flow and infiltration patterns (Forman and Alexander 1998). The actual amount of erosion that would be prevented is unknown, but road closures and obliteration would have beneficial effects on the watersheds.

Livestock grazing would likely continue on all the allotments within the analysis watershed throughout the analysis period. Management changes in the future can be expected to increase control over the location and extent of use. These changes are expected to improve vegetative cover and watershed condition, causing a gradual decrease in the soil erosion rate.

Conclusion

Soil condition trend on the two allotments is stable to upward. Portions of each allotment may be experiencing excessive erosion, but the overall flatness of each sub-watershed prevents long

distance soil movement. The average soil loss is well below the long-term tolerance rate. Each of the management alternatives maintains or improves soil, wetland, and watershed condition.

Wildlife

Affected Environment

The rangeland environment within the Spitz Hill and Sitgreaves Allotments includes habitat for many wildlife species found in the ponderosa pine, ponderosa pine-Gambel oak, ponderosa pine-savannah, mixed conifer, pinyon pine-juniper, juniper-savannah forest types, and grasslands. In addition, the ephemeral Duck Lake on the Sitgreaves Allotment provides seasonal wetland habitat for a myriad of migratory birds. Approximately 78% or 62 acres of this seasonal wetland are fenced off to exclude cattle. Other stock tanks on the allotments including Pipeline, Poquette, Sawmill, Kaufman, Freds, Spitz, and Crowe Tanks may also be used by migratory birds and other wildlife species. To protect wetland habitat, Sawmill and Kaufman Tanks have had portions fenced off to exclude livestock.

For some wildlife species, habitat does not exist within the allotments and/or their range does not overlap with the allotments. See Appendix 5 for species excluded from this analysis and rationale. Some other species that predominantly use trees, snags, dense forests, rocks, and/or cliffs for nesting and feeding may incur very minor effects through potential indirect effects to food items that occur in habitats that incur little to no use by livestock. These minor effects would not result in changes to habitat or population trends. See Appendix 5 for species and rationale); these species will not be discussed further in this section.

Sensitive Species

Chihuahua savannah sparrows may occur in large grassland areas during the winter on the allotments. This species forages for insects, spiders, and seeds, particularly grass seeds, on the ground in grasslands (Ehrlich et al. 1988). Winter forage availability for this species on the Spitz Hill Allotment has been in a stable to slightly downward trend while on the Sitgreaves Allotment the trend has been stable to slightly upward.

Navajo Mountain Mexican voles prefer ponderosa-pine or pinyon-juniper savannah with dense carpets of grass or woody shrub cover. Grass cover on the Spitz Hill Allotment has been in a stable to slightly downward trend while on the Sitgreaves Allotment the trend has been stable to slightly upward. Woody shrub cover on the two allotments is stable.

Management Indicator Species (MIS)

The management indicator species (MIS) concept was developed for use in land-management planning and is based on the idea that monitoring population trends of selected species could allow assessment of the effects of habitat management on communities that include those species. The assumptions inherent in this approach include the following: a) the status of MIS will be reflected in the impacts of management activities at the Forest and the project level; b) changes in MIS populations can be assessed and tracked through time; and c) the changes are representative of overall ecosystem conditions. The selection of MIS, as described in the Federal Code of Regulations (36 CFR 219.19), may include the following: threatened or endangered plant and animal species identified on State and Federal lists; species with special habitat needs that may be

significantly influenced by planned management programs; species commonly hunted, fished, or trapped; non-game species of special interest; or other plant or animal species that may reflect management activities. Information on the status of MIS and their associated habitat at the Forest-level presented in this analysis comes from the Management Indicator Species for the Kaibab National Forest, October 15, 2003 (USDA-Forest Service 2003). The next version of the Kaibab MIS report will incorporate recently collected Forest-level monitoring data for MIS breeding birds. When analyzed, the distance sampling data will provide more Forest-specific population estimates for several MIS species (Noble, pers. comm. 2005).

Northern goshawks were selected as an MIS to represent the late-seral ponderosa pine habitat within the Forest, which would not be affected by either alternative and will not be discussed further. The goshawk is also listed as a Region 3 Forest Service sensitive species.

Both allotments provide foraging habitat for this species. Though goshawks in forest situations spend much of their time in areas with large, tall trees, they also use grassy openings, especially during the winter. Use of grassy openings is often related to the availability of prey in these locations. The most important goshawk prey item that occurs within grassy areas on the allotments is the eastern cottontail. The eastern cottontail prefers well-developed grass and shrub cover for food, nesting, and shelter.

There are five delineated nest areas and five post-fledging family areas (PFAs) within the two allotments. Goshawks have been seen within the allotments and monitoring of the nests has been conducted in the past (PR # 13). Population trends on the Forest appear to be stable, with possible increases on the North Kaibab Ranger District.

Pronghorn antelope were selected as an MIS to represent grassland habitat within the Forest. Government Prairie and the Fues Tank area provide important pronghorn habitat within the allotments for foraging, fawning, and nursing. Pronghorn also use other grassy areas and savannahs on both allotments during seasonal and daily movements.

Grass and shrub vegetation height is an important attribute of pronghorn habitat, especially during fawning and nursing. Vegetation should be high enough to provide fawns hiding cover from predators, but low enough to allow for good sighting distances, so that pronghorn can scan for, and detect predators. Based on work by Schuetze and Miller (1992) in central Arizona and Bright and van Riper (2001) in northern Arizona, pronghorn exhibit the following habitat preferences for fawning and nursing: 1) they prefer herbaceous vegetation (grasses and forbs) that is approximately 10-15 inches high on average, 2) they avoid areas with herbaceous vegetation that is <5 inches in average height, and 3) they avoid woody vegetation >20 inches tall, but preferred grassland microsites with shrub inclusions, including juniper scrublands. A shrub microsite component in grasslands likely provides better hiding cover without comprising doe sighting distance and site access. The presence of more than a few isolated shrubs may make fawn detection by predators more difficult.

Grass and shrub vegetation height, as well as the percent of grassland with shrub inclusions, within Government Prairie and the Fues Tank grassland were estimated during the spring/summer of 2005. Average grass height was 7 (range 1-15) and 5 (range 1-23) inches on Government Prairie and the Fues Tank grassland, respectively. Average shrub height was 3 (range 1-5) and 4 (range 1-9) inches on Government Prairie and the Fues Tank grassland, respectively. On Government Prairie, 0% of the area was estimated to consist of grassland with shrub inclusions,

while 10% of the Fues Tank grassland had grass-shrub inclusions. As a comparison, Garland Prairie, which has been used in several recent pronghorn fawning research projects as a high quality control site has grass and shrub heights that average 5 (range 1 - 14) and 12 (range 5-16) inches, respectively, during this same timeframe. Garland Prairie was estimated to consist of 10% grass-shrub inclusions. These pronghorn fawning areas have lower than preferred grass heights, and Government Prairie has a slightly lower habitat quality due to the absence of shrub inclusions. Herbaceous vegetation height that is important for pronghorn antelope fawning and nursing cover is also likely correlated with changes in grass cover and general range condition on the allotments. Therefore, herbaceous vegetation height has likely remained stable or slightly decreased on the Spitz Hill Allotment and stable to slightly increased on the Sitgreaves Allotment.

Proper nutrition of wild ungulates can have important influences on reproduction, and offspring survival and growth (Cook et al. 2003). Pronghorn antelope maintain their necessary nutrition levels by eating primarily high-nutrition forbs, as well as shrubs, especially during the winter (Yoakum and O’Gara 1990). Total grass consumption by pronghorn increases during spring and fall ‘green-ups’, but remains a small proportion (around 10%) of annual diets (Yoakum and O’Gara 1990). The percent cover of shrubs, forbs, and grasses was estimated during the spring/summer of 2005 on Government Prairie and the Fues Tank grassland. On Government Prairie, percent cover was 1%, 5%, and 72% for shrubs, forbs, and grass, respectively. On the Fues Tank grassland, percent cover was 12%, 14%, and 31% for shrubs, forbs, and grass, respectively. As a comparison, Garland Prairie has percent cover estimates during this same timeframe of 12%, 5%, and 62% for shrubs, forbs, and grass, respectively (Miller and Drake 2004). Therefore, Government Prairie appears to be similar for pronghorn forage and nutritional needs, when compared to the high-quality Garland Prairie site, and the Fues Tank grassland is estimated to provide higher quality nutrition.

Net-wire fences and railroad rights-of-way fences can be barriers to pronghorn movement (Ockenfels et al. 1994). In addition, barbed-wire livestock fences can impede movement, or injure or kill pronghorn if they are not constructed properly. Pronghorn seasonal and daily movement ability has been decreased over the past century with the construction of fences. In recent years, efforts have been made to minimize the impacts of fences by using design features or modifications that promote passage. Pronghorn typically pass under fences, and as a result a minimum lower strand height of 18-20 inches is recommended (Ockenfels et al. 1994), as well as a smooth bottom wire to reduce the potential for snagging and injury.

There are approximately 80 miles of fences within the Spitz Hill and Sitgreaves Allotments. There are some non-Forest Service net-wire fences within the allotments on private lands. The interior Forest Service fences on the Spitz Hill and Sitgreaves Allotments are four strands, some have a smooth bottom wire and some are barbed. During 2005, approximately 5 miles of interior fences were modified on both allotments to facilitate pronghorn movement. Modifications included raising the height of the bottom wire to 18-20 inches at locations where pronghorn passage was evident. Additionally, on fences shared with the Homestead and Davenport Allotments, PVC “crossings” were installed in many locations. Informal monitoring has shown that pronghorn and elk are using the modified crossings (PR# 14). Pronghorn movement capabilities within and around the allotments are fair, with fences impeding some movement, but modifications minimizing such impediments.

There are approximately 8,681 acres of grassland within the two allotments. On the Forest there are approximately 249,293 acres of grassland habitat. Forest-wide there appears to be a

generalized stable to upward trend in the abundance of grassland habitat, owing to removal of trees in identified grasslands and lower livestock rates on some allotments. Forest-level pronghorn trends were thought to be increasing in the MIS Report, though data from the Arizona Game and Fish Department (AGFD) for 2002 to 20004 suggests a slightly decreasing trend. There has been such large annual variations in the pronghorn populations that what appears to be trends may, in fact be spurious correlations (USDA 2003).

Cinnamon teal This species was selected to represent species using the late-seral wetlands within the Forest. Cinnamon teal are ground-nesting birds that prefer dense vegetative cover, 12 to 15 inches high, near water (most nests are within 75 yards of water, though they range from over water to 220 yards from water (Bellrose 1976). The cinnamon teal eats aquatic vegetative seeds, and also insects and snails. They may use stock tanks that are scattered around the allotments if water levels are adequate as well as seasonal wetland habitat at Duck Lake. The environments surrounding these waters are marginal for cinnamon teal nesting. In 2005, higher moisture levels have resulted in increased vegetation around waters. Although this has improved conditions, vegetation cover around waters is likely still below levels present prior to the past decade of drought. Ephemeral wetland habitat at Duck Lake provides seasonal habitat for this species, but it is only likely to support nesting during very heavy flooding periods, when water and lush grass cover last through the breeding season.

Arizona, and likely Forest, cinnamon teal population trends are stable according to the MIS report. Climate-caused impacts to this species may be difficult to separate from potential management impacts. There is one incidental sighting recorded of a cinnamon teal at Duck Lake and the lake has been monitored on occasion for waterfowl species (PR # 4).

