



United States
Agriculture

Forest
Service

Southwestern
Region



Environmental Assessment for the Greens Peak, Hall, and Cerro Trigo Allotment Management Plans

***Apache-Sitgreaves National
Forests,
Springerville Ranger District,
Apache County, AZ.***

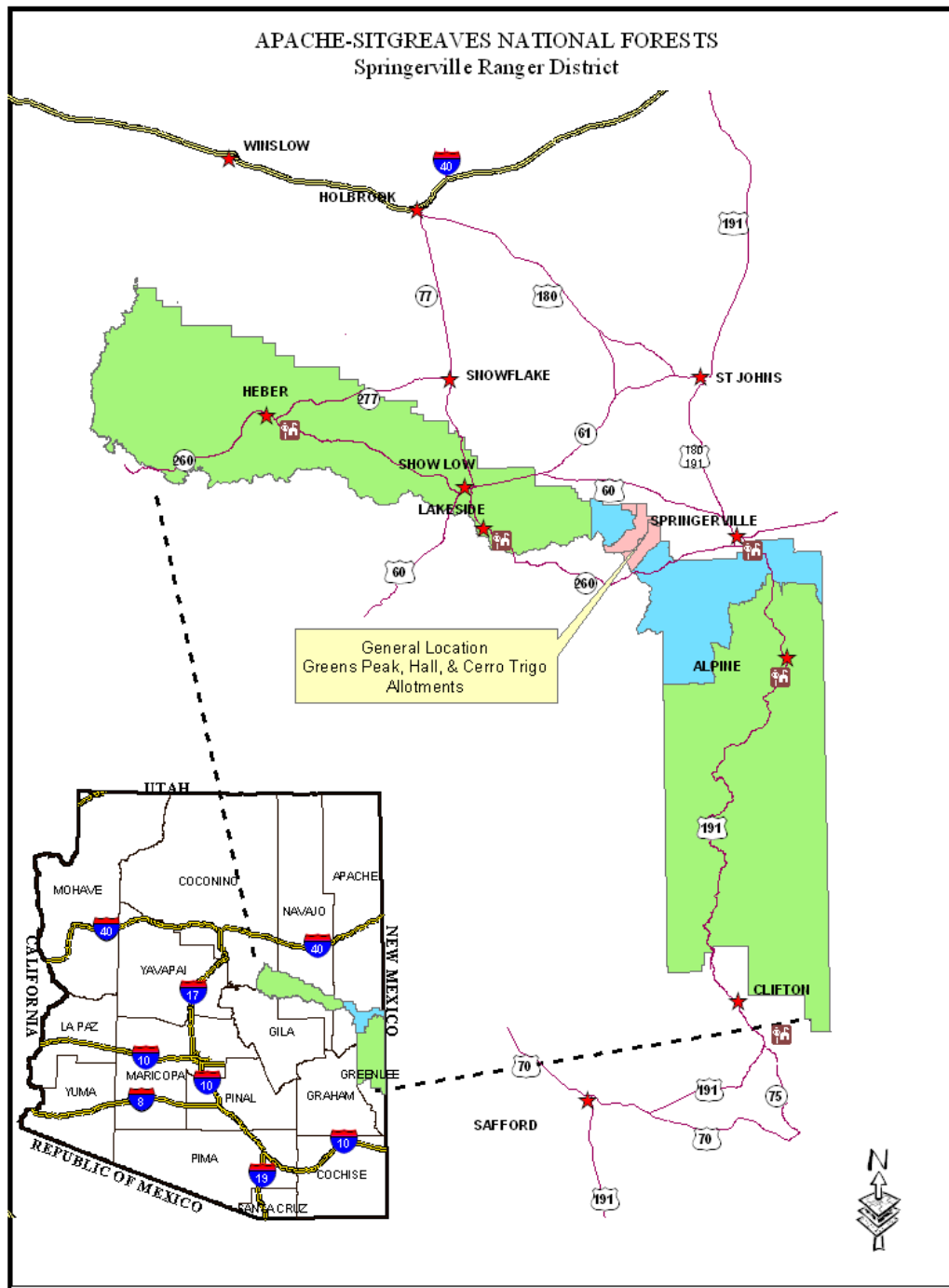


Figure A – Project Location

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July 2012

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Chapter 1 – Purpose and Need

Background

The Forest Service has prepared this environmental assessment (EA) in compliance with the National Environmental Policy Act (NEPA), the 1995 Recission Act (P.L. 104-1995) and other relevant federal and state laws and regulations. This environmental assessment discloses the direct, indirect, and cumulative environmental effects that would result from the proposed action and alternatives.

Chapter 1 – Purpose and Need: The section includes the purpose of and need for the project, background on the allotments, and a summary of management direction from the Forest Land and Resources Management Plan (LMP). This section also details how the Forest Service informed the public of the proposal how the public responded, and what significant issues and other concerns were identified for the analysis.

Chapter 2 - Alternatives: This section provides descriptions of the agency’s proposed action, as modified following public input, as well as the No Action alternative. The action alternative was developed based on significant issues raised by stakeholders, the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

Chapter 3 - Environmental Consequences: This section describes the environmental effects of implementing the alternatives analyzed in detail. 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 of the other alternatives that follow.

Chapter 4 – Consultation and Coordination: This section provides a list of preparers, and agencies consulted during the development of the environmental assessment.

Chapter 5 -- Appendices: The appendices provide more detailed information to support the analyses presented in the environmental assessment. Appendix A is a monitoring strategy for the three allotments. Appendix B is a list of Best Management Practices incorporated into the alternatives.

Chapter 6 – References Cited

Throughout this EA, references to supporting documentation found in the project record are shown in parentheses. Supporting documentation, including more detailed analyses of project area resources, may be found in the project planning record located at the Springerville Ranger District in Springerville, Arizona.