Rocky Mountain elk- This species was selected to represent the early-seral stage of the ponderosa pine and mixed conifer habitats within the Forest, which are important for elk calving cover. These habitats would not be affected by either alternative and will not be discussed further. Elk prefer savannah and grassland habitats for foraging. Owing to high levels of dietary overlap between elk and cattle (53% similarity between spring elk and summer cattle and 97% between summer cattle and fall elk on the Coconino National Forest (Miller and Brock 1992), the current range condition and trend likely represents the condition and trend of foraging habitat for elk. Grass and forage cover on Spitz Hill Allotment has been in a stable to slightly downward trend, while on the Sitgreaves Allotment the trend has been stable to slightly upward.

This large ungulate has spread across the entire district since its introduction in 1913 to northern Arizona, after the extirpation of Merriam's elk in the late 1890s (Lee 1986).

The AGFD has been monitoring and managing population trends of this species on the District. On the Forest, population trends increased into the mid-1990s and have decreased slightly in more recent years, owing to management by Arizona Game and Fish that increased hunting permit numbers in order to reduce impacts from elk.

Turkeys were selected to represent species using the late-seral ponderosa pine habitat within the Forest, which would not be affected by either alternative and will not be discussed further. They also utilize edge habitat and smaller grassy openings within forest stands for foraging. Insects, oak mast, and seed heads from grasses and forbs are important food items. Grass and other vegetative cover around waters are important for turkey poults. They may use stock tanks that are scattered around the allotments as well as seasonal wetland habitat at Duck Lake.

The abundance of insects and seed heads from grasses have likely remained stable or slightly decreased on the Spitz Hill Allotment and on the Sitgreaves Allotment abundance of seed heads and insects have likely remained stable or slightly increased owing to better grass conditions. The condition of grass and other vegetative cover around waters depends largely on climate. In 2005, higher moisture levels resulted in increased vegetation around waters. Although this has improved conditions, vegetation cover around waters is likely still below levels present prior to the past decade of drought.

The AGFD has been tracking population trends of this species on the District. Turkey population trends within the Forest have shown an increasing trend.

Migratory Bird Species of Concern

Chestnut-collared longspurs and northern harriers may occur on the allotments only during winter or migration, while the ferruginous hawk, golden eagle, burrowing owl, prairie falcon, and Swainson's hawk may occur on the allotments year-round, and also may breed.

Burrowing owls and chestnut-collared longspurs prefer grasslands with less vegetative cover and vegetative heights < 2 and < 8-12 inches, respectively (NatureServe 2004). Habitat quality has likely remained stable or slightly increased on the Spitz Hill Allotment and stable to slightly decreased on the Sitgreaves Allotment.

Ferruginous hawks have mixed grass-cover preferences. This species hunts in open, short-stature grasslands, but nests on the ground in areas with substantial grass cover (Saab et al. 1995). Owing to grass cover changes, hunting habitat quality for this species has likely remained stable or slightly increased on the Spitz Hill Allotment and remained stable or slightly decreased on the Sitgreaves Allotment. Nesting habitat quality has likely remained stable or slightly decreased on the Spitz Hill Allotment and stable to slightly increased on the Sitgreaves Allotment.

Northern harriers generally prefer hunting habitats that promote adequate prey base, such as early successional, dense grasses (NatureServe 2004). Owing to grass cover changes, hunting habitat quality for this species has likely remained stable or slightly decreased on the Spitz Hill Allotment and remained stable or slightly increased on the Sitgreaves Allotment.

Golden eagles forage primarily in open grasslands, though the primary prey of this species in this area is the black-tailed jackrabbit, which is more abundant in shrublands where this species also forages (Saab et al. 1995). The nearest known golden eagle nest is within the Spitz Hill Allotment boundary and approximately 1 mile from the Sitgreaves Allotment boundary, putting the allotments well within the foraging areas for these birds. Some of the open grasslands have been encroached by trees, generally leading to reduced availability of foraging habitat for this species; however, increased tree encroachment also appears to have increased availability of prey habitat for the black-tailed jackrabbit on both allotments.

Prairie falcons are strongly dependent on populations of their primary prey, ground squirrels. Ground squirrels uniformly prefer early successional, short-stature, dense grasses (NatureServe 2004). Owing to grass cover changes, hunting habitat quality for this species has likely remained stable or slightly decreased on the Spitz Hill Allotment and remained stable or slightly increased on the Sitgreaves Allotment.

Swainson's hawks prefer open, short-stature grassland with scattered trees for hunting and nesting (Latta et al. 1999). They prey on mammals, especially young ground squirrels and pocket gophers, as well as insects. The presence of grass cover is likely important to most of these prey species. Owing to grass cover changes, hunting habitat quality for this species has likely remained stable or slightly decreased on Spitz Hill Allotment and remained stable or slightly increased on the Sitgreaves Allotment.

Local Species of Concern

Gunnison's prairie dogs prefer open grasslands and short shrublands, with low vegetation (Boddicker 1983) and less grass cover. Prairie dogs are found on the Spitz Hill Allotment and there are unoccupied colonies found on the Sitgreaves Allotment. Owing to grass cover changes, habitat quality for this species has likely remained stable or slightly increased on the Spitz Hill Allotment and remained stable or slightly decreased on the Sitgreaves Allotment.

Environmental Effects

Three key effects are addressed: 1) effects of changes in forage and grass cover and herbaceous vegetation height on grassland and savannah species, 2) effects of changes in forb cover for pronghorn 3) effects of changes in fencing on the American pronghorn antelope, and 4) effects of vegetation around waters to wetland species. Habitat and population trends from the four key effects are discussed at species-specific levels.

Alternative 1 - No Action

Grassland and Savannah Species

The no action alternative would likely result in increases in forage and grass cover on both allotments for the following species or their prey: Chihuahua savannah sparrow, Navajo Mountain Mexican vole, northern goshawk, Rocky Mountain elk, turkey, ferruginous hawk, golden eagle, northern harrier, prairie falcon, and Swainson's hawk. Therefore, this alternative would result in increases in habitat trends for these species on the allotments, owing to increases in forage and grass cover. Increases in forage and grass cover and habitat trends would be greater than under Alternative 2. Increased forage and grass cover would improve foraging success or survival of individuals of these species within the allotments.

The no action alternative would have the opposite effects on the burrowing owl, chestnut-collared longspur, and Gunnison's prairie dog because of their preference for grasslands with less grass cover. Therefore, this alternative would result in a decrease in habitat trend for these species on both allotments. Decreases in habitat trends for these species would be greater than they would under Alternative 2. Increased forage and grass cover would decrease foraging success or survival of individuals or result in displacement of individuals to other areas with appropriate cover characteristics.

Herbaceous vegetation height that is important for pronghorn antelope fawning and nursing cover is likely correlated to some degree with changes in grass cover and general range condition on the allotments, suggesting that this alternative would result in increases in pronghorn habitat trends on the allotments, owing to increases in herbaceous vegetation height. Increases in herbaceous vegetation height may increase pronghorn fawn survival within the allotments. There would be

change in the current condition of pronghorn antelope movement because there would be no fence construction, or removal of fences under this alternative.

Population trends of the Navajo Mountain Mexican vole, Rocky Mountain elk, turkey, burrowing owl, and Gunnison's prairie dog are likely to be correlated with habitat trends. Under the no action alternative, population trends of the Navajo Mountain Mexican vole, Rocky Mountain elk, and turkey would increase on both allotments, at a greater rate than under Alternative 2. On the other hand, population trends of the burrowing owl and Gunnison's prairie dog would decrease on both allotments, at a greater rate than under Alternative 2. Changes in population trends of all of these species under the no action alternative would be attributed to changes in grass cover and associated survival and displacement to other areas with appropriate cover characteristics. Because the AGFD manages populations of the Rocky Mountain elk and turkey, population effects to these species would be less apparent. The Forest-level population trends identified under the Affected Environment for the Rocky Mountain elk and turkey would be increased, barring hunt-limit changes by the AGFD.

For the pronghorn antelope, positive effects under the no action alternative on herbaceous vegetation height and associated fawn survival within the allotments may result in increased pronghorn population trends on the allotments under this alternative. Because the AGFD manages populations of this species, population effects would be less apparent. The Forest-level population trends, identified in the Affected Environment Section, would not be affected in Game Management Unit 7.

No other species would incur changes in population trends under this alternative. Chihuahua savannah sparrow, northern harrier, and chestnut-collared longspur population trends would not likely be affected because these three species are only found on the allotments during the winter. Population trends of the northern goshawk are also not likely to be affected because grasslands and grassland prey species constitute a minor portion of the vegetation types and prey base used by this species. Further, owing to the very large foraging areas used by the ferruginous hawk, golden eagle, prairie falcon, and Swainson's hawk, relative to the amount of foraging habitat present on the allotments, population trends of these species are not likely to be affected.

Wetland Species

The no action alternative would increase vegetative cover within and around waters on both allotments for the cinnamon teal, though this relationship is strongly influenced by climate. Worsening drought conditions, along with continued use of waters by elk, could lessen or offset improvements to vegetative cover. Therefore, this alternative would result in a slight increase habitat trend for this species on both allotments.

Population trends of the cinnamon teal would be likely to be correlated with habitat trends and climate. Under the no action alternative, population trends of the cinnamon teal would increase slightly on both allotments because of less use by livestock. Forest-level population trends and habitat trends identified in the Affected Environment Section would increase slightly.

Alternative 2 - Proposed Action

The proposed action would influence the key effects in the following ways: 1) forage and grass cover and herbaceous vegetation height would be maintained or slightly increased; 2) forb cover for pronghorn would be maintained or slightly increased; 3) fence impediments to pronghorn

would be decreased; and 4) vegetation around existing waters would be maintained or slightly increased on the Spitz Hill Sitgreaves and Sitgreaves Allotments, depending on weather and wildlife use of the waters.

Grassland and Savannah Species

Stable to slight increases in forage and grass cover, and herbaceous vegetation height on the allotments under the proposed action would result in stable to slight increases in habitat trends for the following species: Chihuahuah savannah sparrow, Navajo Mountain Mexican vole, northern goshawk, Rocky Mountain elk, turkey, golden eagle, northern harrier, prairie falcon, and Swainson's hawk. Stable to slightly increased forage and grass cover and vegetation height would maintain or slightly improve foraging success, reproductive success, or survival of individuals of these species within the allotments.

The proposed action would have the opposite effects on the burrowing owl, chestnut-collared longspur, and Gunnison's prairie dog because of their preference for grasslands with less grass cover and herbaceous vegetation height. Therefore, this alternative would result in stable to slight decreases in habitat trends for these species on the allotments. Stable to slightly increased forage and grass cover and herbaceous vegetation height would maintain or slightly decrease foraging success, reproductive success, or survival of individuals of these species within the allotments.

The proposed action would have mixed effects on the ferruginous hawk, owing to its preference of short-stature herbaceous vegetation for foraging, but substantial grass cover for nesting. Therefore, this alternative would result in stable to slight decreases in foraging habitat trends and stable to slight increases in nesting habitat trends for this species on the allotments. Further, foraging success would be maintained or slightly decreased and reproductive success would be maintained or slightly increased for this species within the allotments.

The removal of fences on both allotments would occur in grassland locations that would improve movement of pronghorn antelope within the allotments. The fence removal combined with maintained or slightly increased herbaceous vegetation heights important for pronghorn fawning and nursing cover: and maintained or slightly increased forbs important for pronghorn nutrition would result in positive habitat trends for the pronghorn on the allotments.

Population trends of the Navajo Mountain Mexican vole, Rocky Mountain elk, turkey, burrowing owl, and Gunnison's prairie dog are likely to be correlated with habitat trends. Under the proposed action, population trends of the Navajo Mountain Mexican vole, Rocky Mountain elk, and turkey would remain stable or increase slightly on both allotments. On the other hand, population trends of the burrowing owl and Gunnison's prairie dog would remain stable or decrease slightly on the allotments. Slight changes in population trends of all of these species under the proposed action would be attributed to changes in forage and grass cover and herbaceous vegetation height and associated changes to survival or displacement to other areas with appropriate cover and vegetation height characteristics. Because the AGFD manages populations of the Rocky Mountain elk and turkey, population effects from the project would be minimized due to hunt permit management. The Forest-level population trends identified under the Affected Environment for the Rocky Mountain elk and turkey would remain stable or be increased slightly, barring hunt-limit changes by the AGFD.

Population trends of pronghorn antelope on the two allotments would be slightly improved in the project area. There would be minor positive effects to Forest pronghorn populations and habitat, and on the Forest pronghorn population and habitat trends.

No other species would incur changes in population trends under this alternative. Chihuahua savannah sparrow, northern harrier, and chestnut-collared longspur population trends are not likely to be affected because these three species are only found on the allotments during the winter. Population trends of the northern goshawk are also not likely to be affected because grasslands and grassland prey species constitute a minor portion of the vegetation types and prey base used by this species. Further, owing to the very large foraging areas used by the ferruginous hawk, golden eagle, prairie falcon, and Swainson's hawk, relative to the amount of foraging habitat present on the allotments, the small scale of effects on habitat trends for these species (i.e., stable to slight increases) and their prey from this alternative, and the mixed effects on ferruginous hawk foraging and nesting habitats, population trends of these species are not likely to be affected. The Forest-level population trend of the northern goshawk identified in the Affected Environment Section would not be affected.

Wetland Species

The proposed action would maintain or slightly increase vegetative cover within and around waters on both allotments for the cinnamon teal. Because this relationship is strongly influenced by climate and drought conditions, it could offset any improvements from management. Therefore, this alternative would result in a slightly increasing or stable habitat trend for this species on both allotments.

Population trends of the cinnamon teal would be likely to be correlated with habitat trends and climate. Under the proposed action, population trends of the cinnamon teal would increase slightly or remain stable on the both allotments. Oscillating, but stable Forest-level population trends would not be affected.

Cumulative Effects

Cumulative effects on wildlife are those that occur from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future activities. The geographical extent of the cumulative effects analysis area includes four watersheds: Cataract, Spring Valley Wash, Upper Havasu, and Sycamore Canyon watersheds. This landscape encompasses the home ranges of the shorter-ranging species and the seasonally occupied areas used by far-ranging ungulates and migratory birds analyzed. The time frame for this analysis is from 15 years ago to 10 years from now.

The following key activities within the cumulative effects analysis area are considered relevant in analyzing cumulative impacts from grazing on the Spitz Hill and Sitgreaves Allotments:

Tree Thinning

Thinning of small- and medium-diameter pines increases abundance and vigor of understory vegetation (grass, forbs, shrubs). Past, ongoing, and reasonably likely future thinning projects include the following vegetative treatment, grassland improvement, and aspen restoration projects: Beacon, Elk-Lee, Round-Oak-Tule, Dogtown, Frenchy, Reneke, Clover High, Marteen, Williams High Risk, KA Hill Fire Surrogate, Government, Ebert, Brannigan, Spring Valley,

Potato Hill, Smoot Lake, Juan Tank, Eagle, Hardy, North Bull Trap, Polson, Homestead, Northwest Hat, Monte Carlo, Pedigo, Antelope Tank, and Signal Hill. These projects encompass a total of approximately 26,538 acres of vegetation treatment and 6,640 acres of grassland restoration.

Prescribed Fire

Prescribed fire increases abundance and vigor of understory vegetation. Past, ongoing, and reasonably likely future prescribed fire activities are included in the following projects: Beacon, Elk-Lee, Round-Oak-Tule, Frenchy, Pineaire, Clover High, El Paso, Williams High Risk, KA Hill Fire Surrogate, Government, Brannigan, Spring Valley, Twin, Government Prairie Burn, and Kendrick Burn. Within the analysis area, 36,427 acres have been burned with prescribed fire over the past 15 years and an additional 44,000 acres are planned in the next 5 years.

Domestic Livestock Grazing

Historic domestic livestock grazing has altered understory vegetation within the analysis area. More recent past, present, and reasonably foreseeable livestock management actions within the analysis area indicate an improving trend in the abundance and vigor of understory vegetation. Past, ongoing, and reasonably likely future National Environmental Policy Act (NEPA) decisions for domestic livestock grazing include the following allotments: Big Springs, Corva, Juan Tank, Garland Prairie, Hat, Homestead, Davenport Lake, Tule, Sitgreaves, Spitz Hill, Chalender, Bellemont, Government Prairie, Pomeroy, and Twin Tanks. These allotments cover approximately 288,173 acres within the analysis area.

Fence Construction

Approximately 800 miles of fence exist within the analysis area. Over the past 15-20 years, approximately 6 miles of fence were removed from the Homestead Allotment, 2 miles of new fence were constructed on the Spitz Hill Allotment, and approximately 14 miles of new fence were constructed in other locations across the analysis area. All recent fence construction has included specifications to promote pronghorn movement, i.e., smooth bottom wire no less than 18 inches from the ground. Approximately 80 locations along 40 miles of fence in the analysis area were modified to promote pronghorn passage. Modifications included raising the bottom wire up to a minimum height of 18 inches, at locations where pronghorn passage was evident and inserting a smooth piece of PVC pipe around the bottom barbed wire.

Table 11. Estimated Cumulative Effects of the Proposed Action on Wildlife Habitat Features and Affected Species

Habitat Feature and Affected Species	Commutative Effects of Past, Present, and Foreseeable Projects	Direct and Indirect Effects of the Proposed Action	Cumulative Effect of the Proposed Action
<p>Abundance & Vigor of Understory Vegetation (grass, forbs, and shrubs)</p> <p>Chihuahuah savannah sparrow, Navajo Mexican vole, pronghorn antelope, and prey species for northern goshawk</p>	<p>Past, present, and future thinning and prescribed fire activities, and a net decrease in the amount of allowable grazing in the analysis area have/would result in an increase in the abundance and vigor of understory vegetation and an increase in the foraging, reproductive success, and survival of associated species.</p>	<p>Under the proposed action, there would be a stable to slight increases in the abundance and vigor of vegetation, resulting in a stable to slight increase in the foraging, reproductive success, and survival of associated species.</p>	<p>Augment the increase in abundance and vigor of understory species and the foraging, reproductive success, and survival of the associated species.</p>
<p>Fences</p> <p>pronghorn antelope</p>	<p>Past, present, and foreseeable projects, and the construction of private fences around private lands have/would result in a net increase in miles of fence in the analysis area. Improvements to existing fences and fences built to AGFD standard slightly offset this negative effect to pronghorn movement.</p>	<p>There is a net removal of fence under the proposed action, improving pronghorn antelope movement in the project area.</p>	<p>The improvement to pronghorn movement under the proposed action would reduce the negative cumulative effect to pronghorn movement of past, present, and foreseeable projects, and private land fencing.</p>
<p>Waters and surrounding vegetation</p> <p>nesting waterfowl. migrant shorebirds.</p>	<p>Past use by livestock and wildlife in the analysis area has decreased vegetation around waters, however present and foreseeable projects would result in a stable to slight increasing trend.</p>	<p>The proposed action would maintain or slightly increase vegetative cover within and around waters on both allotments for the nesting waterfowl and migratory birds, maintaining or slightly improving the quality and quantity of habitat for these species.</p>	<p>The stable or slight positive effects of the proposed action would have a neutral to slight positive effect on the waters and surrounding vegetation. With the negligible direct and indirect effects of the proposed action, there would be negligible cumulative effects.</p>

Noxious Weeds

Existing Condition

Populations of bull thistle, Scotch thistle, and Dalmatian toadflax occur within the allotments. They are generally found in areas with regular disturbance, such as pipeline rights-of-ways, roadsides, and a cinder pit. There are no noxious weeds in locations heavily used by livestock. While the size of these populations has been static over the last few years, there is still potential for them to expand into new areas, both inside and outside of the allotments. Spotted, diffuse, and Russian knapweeds occur nearby but outside the allotments (PR# 12).

Known weed populations have been monitored and manually controlled annually since 2001. Limited surveys for new populations are also performed annually. There has been no increase in the size of any populations; most are decreasing. The seeds of bull thistle, Scotch thistle, and the knapweeds are wind-dispersed. The potential for livestock or wildlife to spread them is minimal. Dalmatian toadflax seed also does not adhere to animal fur.

Direct and Indirect Effects

Alternative 1 – No Action

Under the no action alternative (no grazing), there would be no soil disturbance from trampling or concentrated grazing of livestock. There would be no project-based increase in noxious weed habitat and areas that are currently vulnerable to colonization by noxious weeds would eventually revegetate. Because the existing weed populations and their habitat are a result of ongoing human disturbance, rather than livestock grazing, removing grazing would not decrease current populations of weeds. Removing grazing would only decrease area that is currently vulnerable to colonization. Additionally, in the absence of grazing, regular site visits would not occur, leaving noxious weed populations unmonitored or undetected.

Alternative 2 – Proposed Action

The proposed action would perpetuate some areas of bare soil. These are found close to stock tanks, other watering sites, and salting locations. Since no noxious weeds are currently found in these locations, continued stocking at current or reduced levels should not increase the risk of weed introductions. Decreasing the number of days in each pasture and decreasing use in some areas by improving water distribution may decrease bare soil in heavily used watering sites. With the proposed grazing management, there would be regular range inspections and required range monitoring that provide opportunities for increased detection of noxious weeds if they are present. Additionally, mitigation for the prevention and control of noxious weeds is included as part of the proposed action.

Cumulative Effects

The cumulative effects analysis period for noxious weeds begins in 2001, when annual monitoring and control began on the Williams Ranger District. It extends ten years into the future, to 2015, because this is the period of time covered by the current weed management strategy (USDA 2005).

The cumulative effects analysis area for noxious weeds is the two allotments, surrounded by a one-mile buffer. Other past, present, and future ground-disturbing activities in this area are dispersed recreation, use and maintenance of State Highway 66, Highway 64, County Road 141, County Road 74, pipelines, and forest roads, timber sales, and fuels reduction projects. Noxious weeds are known to occur along Highway. 66, County Road 141, at Oak Hill Snow Play Area, at the Garland Prairie Overlook, and at scattered locations in Government Prairie.

Past, present and future vegetation and fuels management projects that may increase habitat for noxious weeds or spread existing weeds include Pineaire, Barrier, Government Prairie Grassland Burns, Wright Hill Timber Sale, Government Hill Timber Sale, R-S Timber Sale, and Spring Valley Timber Sales #1 and #5. Noxious weed monitoring and control are required mitigation on all projects approved since 2001. Watershed Best Management Practices included in all projects approved since 1991 (USFS Region 3 and State of Arizona 1990) assure that no long-term noxious weed habitat is created (PR# 52).