Purpose and Need for Action

The Greens Peak, Hall and Cerro Trigo allotments are undergoing an environmental analysis of grazing use, to meet the requirements of the Rescission Act of 1995. The purpose of this project is to authorize livestock grazing in a manner that maintains and/or moves the areas within the allotments toward Apache-Sitgreaves National Forests Land and Resource Management Plan (LMP or “forest plan”) desired conditions. While the majority of areas within the three allotments are currently meeting desired conditions, there is a need to improve upon the current management in specific areas on each allotment. Current management is not completely resulting in conditions meeting or moving toward forest plan desired conditions for soil, watershed and vegetative condition in those specific areas. Part of the purpose for this analysis was that the two grazing

permittees of the Hall allotment proposed splitting that allotment and incorporating the two halves into their other separate grazing operations on adjacent Forest Service allotments, with the goal of expanding flexibility and adaptability of their two overall grazing operations and reducing grazing pressure on the area of Hall allotment.

-- Where consistent with other multiple use goals and objectives, there is Congressional intent to allow grazing on suitable lands. (*Multiple Use and Sustained Yield act of 1960, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976, Rescission Act of 1995*;

-- It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for grazing consistent with land management plans. (*FSM 2203.1, 36 CFR 22.2 (c)*);

-- It is Forest Service policy to continue contributions to the economic and social well being of the American people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood. (*FSM 2202.1*);

-- There is a need for change in livestock management in the three allotments, to assist resource conditions in specific areas to move toward the Apache-Sitgreaves National Forest Land and Resources Management Plan desired conditions, to the extent larger environmental trends permit (*Plan to Project documents for the allotments, 2009*).

Existing Conditions

The Greens Peak, Hall and Cerro Trigo Allotments are located on the Springerville Ranger District of the Apache-Sitgreaves National Forests (Figure A).

Range Capability

Each allotment's overall suitability for livestock grazing was determined in the 1987 forest plan (LMP 1987). As part of this analysis, the interdisciplinary team followed direction in the Southwestern Region Range Analysis Guide (R3 1997) to refine suitability and capability for the three allotments. Based on an analysis of soil types, forage production and slopes within the allotments along with prior NEPA decisions, the entire three allotment area is considered fully or potentially capable, except for areas in all three allotments rating as not capable, totaling approximately 6,325 acres (range specialist report, 2010).

Greens Peak Allotment

The Greens Peak Allotment consists of 11,824 acres of high elevation grasslands intermixed with stands of mixed conifer on the rockier slopes and hillsides. The grasslands consist mostly of Arizona fescue, mountain muhly, sheep fescue, pine dropseed, sedges and Erigeron species. Elevation ranges from 8,000 to 9,000 feet. Approximately 70 acres are considered wet meadow, consisting of mainly sedges, tufted hairgrass, and Kentucky bluegrass. There is a small amount of pinyon-juniper habitat on the north end of the allotment.

Livestock grazing has occurred within the project area since at least the 1870s. Actual livestock use for a 20 year period from 1989 to 2008 shows variability as numbers and season were adjusted depending on resource conditions (see project record). The twenty year average animal unit months (AUMs) grazed was 1,925, with 1,409 (about 276 cows with calves) being the minimum and 2,296 (about 450 cows with calves) the maximum.

The allotment is divided into 5 pastures. There are five permittees with separate term grazing permits, whose on-off dates run from May 15 to October 31 (Table 1). The allotment is currently managed with one combined herd under a deferred rotation grazing system. Utilization monitoring over the past nine years indicates conservative to moderate use, depending on the year and pasture. Some pre-livestock checks reveal moderate to heavy use by elk in Atascacita and Carnero, which are lower elevation pastures. Those same two pastures have had a history of being grazed at the same early season most if not all years, due to higher pastures not being range ready in mid to late May. That can put extra grazing pressure on desirable grasses at a sensitive time of year.

Hall Allotment

Hall allotment is located 11 miles west of Springerville, Arizona. The Hall Allotment consists of 14,963 acres with elevation ranging from 7,700 to 8,257 feet. The dominant vegetation type is ponderosa pine (34%) with patches of aspen and spruce-fire on knolls. High elevation grassland (20%) among mixed conifer hills (20%) also covers large portions. The high elevation grasslands are dominated by Arizona fescue and mountain muhly. Bluegrasses and sedges are the most common species in the wet meadows. The northern and lower elevation pastures contain pinyon-juniper transition dominated by Blue Grama grass.

Livestock grazing has occurred within the project area since at least the 1870s. The twenty year average of AUMs grazed from 1989 to 2008 was 1,924, with 682 (about 149 cows with calves) being the minimum and 2,529 (about 553 cows with calves) the maximum run during that time. The allotment is divided into 6 pastures. There are two permittees whose on and off dates run from June 1 to October 15 (Table 3). The allotment is currently managed with one herd under a deferred rotation grazing system. Utilization monitoring over the last several years indicates light to conservative use, depending on the year and pasture.

Cerro Trigo Allotment

Cerro Trigo Allotment consists of 2,582 acres that adjoin Hall Allotment – two pastures are to the east and two are to the west of that allotment. The allotment acreage includes 156 acres of permittee-owned private land managed along with and in the same way as the National Forest System lands, with a private land term permit for seven cows with calves. Elevation ranges from 7,700 ft to 8,257 feet. The dominant vegetation type is grassland associated with scattered ponderosa pine and mixed conifer forest on hillsides. The grasslands are dominated by Arizona fescue and mountain muhly. Bluegrasses and sedges are the most common species in the wet meadows.

The pastures making up the current Cerro Trigo Allotment were private ranch land until they were included in a land exchange about 1997, became National Forest System land and developed into a new allotment.