A plan for integrated weed management on the Kaibab, Coconino, and Prescott National Forests was approved in 2005 (EIS). This plan establishes priority species, acreage goals, and a variety of methods for control. Implementing the plan would increase weed monitoring and treatment on all three Forests. Where manual control of noxious weeds has not been effective, herbicides may be used.

The Radio Hill Roads Analysis proposes closing or obliterating up to 117 miles of roads in the vicinity of the grazing allotments. Such closures would reduce existing and future habitat for noxious weeds and decrease opportunities for the introduction or spread of noxious weeds.

Because weed populations in the analysis area are small and localized, and because the proposed project, as well as all other projects in the analysis area, incorporate mitigation measures that control the development of bare soil and requires monitoring and treatment of weeds, the cumulative impact of grazing is insignificant.

Threatened, Endangered, and Sensitive Plant Species

There are no plant species listed as Threatened or Endangered by the US Fish & Wildlife Service that occur on the Williams Ranger District. There are seven Forest Service, Region 3 Sensitive Species (USDA1999) that are known to or potentially occur on the Williams Ranger District. There may be habitat for three of these in the Spitz Hill/Sitgreaves project area: Mt. Dellenbaugh sandwort, Rusby's milkvetch, and Flagstaff beardtongue.

There is no suitable habitat for Tusayan rabbitbrush, cliff fleabane, or Flagstaff pennyroyal because suitable soils do not occur in the project area. The shaded, moist habitat required for Arizona bugbane also does not exist in the project area. Just outside the project area, there is potential habitat on the north side of Sitgreaves Mountain. This area has been surveyed and no Arizona bugbane plants were found.

None of the sensitive plant species for which there may be suitable habitat are known to occur on either of the allotments. Ongoing range inspections, noxious weed monitoring and surveys, and wildlife monitoring have provided the opportunity to detect sensitive plants on most parts of the allotments, but there have been no observations. Forest botanists, biologists, and range managers would continue to look for sensitive plants during all site visits.

Rusby’s milkvetch habitat is most likely to occur on the slopes of Wright Hill or Sitgreaves Mountain. Flagstaff beardtongue habitat includes those sites plus the other forested hills. Small meadows interspersed with woodland on eastern Sitgreaves allotment and western Spitz Hill allotment may provide habitat for Mt. Dellenbaugh sandwort.

Table 12. Sensitive Plant Species on the Williams Ranger District.

Common Name	Scientific Name	Suitable Habitat	Possible Habitat in Project Area
Mt. Dellenbaugh sandwort	<i>Arenaria aberrans</i>	Meadows or near meadow edges within oak and pine forests; elev. 5500 – 9000 ft.	Yes
Rusby’s milkvetch	<i>Astragalus rusbyi</i>	Dry or temporarily moist basaltic soils in aspen, mixed conifer, ponderosa pine, and pine - oak.	Yes
Tusayan rabbitbrush	<i>Chrysothamnus molestus</i>	Calcareous soils; pinyon-juniper and grasslands.	No
Arizona bugbane	<i>Cimicifuga arizonica</i>	Shady, moist canyon bottoms, seeps, springs; high humus soils; high humidity.	No
Cliff fleabane	<i>Erigeron saxatilis</i>	High on canyon walls in isolated pockets in sandstone outcrops.	No
Flagstaff pennyroyal	<i>Hedeoma diffusum</i>	Dolomitic limestone outcrops or soils in ponderosa pine forest.	No
Flagstaff beardtongue	<i>Penstemon nudiflorus</i>	Dry slopes in ponderosa pine, on light, dry, neutral soils in mountainous or eroded regions.	Yes

Direct and Indirect Effects

Alternative 1 – No Action

The No Action alternative would remove cattle grazing from both allotments. This would have little to no effect on populations or habitat for Rusby’s milkvetch or Flagstaff beardtongue, since cattle currently spend little time in those areas. Meadow habitat for Mt. Dellenbaugh sandwort might improve, though there could also be increased plant competition against any sandwort that may be present. According to Kearney and Peebles (1960) the genus *Arenaria* provides excellent forage wherever it is sufficiently abundant, but that it does not withstand heavy grazing. No heavy grazing of *Arenaria* species has been observed anywhere on the Williams Ranger District (personal observation, L. Johnson). The palatability of *A. aberrans* is unknown, but if cattle do eat it, removing grazing could improve its survival, if any plants occur on the allotments.

Alternative 2 – Proposed Action

The proposed action would have little or no effect on Rusby milkvetch or Flagstaff beardtongue habitat or populations, because areas where they could occur are little used by cattle. Seasonal utilization standards prevent cattle from using grasslands to the point that they are forced to utilize uplands. Cattle would continue to use areas that may be habitat for Mt. Dellenbaugh sandwort. Utilization standards prevent significant degradation of meadow habitat. If the species

is present and if it is grazed by cattle, the proposed action could have a negative impact on Mt. Dellenbaugh sandwort. However, mitigation measures require that if any sensitive plant species is found on the allotments, monitoring of grazing impacts would occur and management would be adapted to assure long-term sustainability of the populations. The Proposed Action would have no significant negative effects on any of the sensitive plants or their habitat that may occur on the allotments.

Cumulative Effects

Fuels and vegetation management projects that open up the tree canopy generally increase the diversity and productivity of the herbaceous understory. This is beneficial to many ecosystems and improves habitat for the sensitive species in question. However, it is also likely to attract cattle into areas they have previously ignored. Increased trampling and herbivory could have negative impacts on sensitive species habitat and populations.

Projects on Sitgreaves or Spitz Hill Allotments in the last 10 years would still have measurable effects on openness and understory. Most projects older than 10 years would be starting to close in again, decreasing their attractiveness to cattle. Past, current, and future projects that could attract cattle into sensitive plant habitat include: Wright Hill Timber Sale, Government Hill Timber Sale, R-S Hill Timber Sale, Spring Valley #5 Timber Sale, and Pineaire Fuels Reduction. These areas should receive increased monitoring to determine if they are being more heavily utilized.

Road closures proposed in the Radio Hill Roads Analysis will decrease human disturbance (off-road vehicle use and dispersed camping) in potential sensitive plant habitat.

Increased noxious weed control stemming from completion of the Kaibab, Coconino, and Prescott National Forests' plan for Integrated Treatment of Noxious or Invasive Weeds (2005) will improve some sensitive species habitat by removing non-native species that compete aggressively with sensitive species for resources.

Beneficial effects on habitat from other projects in addition to the neutral effects of the proposed action produce no significant cumulative impacts on Threatened, Endangered, or Sensitive plant species or their habitats.

Heritage

Affected Environment

Heritage Resources: Approximately 45% (15714 out of 35159 acres) of the Spitz Hill/Sitgreaves Grazing Project has been previously surveyed for heritage resources, primarily for timber sale, range and roads projects. Archaeologists have located 252 heritage resource sites (10.3 sites per square mile).

Direct and Indirect Effects:

Alternative 1 – No Action

The no action alternative would have no measurable direct or indirect effects on any heritage resources.

Alternative 2 - Proposed Action

Alternative 2 would have no measurable adverse effects to any heritage resources. With respect to grazing, two site types deserve special attention. Cave/rock shelters are important sources of stratified and well-preserved cultural deposits that are vulnerable to livestock traffic disturbance. Rock art sites may be vulnerable to livestock rubbing against its surface. In the grazing project area, there are 3 petroglyph sites and two rock shelters that require monitoring. Sites AR-03-07-02-01, -222, -243, -960 and -1455 should be periodically monitored for possible impacts (PR# 40).

Should any plans be considered ground-disturbing undertakings, heritage resource specialists would consider those projects subject to the Section 106 process of the National Historic Preservation Act of 1966. South Kaibab Zone heritage resource specialists would conduct appropriate consultations with both neighboring tribes and the State Historic Preservation Office.

Cumulative Effects

Because there are no direct or indirect effects there would be no cumulative effects of this alternative on Heritage Resources.

Recreation and Scenic Resources

Recreation and scenic resources are related. High-quality scenery and unique scenic resources are important to recreationists and are an integral part of high-quality recreational settings. Highly attractive and scenic landscapes, and high quality recreational facilities and attractions can be important to quality of life. They also contribute to the success and growth of a vibrant tourism industry, contributing to the local economy.

Affected Environment

Results from recent national and local visitor surveys (USDA 2001) indicate a large percentage of national forest visitors travel to the South Kaibab from the densely populated Phoenix Valley urban communities and Colorado River communities, from Las Vegas, Nevada, and other communities in Arizona. Many visitors from these lower elevation communities travel to the area to escape the intense summer heat, preferring to recreate in the cool high elevation pine forests. Local residents are also a significant user group, as they have immediate access to the national forest.

Recreational use has been increasing steadily over time, and is expected to continue to grow across the Kaibab National Forest. According to national recreation use studies, nationwide recreational use of national forests is expected to increase at least at a rate comparable to the population growth rate nationwide. As recreation use increases, the types of recreation activities visitors engage in are likewise increasing and diversifying. The types of recreational activities visitors pursue in the project area are varied, occurring mostly in dispersed settings, and occurring across all seasons. Uses of the area include pleasure driving, viewing scenery and wildlife, dispersed camping, hiking, mountain biking, horseback riding, riding ATVs and motorcycles, hunting, snowshoeing, and cross-country skiing.

There are 3 Recreation Opportunity Spectrum (ROS) ROS classes within the Spitz Hill and Sitgreaves Allotments, including Rural ROS surrounding the adjacent more densely populated rural communities, Rooded Natural ROS on a majority of the project area, and Semi-Primitive Non-Motorized on the slopes of Sitgreaves Mountain. Forest Plan direction states that ROS classes are to be considered in the design of project activities and ROS classes will be maintained or enhanced.

Developed recreation facilities in the project area include the Great Western Trail, Route 66 Interpretive pull-outs, cross-country ski trails, and Key Hole Sink hiking trail.

Besides a diversity of recreation activities pursued, there are also diverse responses from local residents and forest visitors about cattle on the Forest. Responses to livestock on the forests depend on many factors, including background, culture, personal values, and specific life experiences. To the visitor traveling along the highways or backroads, cattle may be picturesque and typical of the “western life-style”. Others interpret such a scene as unnatural, disrupting their perception of the Forest as a “wild place.” In a study on National Forest Lands in southwestern Colorado, the number of visitors indicating that range livestock added to their stay (34%) was no different than the number stating that there was a negative relationship (33%) (Mitchell et al. 1996).

Scenic Resources

The Spitz Hill and Sitgreaves Allotments surround Sitgreaves Mountain, which is a recreation destination and important scenic feature, and represents a component of the local community’s scenic identity and image, contributing to its “sense of place”. In addition, private landowners with property within or adjacent to the project area view the surrounding landscape on a daily basis, and are likely to consider it important to their quality of life.

Also important are the “special areas” in the project area, which hold high value and meaning for visitors and local residents (spiritual, aesthetic, nostalgic, or other). Sitgreaves Mountain was identified as one such “special area”. The Historic Route 66 Highway and Key Hole Sink may also be considered “special areas”.

Landscape Character Goals and Scenic Integrity Objectives (SIO) for the project area have been defined in the Forest Plan and the Kaibab ROS/SMS Guidebook (2004). SIOs define the degrees of deviation in form, line, color, scale and texture that may occur at any given time, thus helping to define a transition strategy between the existing landscape character and scenic integrity, and the desired landscape character and integrity. SIOs overlay and cross Ecosystem Management Area boundaries. Because of the scenic value around Sitgreaves Mountain, the area is classified as SIO 2 (High). Several small unseen areas away from major travel routes within the project area are classified as SIO 3 (Moderate).