Actual use for a 10 year period from 1999 to 2008 has been compiled and shows variability as adjustment in numbers and season were made depending on resource conditions (see project record). The ten year average AUMs grazed was 173, with zero being the minimum and 197 (48 cows with calves, including the private land cattle) the maximum run during that time.

The 2,561 ac allotment is divided into 4 pastures. The allotment is currently managed with one herd under a deferred rotation grazing system. Utilization monitoring over the last several years indicates light to conservative use.

Desired Conditions

Desired conditions are the long-term management goals for a particular area. These goals include consideration of commodity production as well as other resource management requirements. Some portions of the allotments may already be in the desired condition, while others may require years of management to reach the stated objectives. Some objectives may not be met within the time frame of a 10-year AMP. Moreover, due to resource condition, budget constraints or other factors, some objectives may never be met. Desired future conditions, along with site-specific objectives, and monitoring parameters for vegetation resources, soils, and riparian were developed (Table 7).

Table 1: Greens Peak, Hall, Cerro Trigo Complex site-specific objectives.

Resource	Desired condition	Site-Specific Objective	Monitoring Parameters
Vegetation	Desirable and intermediate forage plants have high vigor and become more abundant, cumulatively, than undesirable species	Herbaceous vegetative composition is moving toward a high similarity to the Potential Natural Community, to the extent existing tree canopy cover permits. Note: Some TES map units shown as having the potential vegetation as grasslands have excessive tree cover, which interferes with attaining high similarity with potential herbaceous cover and diversity. Addressing tree canopy levels is beyond the scope of this decision.	Plant Composition, similarity with PNV, by TES map unit
Soils	Plant cover and litter should be well distributed to protect soil with minimum bare spaces present	The percent ground cover is at or above the TES percent current surface component for each Map Unit.	Plant and litter cover
Riparian	Riparian areas in proper functioning condition along entire stream length where possible	Diverse age classes and riparian dependent plant species composition; adequate vegetation cover to protect stream banks from erosion	Proper Functioning Condition surveys Stubble heights in areas not yet meeting PFC

Difference between Existing and Desired Conditions:

- Riparian Condition: Some specific riparian reaches rated in *unsatisfactory* condition occur on the Greens Peak and Hall Allotments. Desired condition is for all riparian areas on these allotments to be rated in satisfactory condition where potential exists.

Satisfactory condition is defined as meeting the criteria for a Proper Function Condition (PFC) determination. The specific reaches are identified in the Proposed Action.

- **Bare Soil:** In some specific areas of the allotments monitored with permanent or paced transects, the amount of bare soil is higher than desired. Desired condition is for minimum or better ground cover by soil type to keep erosion rates below threshold levels on the allotments.
- **Vegetative Species Composition:** In some specific areas of the allotments monitored with permanent or paced transects, a desired mix of cool and warm season species is lacking. A more even distribution of cool and warm season species in the plant composition is desired within the allotments.
- **Terrestrial and Aquatic Wildlife:** In some specific stream reaches within watersheds bearing federally listed fish species, streambank and riparian vegetation and soil cover conditions are currently at a less than fully satisfactory level.

Management Direction / Forest Plan Consistency

The Apache-Sitgreaves National Forest Land and Resource Management Plan contains several standards, guidelines and goals that pertain to the rangeland resource. Pertinent ones include:

- Provide a program of range management that emphasizes high quality range forage and improvements. Benefits are improved watershed conditions, improved range forage production, improved wildlife habitat and enhanced visual quality (p. 15).
- Continue livestock grazing with increased emphasis on recreation, wildlife and fishery resources, while maintaining basic soil and water values (p.62)
- direction for the rangeland resource is stated: "Provide a program of range management that emphasizes high quality range forage and improvements. Benefits are improved watershed conditions, improved range forage production, improved wildlife habitat, and enhanced visual quality"(pg. 15).
- "Determine grazing capability for livestock in each riparian area. The objectives for each riparian area should include livestock use when consistent with other resource objectives and riparian recovery goals" (pg. 160).
- (Mexican Spotted Owl) Riparian Areas: Emphasize maintenance and restoration of healthy riparian ecosystems through conformance with forest plan riparian standards and guidelines. Management strategies should move degraded riparian vegetation toward good condition as soon as possible. Damage to riparian vegetation, stream banks, and channels should be prevented (pg. 52).
- (Mexican Spotted Owl) Domestic Livestock Grazing: Implement forest plan forage utilization standards and guidelines to maintain owl prey availability, maintain potential for beneficial fire while inhabiting potential destructive fire, maintain and restore riparian ecosystems, and promote development of owl habitat. Strive to attain good to excellent range conditions (pg. 52).
- Continue livestock grazing with increased emphasis on recreation, wildlife, and fishery resources, while maintaining basic soil and water values. The needs of wildlife will be considered when establishing livestock grazing capacity. Cost effective, state-of-the-art management systems and

techniques will be used to integrate other resource objectives with livestock management objectives and improve rangeland condition (pg. 62).

- To improve rangeland condition and resolve conflicts with other resource objectives, improved allotment management plans will be developed using the Integrated Resource Management process. Allotment management plans will implement Forest Plan objectives. Improved allotment management plans will give equal consideration of innovative practices and techniques, structural and non-structural range improvements, non-use agreements, and stocking rate adjustment to achieve integrated resource objectives (pg. 62).
- Full capacity rangeland in unsatisfactory range condition will be treated through continued development of improved allotment management plans as well as structural and non-structural range improvements and pasture stocking rate adjustments (pg. 63).
- Standards: forage use by grazing ungulates will be maintained at or above a condition which assures recovery and continued existence of threatened and endangered species (pg. 64).
- Guidelines: Identify key ungulate forage monitoring areas. These key areas will normally be ¼ to 1 mile from water, located on productive soils on level to intermediate slopes, and be readily accessible for grazing. Size of the key forage monitoring areas could be 20 to 500 acres. In some situations such as high mountain meadows with perennial streams, key areas may be closer than ¼ mile from water and less than 20 acres. Within key forage monitoring areas, select appropriate key species to monitor average allowable use (pg 64).
- **Allowable Use Guide (Percent) By Range Condition And Management Strategy ***

<u>Allowable Use Guide (Percent) By Range Condition And Management Strategy *</u> Range Condition **	Continuou s Season- long Use	Defer 1 yr. in 2	Defer 1 yr. in 3	Defer 2 yr. in 3	Rest 1 yr. in 2	Rest 1 yr. in 2	Rest 2 yr. in 3	Rest over 2 yr. in 3
Very Poor	0	10	5	15	15	10	20	25
Poor	10	20	15	20	20	15	30	35
Fair	20	25	20	30	30	25	40	45
Good	30	35	35	35	35	35	45	50
Excellent	30	35	35	35	35	35	45	50

* Site-specific data may show that the numbers in this table are substantially high or low. These numbers are purposefully conservative to assure protection in the event that site-specific data is not available.

** Range Condition as evaluated and ranked by the Forest Service is a subjective expression of the status of health of the vegetation and soil relative to their combined potential to produce a sound and stable biotic community. Soundness and stability are evaluated relative to a standard characteristic of the soil (pg. 64).

- In consultation with the U.S. Fish and Wildlife Service, develop site-specific forage use levels. In the event that site-specific information is not available, average key species forage utilization in key forage monitoring areas by domestic livestock and wildlife should not exceed levels in the above table during the forage growing season (pg. 65).
- The above table is based on composition and climatic conditions typical of sites below the Mogollon Rim. On Sites with higher precipitation and vegetation similar to sites above the Mogollon Rim, allowable use for ranges in poor to excellent condition under deferment or rest strategies may be increased by 5%. The guidelines established in the above table are applicable

only during the growing season for the identified key species within key areas. Allowable use for key forage species during the dormant season is not covered in the above table. These guidelines are to be applied in the absence of more specific guidelines currently established through site specific NEPA analysis for individual allotments. (pg. 65).

- Guidelines for allowable use for specific allotment(s) management or for grazing strategies not covered in the above table will vary on a site-specific basis when determined through the Integrated Resource Management (IRM) process (pg. 65).
- Allowable use guidelines may be adjusted through the land management planning revision or amendment process. Guidelines established through this process to meet specific ecosystem objectives, will also employ the key species and key area concept and will be monitored in this manner (pg. 65).

The allotments fall within Forest Plan Management Areas 1, 2, 3, 4 and 11. Management emphases for these areas are described below.

- Management Area 1: Forested Land. Emphasize a combination of multiple uses including a sustained yield of timber and firewood production, wildlife habitat, livestock grazing, watershed, and dispersed recreation {Plan p. 119}.
- Management Area 2: Woodland. Emphasize fuelwood production, wildlife habitat, watershed condition, and livestock grazing {Plan p. 145}.
- Management Area 3: Riparian. Recognize the importance and distinctive values of riparian areas. Give preferential consideration to riparian dependent resources. Manage to maintain or improve riparian areas to satisfactory condition {Plan p. 155}.
- Management Area 4: Grasslands. Emphasize wildlife habitat and visual quality, especially big game winter range {Plan p.165}
- Management Area 11: Water. Emphasize the production of fish and wildlife including waterfowl. Manage the areas for dispersed recreation use {Plan p.205}

Decision Framework

The District Ranger of the Springerville Ranger District is the official responsible for selecting an alternative for the management of the Greens Peak, Hall and Cerro Trigo Allotments. Based on the results of this analysis, the Ranger will decide whether or not grazing will be authorized. If an action (grazing) alternative is selected, the District Ranger will decide on a range of permitted number of animals, season of use, class of livestock, the grazing schedule for livestock movements, allowable forage utilization guidelines, permit clauses to bring grazing into compliance with the Forest Plan, and adaptive management measures to improve distribution, use of the range and to mitigate adverse impacts.

Public Involvement

The analysis has been listed in the Schedule of Proposed Actions since at least July 2005. The grazing permittees and the Arizona Game and Fish Department were invited and to some extent have taken part in the early, pre-scoping proposed action development. The proposed action was provided to the public and other agencies for comment during scoping that began in December 2008. Six letters or emails were received from individuals, groups, agencies and the Navajo Nation. The interdisciplinary team and District Ranger met with representatives of all but one of the grazing permittees in February 2009 to review public comments received and discuss permittee comments on the proposed action (documented in meeting notes for 2/5/2009). Out of that meeting some minor modifications were made to the proposed action. In December 2009 the permittees were sent the modified alternative for their comments. None of the permittees sent in

comments. The preliminary EA was sent out for public comment in June 2010, with six comment letters received. Some supplemental analysis and minor editing resulted from the comments. A Decision Notice and Finding of No Significant Impact (DN/FONSI) was signed in September 2010. Appeals were submitted, and the Decision was remanded based on one of the appeal contentions. The environmental analysis was revised and resubmitted for public comment on May 24, 2011

Tribal Consultation

The District Ranger sought input from the Tribes during scoping, with a mailing in December 2008. One response was received, from the White Mountain Apache Tribe, that resulted in additional documentation in the EA. On July 29, 2010 the Forest sent separate consultation letters providing information and seeking involvement and comments to nine Tribes and one Chapter including the White Mountain Apache, San Carlos Apache, Tonto Apache, Yavapai-Apache Nation, Yavapai-Prescott Indian Tribe, Pueblo of Zuni, Hopi Tribe, Navajo Nation, Fort McDowell Indian Community and Ramah Chapter, who all have historic ties and an interest in the Apache-Sitgreaves National Forests. Three responses were received, one a declaration of no concerns. Two Tribes identified a concern that the project not impact shrines. The Tribes were notified of the new opportunity to comment on May 24, 2011.