Direct and Indirect Effects on Recreation and Scenic Resources

Alternative 1 - No Action Alternative

Under the No Action alternative, no grazing permit would be issued and no roadside pit tanks would be constructed. For visitors who feel that the presence of cows disrupts their sense of naturalness, the quality of their visitor experience would increase. For those who view cows as

picturesque and representative of the western lifestyle, the quality of their experience may diminish.

Alternative 2 --Proposed Action

ROS classes would be maintained and proposed changes to livestock management would not be detectable to most forest visitors, so existing recreational settings would not change. The net removal of 2.3 miles of fence should improve scenic integrity.

For those that view evidence of human influence and mechanical disturbance as unattractive and disruptive, the construction of pit tanks may have a negative effect on their recreation experience. However, the proposed pit tank locations are away from high use or highly visually sensitive areas, so this effect would be minor. For those who enjoy viewing wildlife or hunting, water developments (pit tanks) may be good locations for observing wildlife. This would potentially result in a slight positive effect for these individuals.

There are no known high-use recreational areas within either allotment, and dispersed recreational use is low to moderate. Therefore, it is estimated that potential conflict between recreational use and cattle grazing within these allotments would be minor under the proposed action.

Cumulative Effects

Because the proposed action would have only minor positive and negative effects, resulting in a net neutral effect, the cumulative effects of the proposed action when combined with past, present, and foreseeable project would be negligible.

Economics/Lifestyle

Affected Environment

The economy of Northern Arizona has long been tied to agricultural-based activities such as ranching and logging. Livestock grazing has occurred at varying intensities within the project area since the late 1880's. The current permit holders for the both the Spitz Hill and Sitgreaves Allotments are individually owned small operators. The high ratio of Federal to private lands in Arizona forces livestock operators in the arid southwest to seek permits on public lands.

With urbanization and the associated changes in values have come changes in the economic base of this area. Tourism is now considered the leading industry in Northern Arizona. However, domestic livestock grazing still contributes to the livelihood of the permittees, their employees and employees of ranching-based services. Additionally, the permittees indirectly contribute to the local and regional economy through taxes, investments and spending by employees in the local community.

Some economic concerns over grazing use are related to public perceptions about the appropriate use of public lands, customs and traditions of the area and the community and ranching life-style in relation to forest resources. Many critics of public lands livestock grazing argue that the government unjustly subsidizes ranchers by charging low grazing fees that do not cover the costs of administering the range program. However, ranching provides jobs and income in more rural areas where economic opportunities are few. In addition, it is also important to understand that

current policies and laws prohibit the Forest Service from charging fair-market value (USDA 1995).

Some argue that because the percentage that recreation contributes to local economies has increased and the percentage the livestock industry contributes to local economies has declined, that ranching is no longer important to the neighboring communities. A report by Taylor et al. (2004) conducted on the Big Horn National Forest concluded that local economies would decline if grazing in the area was significantly reduced. The analysis suggests that what is best for local economies is to have both the livestock and recreation industries sustained. This provides for a more diversified economy as well as supports the multiple-use concept of managing federal lands.

Regardless of the different viewpoints about livestock grazing on public lands, the Forest Service is required by law and the Kaibab National Forest Plan to provide the opportunity for livestock grazing on public lands, consistent with other resource values, and without impairing land productivity.

Economic/Lifestyle Effects

The following table summarizes the economic effects of the alternatives. Values are on an annual basis for the Spitz Hill and Sitgreaves Allotments only. Not shown in this amount are the taxes that counties collect on range structural improvements, which are based on a percentage of the assessed values of those improvements. Because of unpredictable and unknown information, the figures below are not precise, but serve as a relative index of profitability between alternatives.

Table 13. Summary of Economic Attributes and Effects.

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Proposed Action
Livestock Activity Permitted	No	Yes
Estimated Gross Revenue	None	\$182,460
Estimated Operational/Maintenance Costs	None	\$46,350
Grazing Fees	\$0	\$5,485
Estimated Net Revenue	None	\$130,625
Number of Jobs Supported	None	~6
Contributions to the Range Betterment Fund	None	\$2743
Contributions to Coconino County	None	\$1371
Contributions to the U.S. Treasury	None	\$1371
Estimated Cost to the Government	\$9,564	\$18,095
Receipt/Cost Ratio	N/A	0.3:1

Note: These estimates are based on full stocking.

Alternative 1 – No Action

Under Alternative 1, a new term permit would not be issued. Without a Federal grazing permit, neither of these operators would likely continue to operate. The opportunity for the permittee to pursue the ranching lifestyle and make a livelihood from grazing operations on these allotments would be ended. Revenues generated through ranch-related purchases, taxes, and fees would drop to zero and roughly 6 jobs would be eliminated.

Alternative 2 - Proposed Action

If Alternative 2 is implemented, the ranching lifestyle would be maintained, and the permittees would continue to make a livelihood from cattle-grazing operations on these allotments.

The Public Rangelands Improvement Act (PRIA) of 1976 allows up to 50% of the grazing fees to go back to the Forest where the grazing fees were generated. These funds would continue to be used for range improvements such as grassland maintenance or water development projects.

The Forest Service pays a portion of the grazing fees collected from grazing permits (25%) in lieu of taxes to Coconino County each year. Although these contributions are small in relation to other businesses and funding sources, they are an important part of county revenues. Coconino County uses national forest fees for highway maintenance and schools. Additionally, Coconino County and the State of Arizona would continue to receive taxes paid by the permit holder for using Federal land for grazing purposes. These state taxes are a percent of the assessed value of the permit based on grazing fees.

Besides these tangible benefits, there are a number of intangible benefits associated with the Range Management program that are not easily quantified. For example, waters that are developed for livestock are also available for wildlife. Natural water sources are rare on the District, so these developed waters help to provide needs for deer, elk, antelope, turkey, and in some cases, wetland species.

Additionally, tree encroachment into natural grasslands has been a resource issue for a number of years in the Southwest. As grasslands become invaded, they shrink in size and affect habitat availability for grassland-dependent species, such as pronghorn antelope, Gunnison's prairie dog, and small mammals that serve as prey for raptors. The Forest Service has very limited funding to restore and maintain these grasslands. Several permittees on the District have assisted significantly over the past decade in providing their own resources (tractors equipped with shears) to remove encroaching trees from these historic natural grasslands.

Environmental Justice

On February 11, 1994, President Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." This Executive Order was designed to focus the attention of federal agencies on the human health and environmental conditions in minority and low-income communities. It requires federal agencies to adopt strategies to address environmental justice concerns within the context of existing laws, including NEPA.

The goal of Environmental Justice Analysis is not to shift risks among populations, but to identify potential disproportionately high and adverse effects, and to identify alternatives that may

mitigate these impacts. One way that this is achieved is by providing an opportunity for minority and low-income populations to participate in planning, analysis, and decision making. Individual tribal members may use the project area for the personal collection of traditional or medicinal plants. Low-income groups may use the area for the collection of fuelwood. Neither alternative would have adverse effects on these uses or to low income and minority populations in the area. No concerns or issues related to Environmental Justice were raised during project scoping or the Notice and Comment period. Additionally, the American Indian Tribes listed in Chapter 4 were consulted regarding this proposal and no concerns were expressed.

Chapter 4 - Consultation and Coordination

The Forest Service consulted the following individuals, Federal, state and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

ID Team:

Ariel Leonard, Team Leader	NEPA Planner
Gary Hase, Jr.	Range Management Specialist
Lauren Johnson	Soils and Watershed Specialist/Plant Ecologist
Chuck Nelson	Wildlife Biologist
Neil Weintraub	Archeologist

Support:

Bonnie Bennettsen	Wildlife Biologist
David Brewer	Range and Watershed Program Manager
Tim McGann	GIS Specialist
John Brink	Technical Services Branch Leader
Melissa Schroeder	Tribal Liaison
Robin Rose	Recreation and Wilderness Staff
Paul Webber	Range Management Specialist

Federal, State, and Local Agencies:

US Fish & Wildlife Service
Arizona Game and Fish Department
Arizona Department of Agriculture
Arizona Department of Environmental Quality

Permittees:

Allan Grantham	Spitz Hill Allotment
Ed Johnson	Sitgreaves Allotment

American Indian Tribes:

Hopi Tribe

Navajo Nation

Hualapai Tribe

Havasupai Tribe

Yavapai-Prescott Indian Tribe

Pueblo of Zuni

Others:

Greta Anderson

Center for Biological Diversity

Billy Stern

Forest Guardians

Chuck Metchis

Arizona Pointing Club

Jeff Burgess

Rick Erman

Glossary

Allotment: Federal lands designated for grazing under a specific plan of management.

Allowable Use: The degree of utilization considered desirable and attainable on various parts of an allotment.

Animal Unit Month (AUM): 1) The amount of forage required by an animal unit for one month.
2) One animal unit, or equivalent, occupying rangeland for one month.

Animal Unit: One mature 1,000 pound cow, or its equivalent based on average daily forage consumption (i.e. one yearling weighing 600-700 pounds is 0.7 animal units).

Best Management Practices (BMP): A practice or combination of practices that are the most effective and practical means of achieving resource protection objectives.

Boot Stage: Growth phase of grasses identifiable by head emergence when the inflorescence reaches near-maximum height, followed by flowering and fertilization.

Cool-Season Grass: A grass which generally makes the major portion of its growth during the spring and sets seed in the late spring or early summer. Cool season grasses include mutton bluegrass, Junegrass, Arizona fescue, western wheatgrass, and bottlebrush squirreltail.

Deferment: A delay or discontinuance of livestock grazing in an area for a specific period of time during the growing season to promote plant reproduction and restore vigor to existing plants.

Deferred Rest-Rotation: A grazing system where a pasture is rested from livestock grazing for one year, and livestock use within other pastures on the allotment is seasonally deferred.

Deferred Rotation: A grazing system, which provides for systematic rotation of deferment among pastures to avoid grazing at the same time of the growing season each year.

Diversity: "The distribution and abundance of different plant and animal communities and species" (36 CFR 219.3).

Ephemeral Wetland: A wetland that is generally shallow and only holds water for short periods, typically in wetter seasons and years.

Exclosure: An area of land enclosed by a barrier, such as a fence, to protect vegetation and prevent grazing by animals.

Forage: Non-woody plants (grass, grass-like plants, and forbs) and portions of woody plants (browse) which is available to and may provide food for livestock and wildlife.

Forage Production: The weight of forage produced within a period of time in a given area.

Forage Utilization: The degree to which animals have consumed or trampled the total annual production of plants, expressed in percent. It may refer to the use of a pasture or use of an individual plant.

Grasslands: Non-forested lands dominated by grasses, grass-like plants, and/or forbs.

Grazing Period: The time that livestock are allowed in each pasture or allotment.

Heritage Resource: Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places.

Key Areas: A portion of rangeland selected because of its location, grazing, or browsing value, or use that serves as a monitoring and evaluation point for range condition, trend, or degree of grazing use. Key areas are normally ¼ to one mile from water, located on productive soils on level to intermediate slopes, and readily accessible for livestock grazing.

Mitigation Measures: Actions taken to lessen the severity of the effects of other actions.

Range Readiness: When soils are not wet and the majority of cool season grasses have emerged past the "boot stage" (when grass seed heads have emerged).

Range Improvement: Any activity or program on or relating to rangelands which is designed to improve production of forage, change in vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, or provide habitat for wildlife or livestock.

Stock Tank: An earthen tank for providing water for livestock and wildlife.

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Appendices

Appendix 1. Past, present and foreseeable projects considered in the assessment of cumulative effects.

Project Name	Project Description	Acres
Beacon	Thin from below, Rx Burn	1193
Elk-Lee	Thin from below, Rx Burn	4300
Round-Oak-Tule	Thin from below, Rx Burn	6200
Dogtown I	Thinning of small- and medium-diameter pines	3400
Dogtown II	Thin from below, Rx Burn	8209
Frenchy I	Thin from below, Rx Burn	8513
Frenchy II	Thin from below, Rx Burn	18000+
Reneke	Thinning of small- and medium-diameter pines	5044
Clover High	Thin from below, Rx Burn	750
Marteen	Thin from below, Rx Burn	2115
Williams High Risk	Thin from below, Rx Burn	904
KA Hill Fire Surrogate	Thin from below, Rx Burn	110
Government	Thin from below, Rx Burn	8200
Ebert	Thinning of small- and medium-diameter pines	250
Brannigan	Thin from below, Rx Burn	2650
Spring Valley	Thin from below, Rx Burn	1850
Wright Hill	*Small timber sale, part of the Spring Valley Project	
Potato Hill Habitat Improvement	Grassland Maintenance, small-diameter conifer removal	1275
Smoot Lake	Grassland Maintenance, small-diameter conifer removal	1000
Juan Tank	Grassland Maintenance, small-diameter conifer removal	1000
Eagle	Grassland Maintenance, small-diameter conifer removal	325
Hardy	Grassland Maintenance, small-diameter conifer removal	100
North Bull Trap	Grassland Maintenance, small-diameter conifer removal	250
Polson	Grassland Maintenance, small-diameter conifer removal	225
Homestead	Grassland Maintenance, small-diameter conifer removal	400
Northwest Hat	Grassland Maintenance, small-diameter conifer removal	500
Monte Carlo	Grassland Maintenance, small-diameter conifer removal	300
Pedigo	Grassland Maintenance, small-diameter conifer removal	500
Antelope Tank	Grassland Maintenance, small-diameter conifer removal	650
Signal Hill	Grassland Maintenance, small-diameter conifer removal	300

Project Name	Project Description	Acres
Buggy Wheel	Grassland Maintenance, small-diameter conifer removal	350
TO Tank	Grassland Maintenance, small-diameter conifer removal	~620
Parks West	Vegetation Treatment	
Pineaire	Rx Burn	370
El Paso	Rx Burn	450
Twin	Rx Burn	14,900
Government Prairie Burn	Rx Burn	4,000
Kendrick Burn.	Rx Burn	6,400
Big Springs	Grazing	18,545
Corva	Grazing	12,818
Juan Tank	Grazing	18,535
Garland Prairie	Grazing	6,903
Hat	Grazing	10,400
Homestead	Grazing	6,689
Davenport Lake	Grazing	7,644
Tule	Grazing	60,187
Sitgreaves	Grazing	20,390
Spitz Hill	Grazing	12,909
Chalender	Grazing	12,378
Bellemont	Grazing	10,367
Government Prairie	Grazing	10,894
Pomeroy	Grazing	3,160
Twin Tanks	Grazing	11,940
Fence removal and modification	Fence removal and modification	~5 miles/year
City	Fuels Reduction	12,403
Barrier	Rx Burn	250

Appendix 2. Non-Significant Issues and Agency Response

1. The benefit of water developments for wildlife is unfounded; there is evidence to suggest the opposite.

Response: There is minimal peer-reviewed evidence to support the view that water developments have adverse effects on wildlife. The most commonly cited potential adverse effects include predation, competition, direct mortality, and health problems resulting from poor water quality. These potential adverse effects are largely untested hypotheses, or have been shown to occur infrequently (Rosenstock et al. 1999). Additionally, the commenter did not provide contradictory references or evidence.

The primary purpose for installing the pit tanks is to improve cattle distribution by providing water in areas that are currently underutilized. Several studies *have* shown that many game and non-game species benefit from water developments (Rosenstock et al. 1999).

2. New fencing could negatively affect wildlife.

Response: The proposed fence modification is designed to benefit wildlife movement. The proposed new section of fence, which is about 0.1 mile long, would allow for the removal of 0.3 mile of fence. This modification would remove a “trap” by closing off a long thin dead end section at the north end of the pasture and result in a net removal of 0.2 miles of fence in this portion of the pasture

3. The impoundment of water in the stock tank could affect the aquatic species animals, and aquatic invertebrates in the wetland.

Response: There is one stock tank at the edge of the Duck Lake ephemeral wetland that was established in 1938. The proposed action would maintain, not increase the surface area or depth of the tank. No tank modifications are proposed. Given that water flowing into the tank is a very small portion of the water flowing into the wetland and that impounding that water makes no meaningful difference in the wetland’s inundation period, the concern that livestock consumption of tank water impacts the wetland is unfounded.

There would be little effect to macroinvertebrates because 1) 80% of the wetland is fenced to exclude cattle, and 2) under the proposed action, cattle use around individual tanks would be reduced, because five additional water sources are proposed.

4. It is hard to know the impacts to rare plants without surveys and monitoring of known populations.

Response: Multiple range inspections, range monitoring visits, and weed and wildlife surveys in the project area have not resulted in the detection of any of the three sensitive plants that may occur (See Chapter 3 p. 42). Should any populations be detected, they would be monitored to determine impacts and management would be adjusted as needed.

5. Utilization standards are not sufficient if there is very little vegetation to start with.

Response: Without proper management, this could be an issue. However, grazing is not authorized on the allotment unless current year’s forage is at least 100 pounds per acre. This

District standard is intended to protect watershed condition and make sure sufficient forage is available for wildlife and livestock.

6. This document does nothing to improve the hiding cover for pronghorn antelope.

Response: The changes from a rest-rotation to a deferred rotation on the Sitgreaves Allotment and the change from a four to five pasture deferred rotation on the Spitz Hill Allotment should improve cattle distribution and prevent regrazing of plants. Additionally, the time spent in each pasture would be reduced. Both of these actions are anticipated to improve vegetation height and pronghorn fawning habitat.

7. Grazing intensity and duration under the proposed action reduces vegetation height to less than what is needed and with the growing season passed there is no opportunity for plants to regrow to adequate height before winter.

There is an opportunity for vegetation to grow when livestock leave the pastures. Only one pasture on each allotment would receive late season grazing, and those pastures would not receive more utilization than allowable. In addition, pastures used last in the grazing season are rotated each year.

8. Pit tanks may reduce water for vegetation elsewhere.

Response: The water that is diverted to roadside pit tanks is water that drains off of the adjacent roads. This water is normally diverted off to the sides of the road via water bars. The pit tanks catch this water, making it available for livestock and wildlife.

9. A water lane into the wetland for stock water when soils are wet would have a direct effect on how long the area stays wet.

There is no “water lane.” Under the proposed action, livestock would not use the Buggy Wheel Pasture would not have access to the tank when soils are wet. Buggy Wheel Pasture is only used ten to fifteen days per year for shipping, holding, and working cattle.

10. The Cinnamon teal that nest in these wetlands build their nests in the upland vegetation within 100 meters of the high water mark (Myers 1982), therefore a larger area should be fenced to exclude cattle.

In the thesis referenced by the commenter, Myers (1982) states that 30% (17 of 57) of the cinnamon teal nests were on stock tank dikes (p. 38) and 83 % of nests were within 50 m of water, not the high water mark. Additionally, the teal nests on stock tank dikes were more successful than nests constructed elsewhere. The current cattle exclusion at Duck Lake fences almost 80% of the area containing hydric soils, which prevents cattle from accessing and impacting the high quality teal nesting habitat in the area.

12. The extended grazing season could be used by permittees to graze more cattle

Response: Decisions regarding season of use and number of cattle authorized are made by the District, not the permittee. Also, with a maximum number of authorized AUMs, an extended season of use would result in grazing fewer cattle.

13. Concern that the allowable utilization levels are not based on “scientific evidence”.

Response: Allowable use levels are set conservatively at levels that have been shown to be sustainable. These levels are adjusted as needed to meet different resource objectives (e.g. allowable utilization levels for Mexican spotted owl habitat).

14. Concern that without mid-point monitoring; it would be difficult to determine when to rotate cattle.

Response: Mid-point monitoring would be conducted to assess grazing intensity and to identify appropriate timing of cattle rotation through pastures (See Monitoring page 9).

15. Concern that annual qualitative “ocular monitoring” can not inform management adjustments in time to make useful changes. Commenter suggests the use of quantitative methods.

Response: Ocular monitoring is both quantitative and qualitative. Rangeland Management Specialists use experience, training, and periodic calibration (quantitative clipping and weighing) to assess utilization levels and forage production. Because forage production and utilization needs to be assessed over large areas that vary greatly, ocular estimates are reasonably accurate, and much more efficient than exclusive use of quantitative methods. Ocular monitoring is conducted periodically throughout the grazing season (See Monitoring page 9).

16. Concern that the Proposed Action does not address drought management.

Response: The proposed action does address drought management by providing administrative flexibility in adjusting livestock numbers, season of use as needed in order to respond to current conditions, improve range conditions, and attain desired resource conditions over time. The District Rangeland Management Specialists authorize lower numbers and on/off dates as needed through the annual operating instructions (AOI). The last few years have been dry and the range was not able to support permitted numbers. Therefore, cattle numbers and grazing periods were reduced.

17. Concern that water developments are expensive.

Response: Pit tanks are one of the least expensive water developments and they are usually paid for out of “range betterment funds.” These funds are generated from grazing fees and are set aside for range improvements. Additionally, water development projects often have opportunities for cost-sharing with permittees and/or partners.

18. Concern that grazing may not be is the best use of the publicly owned forest resources and that authorization of grazing gives priority to permittees economic concern (the few) over other concerns for wildlife, watershed, riparian areas, and the U.S. taxpayer (the many).

Response: This concern is outside the scope of this project-level decision. Land uses are determined at the Forest planning level.

19. Because cattle do not distribute themselves evenly, utilization levels would be exceeded in parts of the Allotment.

Response: Allowable utilization is averaged across the pastures. Utilization monitoring is conducted in “key areas,” which are normally ¼ to 1 mile from water. While they do not receive the heaviest use; they are located in areas with productive soils (containing more forage) and readily accessible to cattle (level to intermediate slopes), and typically receive higher than average use. In addition, the Proposed Action contains several changes from current management designed to improve livestock distribution on the allotments.

20. Range Management does not monitor or promote forbs on NFS lands.

Response: The pace transects and Parker clusters do monitor perennial forbs. Annual forbs are not monitored because they are highly variable and are more of an indicator of precipitation than management. In wet years there are an abundance of annual forbs, and in dry years their number are significantly reduced.

Appendix 3. Best Management Practices for Soil and Watershed Conservation

Best Management Practices (BMPs) have been developed by the State of Arizona and the USDA-Forest Service, Region 3, to be effective, practicable means of preventing or reducing soil erosion and water quality degradation. General guidance for BMPs is found in the Region 3 Soil & Water Conservation Practices Handbook (1990). Specific measures are developed during the allotment planning process and are included in the proposed action and associated mitigation measures.

Range Management BMPs

1. Controlling Livestock Numbers and Season of Use

The objective is to *safeguard water and soil resources* under sustained forage production. Manage forage utilization by livestock to *maintain healthy ecosystems* for all resource objectives.