Issues

Comments received were examined for key issues that are defined as those directly or indirectly caused by implementing the proposed action. 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 or (4) conjectural and not supported by scientific or factual evidence. The Council for Environmental Quality (CEQ) NEPA regulations require the following 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)." Please refer to the project record for a list of all comments received and the interdisciplinary team's response to those comments.

Interdisciplinary team analysis of public comments received during scoping of the proposed action, combined with consultation with permittees during the project development and scoping phases of the environmental analysis resulted in identification of the following key issue:

Economics/Social

Issue: If livestock grazing is discontinued or reduced, there would be adverse economic impacts to grazing permittee families, local communities and Apache County.

This issue will be measured by:

- Grazing Fee Receipts (dollars).
- The number of direct and indirect jobs affected.
- Payments to Counties from grazing receipts (dollars).
- Implications for the local economy.

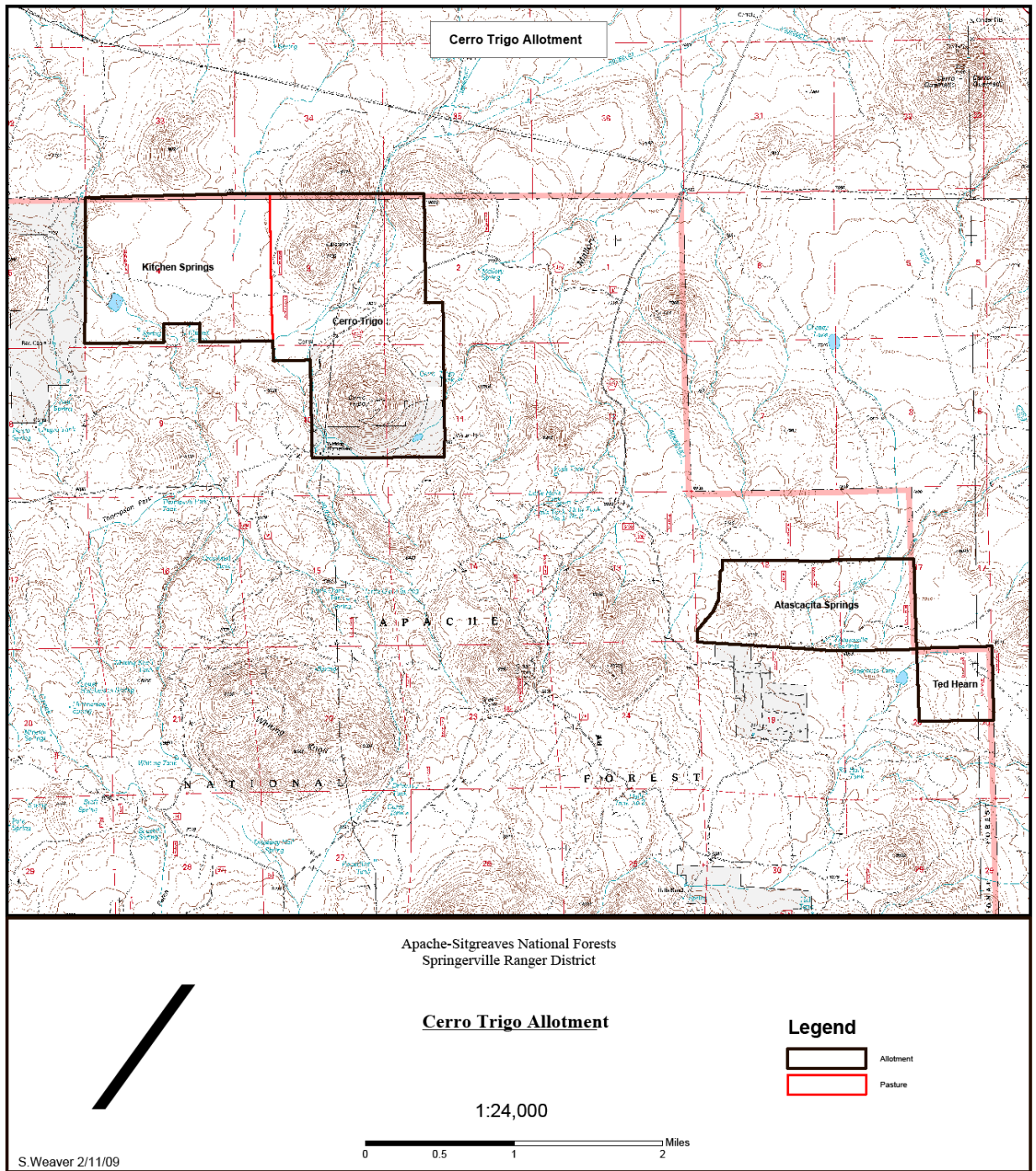


Figure 1: Existing Cerro Trigo Allotment Boundaries

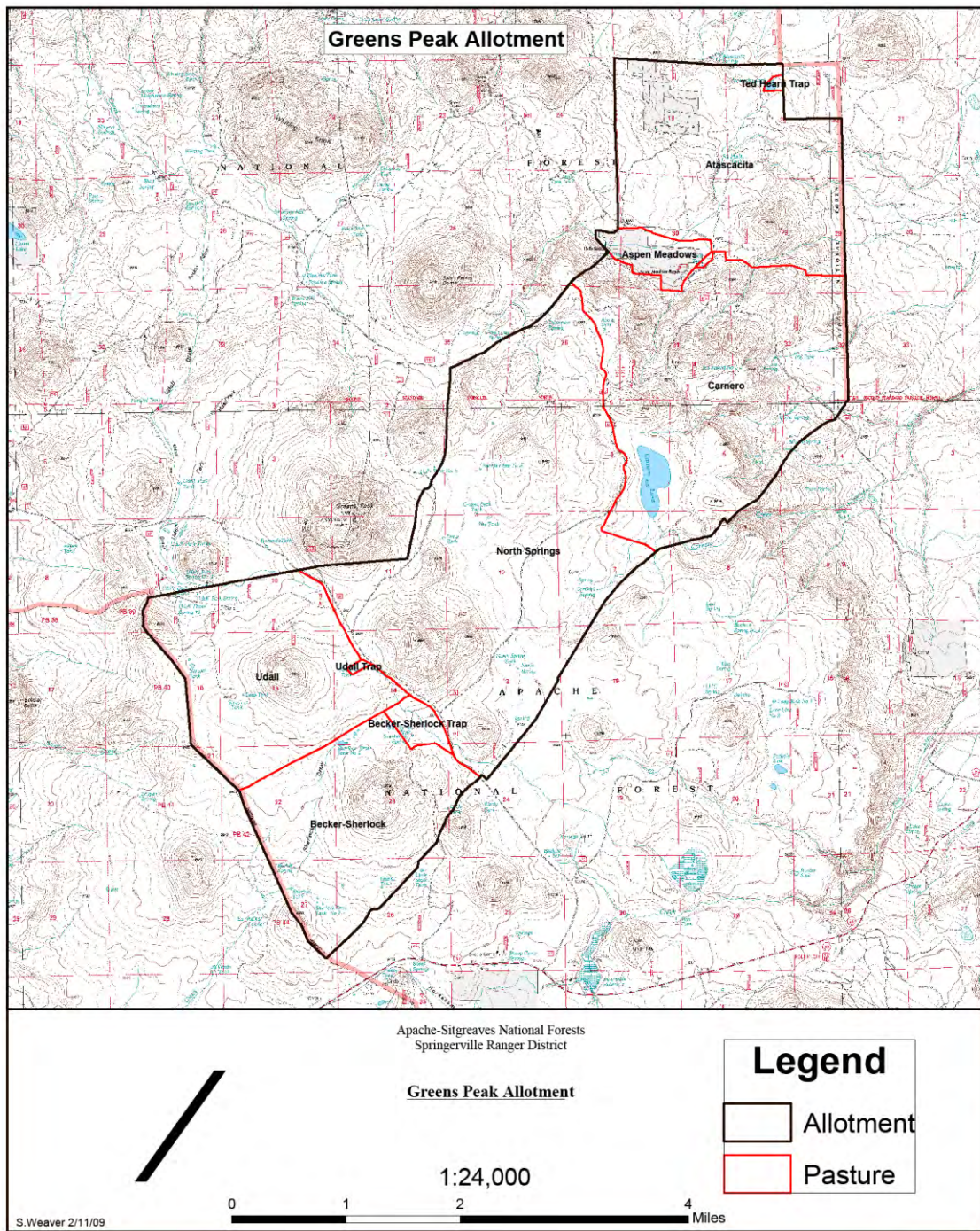


Figure 2: Greens Peak Allotment Boundaries

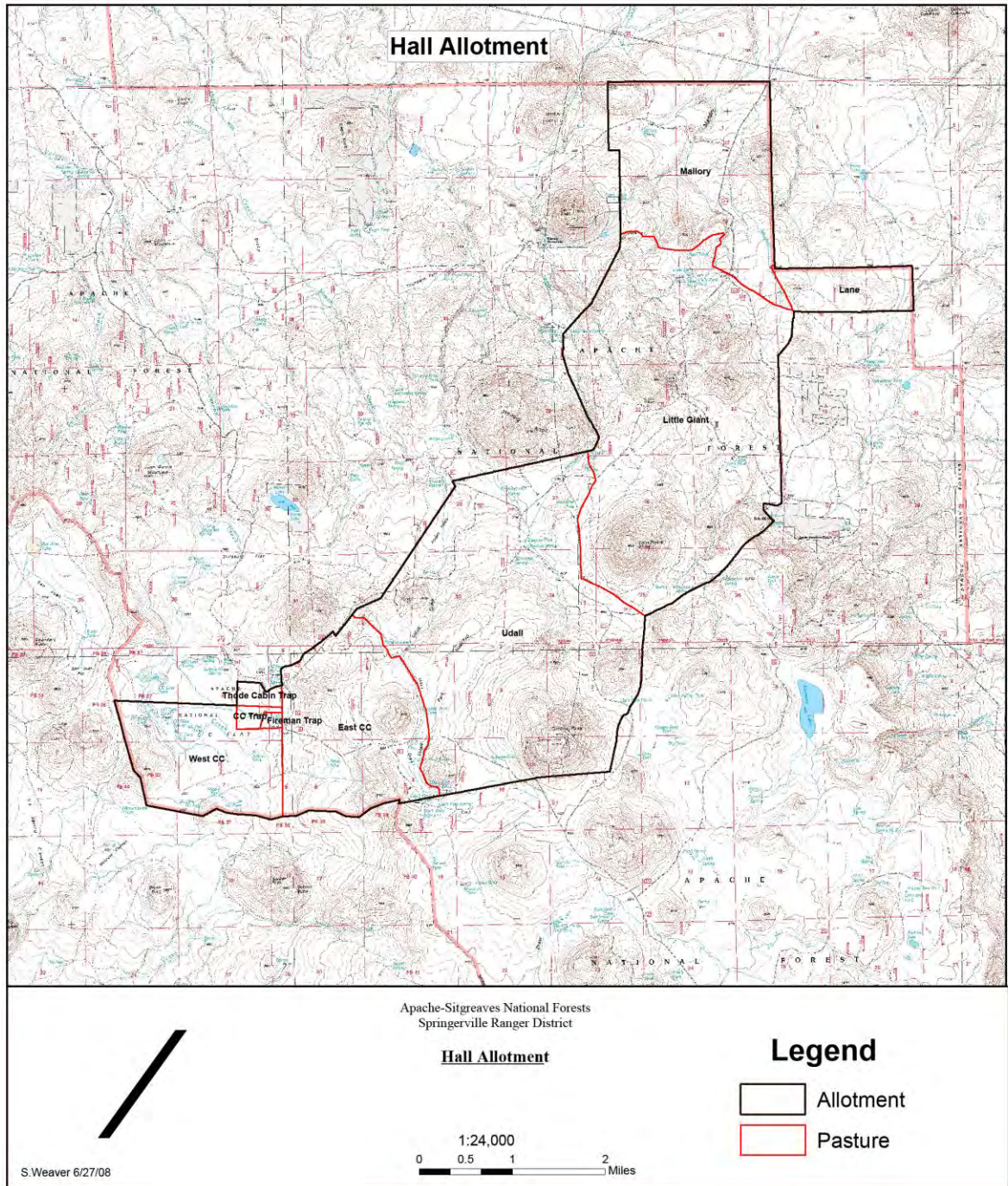


Figure 3: Existing Hall Allotment Boundaries

Chapter 2 – Alternatives

This chapter describes and compares the alternatives considered for the Greens Peak, Hall and Cerro Trigo Allotment Management project. This section presents the alternatives in comparative form, in order to define the differences among alternatives and provide a clear basis for choice among the options for the decision maker and public. The information used to compare the alternatives is based upon the environmental, social, and economic effects of implementing each alternative. The no action alternative of no grazing must be addressed in the analysis as required by the CEQ regulations for implementing NEPA (40 CFR 1502.14). Mitigation and monitoring measures incorporated into the alternatives are also described.

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by the National Environmental Policy Act (NEPA) to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). One alternative was considered, but dismissed from detailed consideration for reasons summarized below.

Current Management