This is implemented by performing periodic field checks to identify necessary mid-course adjustments to the year's permitted season and livestock numbers. These checks include:

- a. Range readiness evaluations to assure that soils are not too wet and that sufficient forage growth has occurred.
- b. Stock counts to assure that only permitted livestock enter the allotment and that animals are in the correct pastures.
- c. Monitor forage use to assure that seasonal utilization standards are not exceeded and that pasture moves are made earlier than planned when necessary.
- d. Verifying soil and vegetation condition and trend.
- e. Assessment of streambanks, seeps, springs, and wetlands to assure soils are not being degraded and contributing excessive sediment to water courses.

Livestock numbers and seasons of use may be changed annually to reflect current climatic conditions (drought, flooding, cool weather that slows plant development).

2. Controlling Livestock Distribution

The objective is to sustain forage production and allow utilization by livestock while *protecting soil and water resources*, and *maintaining healthy ecosystems for wildlife and other resources*.

Livestock use within allotments is typically not uniform due to variations in topography, water availability, and vegetation type and condition. Use techniques to improve distribution, or to lessen impacts on areas which are sensitive or which would normally be over-used. Techniques for changing distribution patterns are:

- a. fencing
- b. seasonal grazing
- c. develop water in areas that receive little use
- d. close off water when utilization standards have been met
- e. use salt or other supplements to attract livestock to less sensitive or less used areas
- f. prevent intensive livestock grazing and concentrated livestock use on soils that have low bearing strength when they are wet

3. Rangeland Improvements

The objective is to improve, maintain, or restore rangeland resources, including soil and water. Construct improvements to provide protection to resources other than livestock. Improvements include:

- a. fencing to improve cattle distribution and control access to sites of concern
- b. develop watering sites to relieve over-use at existing waters
- c. repair, replace, or remove improvements that are causing unsustainable soil erosion or water quality degradation.

4. Determine grazing capability of lands

The objective is to maintain or improve soil stability, soil productivity, and water quality by grazing the land within its sustainable capability. This is addressed by designating only land with soils in stable condition as “full capability” range. Lands with unstable or impaired soils should be designated as “partial” or “no capacity”.

Soil condition classes are determined based on the relationship of “current” and “tolerance” soil loss rates, as described in the Terrestrial Ecosystem Survey. Only soils that have “current” rates less than the “tolerance” rate are considered stable.

Appendix 4 • Noxious Weed Prevention and Control Measures

Integrated Weed Management Practices (excerpted from Coconino, Kaibab, & Prescott National Forests Noxious and Invasive Weed Strategic Plan 1998, Amended 2002)	
RANGE MANAGEMENT	
Objective	Best Management Practice
<p>RM-1. Consider weed prevention and control practices in the management of grazing allotments.</p>	<p>1.1 – Include weed prevention practices, inspection and reporting direction, and provisions for inspection of livestock concentration areas in allotment management plans and annual operating instructions for active grazing allotments.</p> <p>1.2 – For each grazing allotment containing existing weed infestations, include prevention practices focused on preventing weed spread and cooperative management of weeds in the annual operating instructions. Prevention practices may include, but are not limited to:</p> <ul style="list-style-type: none"> Maintaining healthy vegetation Preventing weed seed transportation Minimize potential ground disturbance - altering season of use or exclusion Weed control methods Revegetation Inspection and Monitoring Reporting Education
<p>RM-2. Minimize transport of weed seed into and within allotments.</p>	<p>2.1 – If livestock are potentially a contributing factor to seed spread, schedule units with existing weed infestations to be treated prior to seed set before allowing livestock on those units. Schedule these infested units to be the last in the rotation.</p> <p>2.2 – If livestock were transported from a weed-infested area, corral livestock with weed-free feed, and annually inspect and treat allotment entry units for new weed infestations.</p> <p>2.3 – Designate pastures as unsuitable range to livestock grazing when infested to the degree that livestock grazing will continue to either exacerbate the condition on site or contribute to weed seed spread.</p>

<p>RM-3. Maintain healthy, desirable vegetation that is resistant to weed establishment.</p>	<p>3.1 – Through the allotment management plan or annual operating instructions, manage the timing, intensity (utilization), duration, and frequency of livestock activities associated with harvest of forage and browse resources to maintain the vigor of desirable plant species and retain live plant cover and litter.</p> <p>3.2 – Manage livestock grazing on restoration areas to ensure that vegetation is well established. This may involve exclusion for a period of time consistent with site objectives and conditions. Consider practices to minimize wildlife grazing on the areas if needed.</p>
<p>RM-4. Minimize ground disturbances.</p>	<p>4.1 – Include weed prevention practices that reduce ground disturbance in allotment management plans and annual operating instructions. Consider for example: changes in the timing, intensity, duration, or frequency of livestock use; location and changes in salt grounds; restoration or protection of watering sites; and restoration of yarding/loafing areas, corrals, and other areas of concentrated livestock use.</p> <p>4.2 – Inspect known areas of concentrated livestock use for weed invasion. Inventory and manage new infestations.</p>
<p>RM-5. Promote weed awareness and prevention efforts among range permittees.</p>	<p>5.1 – Use education programs or annual operating instructions to increase weed awareness and prevent weed spread associated with permittees’ livestock management practices.</p> <p>5.2 – To aid in their participation in allotment weed control programs, encourage permittees to become certified pesticide use applicators.</p>

Appendix 5 Species that would not have habitat or population trends affected by either of the alternatives and associated rationale.

Common Name	Scientific Name	Status	Rationale
Amphibians			
Lowland Leopard Frog	<i>Rana yavapaiensis</i>	Sensitive	Range does not overlap – occurs below 5,500 feet elevation and is primarily found below 3,000 feet
Northern Leopard Frog	<i>Rana pipiens</i>	Sensitive	Not likely to occur within allotments - over 105 surveys at 52 different locations on the District since 1990, with only four known recent occurrences. The closest known historical occurrence of the species is located approx. 7 miles to the southwest of the allotments. Found in fresh-water ponds or streams that typically hold water year-round and have aquatic vegetation. A few tanks on the allotments hold water year-round, though they are generally depauperate of aquatic vegetation, providing only marginal potential habitat for this species.
Birds			
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Sensitive	No impacts to habitat or population trends – nests on cliffs that would incur little to no use by livestock; forages on a variety of bird species, including doves, pigeons, shorebirds, waterfowl, and passerines, that use a variety of habitats, many of which would incur little to no use by livestock grazing
Arizona woodpecker	<i>Picoides arizonae</i>	FWS Bird of Conservation Concern (BCC)	Range does not overlap-found in extreme southeastern Arizona.
Baird's sparrow	<i>Ammodramus bairdii</i>	BCC	Range does not overlap-found in extreme southeastern Arizona.
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Threatened	No effect - breeding range does not overlap; winter roost site habitat would not be affected by livestock grazing; little seasonal overlap of livestock grazing and winter occupation by bald eagles, and opportunistic nature of bald eagle foraging and winter perching
Bell's vireo	<i>Vireo bellii</i>	BCC	No habitat in project area-breeds in riparian associated habitat with dense brush, willow thickets, mesquite, streamside thickets and scrub oak

Common Name	Scientific Name	Status	Rationale
Bendire's Thrasher	<i>Toxostoma bendirei</i>	BCC	No impacts to habitat or population trends – uses sagebrush and scattered junipers; no sagebrush occurs on either allotment and junipers would not be affected by livestock grazing
Black-chinned sparrow	<i>Spizella atrogularis</i>	BCC	No habitat found in project area- found in chaparral, sagebrush, and arid scrub habitats.
Black Swift	<i>Cypseloides niger</i>	BCC	No impacts to habitat or population trends – forages over forests and open areas and breeds in cliffs near waterfalls that do not occur within or near the allotments
Black-Throated Gray Warbler	<i>Dendroica nigrescens</i>	BCC; AZ Partners in Flight Priority Bird (PFPB) Species of pinyon-juniper habitat	No impacts to habitat or population trends – uses pinyon pines and junipers that would not be affected by livestock grazing
Botteri's sparrow	<i>Aimophila botterii</i>	BCC	Range does not overlap project area- found in southeastern Arizona and further south.
Broad-billed hummingbird	<i>Cynathus latirostris</i>	BCC	Range does not overlap project area- found in southeastern Arizona and further south.
California Condor	<i>Gymnogyps californianus</i>	Endangered, Experimental/ Nonessential (Northern Arizona)	Range does not overlap – this experimental population occurs within the Vermillion Cliffs, Paria Plateau, and areas surrounding the Grand Canyon
Common Black Hawk	<i>Buteogallus anthracinus</i>	Sensitive	No potential habitat - occurs in lowland forest, especially cottonwoods, along rivers and streams
Cordilleran Flycatcher	<i>Empidonax occidentalis</i>	AZ PFPB Species of pine habitat	No impacts to habitat or population trends – uses pine or aspen forests with substantial canopy cover that would not be affected by livestock grazing
Costa's hummingbird	<i>Calypte costae</i>	BCC	Range does not overlap – occurs in southern Arizona
Crissal Thrasher	<i>Toxostoma crissale</i>	BCC	No potential habitat – occurs in chaparral habitat
Elegant trogon	<i>Trogon elegans</i>	BCC	Range does not overlap- found in southern Arizona and northern Mexico
Elf owl	<i>Micrathene whitneyi</i>	BCC	No habitat in allotments- found in desert-wash woodland and Arizona walnut habitat

Common Name	Scientific Name	Status	Rationale
Flammulated Owl	<i>Otus flammeolus</i>	BCC	No impacts to habitat or population trends – uses mature montane forest, usually with an open canopy with yellow pine, brush, and saplings and often on ridges and upper slopes that would not be affected by livestock grazing
Gilded flicker	<i>Colaptes chrysoides</i>	BCC	Range does not overlap – breeds in southern Arizona
Grace's Warbler	<i>Dendroica graciae</i>	BCC	No impacts to habitat or population trends – uses ponderosa pine and Gambel oak trees that would not be affected by livestock grazing
Grasshopper sparrow	<i>Ammodramus savannarum</i>	BCC	Range does not overlap-found in extreme southern Arizona
Gray Flycatcher	<i>Empidonax wrightii</i>	AZ PFPB Species of pinyon-juniper habitat	No impacts to habitat or population trends – ponderosa pine, pinyon pine, and juniper trees that would not be affected by livestock grazing
Gray hawk	<i>Buteo nitidus</i>	BCC	No habitat found on allotments-found in wooded watercourses
Gray Vireo	<i>Vireo vicinior</i>	BCC; AZ PFPB Species of pinyon-juniper habitat	No impacts to habitat or population trends – uses shrubby vegetation and junipers that would not be affected by livestock grazing
Hairy Woodpecker	<i>Picoides villosus</i>	MIS of snag habitat in ponderosa pine, mixed conifer, and spruce fir	No impacts to habitat or population trends – uses snags in ponderosa pine, mixed conifer, and spruce fir forests that would not be affected by livestock grazing
Juniper Titmouse	<i>Baeolophus griseus</i>	AZ PFPB Species of pinyon-juniper habitat	No impacts to habitat or population trends – uses tall, moderately dense pinyon pine and juniper habitat that would not be affected by livestock grazing
Lark bunting	<i>Calamospiza melanocorys</i>	BCC	No impacts to habitat or population trends- does not breed in northern Arizona, winters in southern Arizona
Lewis' Woodpecker	<i>Melanerpes lewis</i>	BCC	No impacts to habitat or population trends – uses old growth ponderosa pine, Gambel oak, or pinyon-pine trees or snags that would not be affected by livestock grazing
Lucifer hummingbird	<i>Calothorax lucifer</i>	BCC	Range does not overlap-found in extreme southeastern Arizona
Lucy's Warbler	<i>Vermivora luciae</i>	MIS of late seral, low elevation (<7,000 feet) riparian habitat	No potential habitat – occurs in riparian cottonwood and willow habitat in mountain foothills and desert riparian mesquite