An alternative that continued current management was considered but eliminated because it does not fully meet the Purpose and Need for any of the three allotments. This is because, under current management 1) livestock management actions would not be authorized that would achieve desired conditions for federally listed wildlife and fish species, including setting different allowable forage use levels within Mexican Spotted Owl habitat and improving watershed and riparian conditions in the watershed containing Apache trout; 2) livestock management actions would not be authorized that would speed achievement of desired conditions for vegetation composition in upland and riparian areas, and 3) livestock management actions would not be authorized that would speed achievement of desired conditions for soil cover in upland and riparian areas.

Alternatives

Alternative 1 – No Action

This alternative would not allow permitted livestock grazing on the three allotments during a ten-year period from the date a decision is made. No new grazing permits would be issued. Existing allotment boundary fences would not be removed. Remaining allotment boundary fence maintenance responsibilities from the three allotments would be re-distributed to adjacent allotment permittees. Interior fences and other structural range developments may be removed for wildlife benefit. Upland water developments may be maintained on an opportunity basis.

Alternative 2 – Modified Proposed Action

The following alternative has been developed to meet the project's purpose and need. There are four components: authorization, adaptive management, resource protection measures and monitoring. It follows current guidance from Forest Service Handbook 2209.13, Chapter 90 (Grazing Permit Administration; Rangeland Management Decision-making) and the ASNFs Land and Resource Management Plan. It also maintains or moves conditions toward resource goals as addressed in other pertinent laws and regulations, such as the Endangered Species Act and the

Clean Water Act. (Figures 4 and 5 display the adjusted boundaries of Hall and Cerro Trigo allotments included in this alternative.)

Minor Modifications to the Proposed Action since 2008 Scoping

In February 2009, the Springerville District Ranger and the Interdisciplinary Team met with four of the involved grazing permittees to discuss the proposed action and issues received from public scoping. During that meeting, agreement was reached on several minor changes to the proposed action.

Several range improvements were added for adaptive management analysis. The range of authorized animal unit months for all three allotments was changed to show a minimum of zero AUMs, to allow for future non-use. Hall and Greens Peak were changed to show slightly increased maximum AUMs, and what conditions would be needed for such levels to be authorized. The season for the Hall pastures was set from June 1 through October 15. Pastures would not be re-grazed without adequate re-growth, and most pastures grazed only once per season. Adjusting the movement of livestock between pastures to accommodate wolf management was added.

Adaptive Management

Adaptive management options for the three allotments provide a choice of actions that may be needed to adjust management to meet desired conditions. If monitoring indicates desired conditions are not being achieved, management would be modified and implemented through the Annual Operating Instructions (AOI). Adaptive management allows the Forest Service to adjust: the timing, intensity, frequency and duration of grazing; the grazing management system and livestock numbers.

Adaptive management would also allow for other identified actions (such as additional herding, fencing, development of upland waters, etc.) if they are determined, through monitoring, to be necessary for to achieve desired conditions. If the need for construction of an adaptive management range improvement occurs more than two years from the decision date, a separate cultural resources survey of the improvement site would be conducted. Improvements to be constructed within two years have been surveyed as part of this analysis.

Annual authorized livestock numbers (AUMs) would be based on existing conditions, available water and forage production on the allotments, and improvement of the unsatisfactory riparian conditions which occur on portions of the allotments.

Authorization

Seasonal livestock grazing would continue by reissuing ten year term grazing permits including the following terms and conditions:

Greens Peak Allotment Authorization

1. Permitted livestock numbers would vary between 0 and 2,433 Animal Unit Months (AUMs) annually, with the knowledge that the highest number of AUMS would rarely be authorized. The maximum number of 2,433 AUMs would be supported during times of favorable climatic conditions having abundant vegetative growth, and with conditions at the identified areas of concern (Udall Draw Spring and Sherlock Draw areas, and stream courses or wetlands currently in less than Proper Functioning Condition) having substantially met Proper Functioning Condition (PFC). Annual authorized livestock AUMs would be based on existing conditions including available water and forage production on the allotments. Adjustments to the annual authorized livestock numbers may occur during the grazing year, upward based on favorable

conditions or downward if conditions are not favorable, such as in the case of drought, insects or other environmental factors.