Common Name	Scientific Name	Status	Rationale
Marbled godwit	<i>Limosa fedoa</i>	BCC	No impacts to habitat or population trends- does not breed in northern Arizona, migrant, and shoreline not affected by livestock grazing.
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened	No impacts to habitat or population trends - uses mixed conifer and pine/oak habitat that would not be significantly affected by livestock grazing. We received concurrence from the USDI Fish and Wildlife Service with our not-likely to adversely affect determination for this species and its critical habitat for the proposed action on June 3, 2005. This determination was based on 1) the grazing recommendations of the MSO Recovery Plan have been incorporated into the proposed project, 2) the proposed action follows the March 2004 Framework for Streamlining Informal Consultation for Livestock Grazing Activities (Forest Service Region 3 grazing guidance criteria). 3) proposed utilization levels, grazing strategies, and compliance monitoring are expected to maintain high vegetative diversity, maintain prey species habitat, and provide enough residual biomass to carry fire, and 4) the primary constituent elements of MSO critical habitat would not be adversely affected. Grazing, as proposed, would maintain a wide range of tree and plant species including hardwoods, and adequate levels of residual plant cover to maintain fruits, seeds, and regeneration.
Mountain Plover	<i>Charadrius montanus</i>	BCC	Breeding and wintering ranges do not overlap – breeding range is in eastern New Mexico; winter range includes southwestern Arizona, central valley of California, and Baja California
Northern beardless tyrannulet	<i>Camptostoma imberbe</i>	BCC	No potential habitat on allotments- occurs in arid scrub, thickets, mesquite, or open riparian woodland
Olive-Sided Flycatcher	<i>Contopus borealis</i>	AZ PFPB Species of mixed conifer and pine habitats	No impacts to habitat or population trends – uses high-elevation ponderosa pine trees that would not be affected by livestock grazing

Common Name	Scientific Name	Status	Rationale
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	BCC; AZ PFPB Species of pinyon-juniper habitat	No impacts to habitat or population trends – uses pinyon pines, junipers, ponderosa pines, and oak trees that would not be affected by livestock grazing
Purple Martin	<i>Progne subis Linnaeus</i>	AZ PFPB Species of pine habitat	No impacts to habitat or population trends – uses snags that would not be affected by livestock grazing
Pygmy Nuthatch	<i>Sitta pygmaea</i>	MIS of late seral ponderosa pine	No impacts to habitat or population trends – uses late seral ponderosa pine snags that would not be affected by livestock grazing
Red-Naped Sapsucker	<i>Sphyrapicus nuchalis</i>	MIS of late seral aspen and snags in aspen	No impacts to habitat or population trends – uses snags in late seral aspen forests that would not be affected by livestock grazing. Very little to no aspen habitat on the Davenport Allotment; no habitat on the Homestead Allotment
Rufous-winged sparrow	<i>Aimophila carpalis</i>	BCC	No potential habitat on allotments- found in open, flat grassy areas with scattered thorn bush, mesquite, or cholla.
Sage Sparrow	<i>Amphispiza belli</i>	BCC	No potential habitat – occurs in sagebrush and associated habitats
Short-Eared Owl	<i>Asio flammeus</i>	BCC	No potential habitat - occurs in fresh or saltwater marshes, bogs, dunes, or tundra
Snowy Plover	<i>Charadrius alexandrinus</i>	Coastal Subspecies Threatened; BCC	No impacts to habitat or population trends - Only two breeding records from AZ, one in SE Arizona and the other in western AZ. Winters in western Mexico, resident year round along California coast.
Solitary sandpiper	<i>Tringa solitaria</i>	BCC	No impacts to habitat or population trends- does not breed in northern Arizona, migrant, and shoreline not affected by livestock grazing.
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Endangered	No potential habitat – occurs along rivers, streams, and other wetlands with dense riparian vegetation
Sprague's Pipit	<i>Anthus spragueii</i>	BCC	Breeding and wintering ranges do not overlap – does not breed in Arizona; winters in southern Arizona
Varied bunting	<i>Passerina versicolor</i>	BCC	Range does not overlap- found in southern Arizona only
Virginia's Warbler	<i>Vermivora virginiae</i>	BCC	No impacts to habitat or population trends – uses ponderosa pine, Gambel oak, pinyon pine, and juniper trees that would not be affected by livestock grazing
Whiskered screech owl	<i>Megascops trichopsis</i>	BCC	Range does not overlap- found in southeastern Arizona and south

Common Name	Scientific Name	Status	Rationale
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>	BCC	No impacts to habitat or population trends – uses aspen or ponderosa pine trees that would not be affected by livestock grazing
Wilson's phalarope	<i>Phalaropus tricolor</i>	BCC	No impacts to habitat or population trends- does not breed in northern Arizona, migrant, and shoreline not affected by livestock grazing.
Yellow-Billed Cuckoo	<i>Coccyzus americanus</i>	BCC	No potential habitat – occurs in large blocks of riparian woodlands (cottonwood, willow, or tamarisk)
Yellow Breasted Chat	<i>Icteria virens</i>	MIS of late seral, low elevation (<7,000 feet) riparian habitat	No potential habitat – occurs in riparian associated dense shrubby habitat
Yuma Rufous-Crowned Sparrow	<i>Aimophila ruficeps rupicola</i>	Sensitive	No impacts to habitat or population trends – uses pinyon pine and juniper trees that would not be affected by livestock grazing
Fish			
Apache (Arizona) Trout	<i>Oncorhynchus apache</i>	Threatened	Range does not overlap and no potential habitat – restricted to perennial streams of upper Salt, Blue, and Little Colorado drainages and introduced to North Canyon and Grant Creek
Little Colorado Spinedace	<i>Lepidomeda vittata</i>	Threatened	Range does not overlap and no potential habitat – occurs in north-flowing tributaries of the Little Colorado River with slow to moderate water currents
Spikedace	<i>Meda fulgida</i>	Threatened, Critical Habitat	No potential habitat – occurs in moderate to large perennial streams with moderate to swift water velocities. No effects to Critical Habitat Complex 1 (Verde River) owing to the large distance (approximately 35 miles) of the Complex to the two allotments.
Invertebrates			
A Tiger Beetle	<i>Amglycheila picolominii</i>	Sensitive	No impacts to habitat or population trends – not known to occur within the allotments; uses bare rock, talus, and scree that would not be affected by livestock grazing

Common Name	Scientific Name	Status	Rationale
A Tiger Beetle	<i>Cicindela purpurea cimarrona</i>	Sensitive	No impacts to habitat or population trends likely – not known to occur within the allotments; family uses open, sunny situations, especially dry paths, fields, and sandy areas; potential balance in positive (e.g., promoting open situations and dry paths) and negative effects (e.g., trampling of larval burrows) to individuals
Aquatic Macroinvertebrates	Several species – Mayflies, Stoneflies, Caddisflies	MIS of late seral riparian habitats	No impacts to habitat or population trends – represented habitat of healthy, aerated streams which do not exist within the allotments.
Arizona Snaketail	<i>Ophiogomphus arizonicus</i>	Sensitive	No potential habitat – occurs along the sides of perennial streams
Early elfin butterfly	<i>Incisalia (Callophrys) fotis</i>	Sensitive	No potential habitat – occurs in desert mountains and canyons in pinyon pine or pinyon-juniper habitat with substantial cliffrose
Maricopa tiger beetle	<i>Cicindela oregano maricopa</i>	Sensitive	No potential habitat - associated with sandy, riparian situations, such as stream bands, edges, and sand bars
Mojave giant skipper	<i>Agathymus alliae</i>	Sensitive	No potential habitat -found in open pine woodland canyons and desert with <i>Agave utahensis</i>
Mountain Silverspot Butterfly	<i>Speyeria Nokomis nitocris</i>	Sensitive	No potential habitat – occurs in open seepage areas, which do not exist within the allotments
Navajo Jerusalem Cricket	<i>Stenopelmatus navajo</i>	Sensitive	No impacts to habitat or population trends – not known to occur within the allotment; occurs on hillsides under rocks that are not likely to be affected by livestock grazing
Neumogen's Giant Skipper	<i>Agathymus neumoegeni</i>	Sensitive	No potential habitat – uses dry, open woodlands or shrublands with <i>Agave parryi</i>
Obsolete Viceroy Butterfly	<i>Limenitis archippus obsoleta</i>	Sensitive	No potential habitat – occurs in riparian canyons and desert arroyos
Pima orange tip	<i>Anthocharis pima</i>	Sensitive	Range does not overlap – occurs below about 5,900 feet in semi-open to open desert, chaparral, woodlands, canyons, glades, or ridgeline meadows with its host
Spotted Skipperling	<i>Piruna polingii</i>	Sensitive	No potential habitat – occurs in moist meadows in coniferous and mixed woodlands; which do not occur on the allotments
Mammals			
Allen's Lappet-Browed Bat	<i>Idionycteris phyllotis</i>	Local Concern	No impacts to habitat or population trends – uses ponderosa pine snags and trees that would not be affected by livestock grazing

Common Name	Scientific Name	Status	Rationale
Black-Footed Ferret	<i>Mustela nigripes</i>	Endangered	No potential habitat – one female ferret and her litter are estimated to require approximately 598 acres of Gunnison's prairie dog habitat; no Gunnison's prairie dog towns greater than 200 acres exist within the allotments
Mule Deer	<i>Odocoileus hemionus</i>	MIS	No impacts to habitat or population trends – forage items mostly consist of woody browse, with less than 5% grasses in their diet; woody browse occurs on steeper slopes on the allotments, which would not be affected by livestock grazing; deer prefer upper slopes, ridgetops, and steep slopes greater than 30% while livestock prefer lower finger ridges, lower slopes, and slopes less than 30%
Spotted Bat	<i>Euderma maculatum</i>	Local Concern	No impacts to habitat or population trends – roosts in caves and rock crevices near water; forages in open ponderosa pine forest that is not likely to be affected by the alternatives
Tassel Eared (Abert's) Squirrel	<i>Sciurus aberti</i>	MIS of early seral ponderosa pine	No impacts to habitat or population trends – uses early seral ponderosa pine forest that would not be affected by livestock grazing
Townsend's Big-Eared Bat	<i>Corynorhinus townsendii townsendii</i>	Local Concern	No impacts to habitat or population trends – roosts in coniferous forests and tree cavities that would not be affected by livestock grazing
Western Red Bat	<i>Lasiurus blossevillii</i>	Local Concern	No potential habitat - occurs in riparian habitat with cottonwoods, oaks, and sycamores
Snails			
Montezuma Well Springsnail	<i>Pyrgulopsis montezumensis</i>	Sensitive	No potential habitat and range not likely to overlap – occurs in perennial springs and spring brooks; benthic; found in the Upper Verde Watershed in Yavapai County; the <i>Pyrgulopsis</i> genus tends to be highly endemic
Niobrara Ambersnail	<i>Oxyloma haydeni haydeni</i>	Sensitive	No potential habitat – occurs in perennial riverside springs with wetland vegetation