2. The grazing period within the allotment would be based upon weather/climate conditions, current growing conditions, the need to provide for plant re-growth following grazing, and any other resource conditions requiring consideration. The length of the grazing period within each pasture would consider and manage for the desired conditions. The on-date would be when range readiness¹ has been met, which is typically June 1 – June 15 for the spring and summer grazing. The off date would generally occur on or prior to October 31. The livestock of all five permittees will be run as one herd through the allotment.

3. Grazing would generally occur through a deferred grazing system which allows for plant growth and recovery. Other systems may be employed to facilitate specific resource objectives. Pasture rotations will be planned at the beginning of each grazing year and would be continually modified through adaptive management in response to changing resource conditions, to accommodate Mexican Grey wolf management or for other reasons.

4. A management guideline of conservative use of 30 - 40% by weight maximum utilization of one to two key forage species in the uplands as measured at the end of the growing season would be employed to improve vegetative and soil conditions.

5. Riparian areas are critical areas on the Greens Peak allotment. In order to provide riparian vegetation of adequate height and cover to protect soil surfaces and dissipate energy during overland flows, maintain 6 inches stubble height of herbaceous vegetation at the green line of streamside perennial vegetation, at and below Carnero Springs which is in satisfactory/ PFC. In other riparian areas, maintain 6 inches of stubble height along streams and in hydrophilic vegetation in wetlands in satisfactory condition, and 8 inches if less than satisfactory/PFC, at the end of the growing season. Satisfactory condition is defined as PFC while unsatisfactory conditions are defined as Non-Functioning or Functioning-At-Risk, in PFC terminology.

6. Within Northern goshawk habitat, maintain maximum forage utilization between 20% – 40% by weight at the end of the grazing season.

7. Promote and maintain good to excellent range conditions over time and across communities used by the Mexican spotted owl in Protected Activity Center areas.

8. In general pastures would be grazed only once during the grazing year. However, if the need arises to provide rest or deferment for other pastures, a pasture may be used twice provided there has been sufficient vegetative re-growth and grazing is managed to meet the desired conditions specified above.

Greens Peak Adaptive Management Actions

The following adaptive management actions are authorized to be implemented if monitoring indicates that the authorized management described above for the Greens Peak Allotment is not meeting desired conditions, or to address localized resource issues. Implementation of these actions, if determined needed, except for item 1, would be funded by varying percentages of monies by the permittees, Forest Service, and grant funds, if funds are available.

-- If desired vegetative conditions are not met in riparian/critical areas, the permittees will use a herder to move livestock out of riparian/critical areas.

¹ Range readiness is the period in spring when the soil is dry enough to be firm, and plant growth is advanced enough to avoid long-lasting damage to preferred cool-season species. Common indicators of readiness are cool-season grasses headed out, forbs in bloom and aspen leafed out. (R3 Rangeland Analysis and Management Training Guide, page 4-4)

- If riparian vegetation height and cover is not sufficient to protect soil surfaces and dissipate energy during overland flows within the riparian areas: Construct a fence to protect the Carnero Springs and riparian area within North Spring Pasture and to provide greater control of livestock use within critical riparian areas.
- Construct a livestock enclosure at Sherlock Draw to protect the wetland just upstream of the stock tank.
- Clean out the ditch located near Halls Tank and Ted Hearn's Trap.
- Improve livestock distribution by developing watering sources in uplands. Possible methods would be adding to functional pipelines, constructing trick tanks, or constructing roadside pit tanks.
- Reconstruct Reservation/Forest Boundary fences, those not already reconstructed.
- Install protective fencing around active springs, making the water available via troughs outside the fences on an opportunity basis.
- Replace the trough at Patterson Springs above Hall Ranch, extend the pipeline from the existing Patterson springs pipeline into Atascacita Pasture, and set up a trough there.

Hall Allotment Authorization:

1. The Hall Allotment would be divided between the two grazing permittees, based on the existing proportional split of the allotment's capacity. West CC, East CC and Udall pastures would be assigned to one permittee. Little Giant, Mallory and Lane pastures would be combined with Cerro Trigo Allotment. (See the maps which display the adjusted boundaries of Hall and Cerro Trigo allotments, included at the end of this chapter.)

2. Permitted livestock numbers would vary between 0 to 1,468 AUMs on the remaining three pastures of Hall Allotment. The reduction partly reflects the shift of pastures to Cerro Trigo allotment, and partly reflects the current capacity estimate for the remaining pastures. Annual authorized livestock AUMs will be based on existing conditions, available water and forage production on the allotments. Adjustments to the annual authorized livestock numbers may occur during the grazing year, upward based on favorable conditions or downward if conditions are not favorable, such as in the case of drought, insects or other environmental factors.

A maximum of 1,362 AUMs would be supported in years of favorable climatic and forage conditions, and with Adaptive Management Action "A" actions implemented.

The 1,468 AUMs would be supported if:

- monitoring determines that there is sufficient forage available for resource protection and additional livestock numbers;
- enough improvements (Adaptive Management Action B) are in place and are resulting in improved livestock distribution and forage utilization patterns;
- desired conditions are being substantially met in areas of concern (Potato Patch, Vernon Creek, the riparian zone in the northern part of West CC pasture);
- stream courses or wetlands currently in less than PFC have substantially met PFC.

3. The grazing period within the allotment would be based upon weather/climate conditions, current growing conditions, the need to provide for plant re-growth following grazing, and any other resource conditions requiring consideration. The length of the grazing period within each pasture would consider and manage for the desired conditions. The on-date would be when range

readiness has been met, which is typically June 1 – June 15 for the spring and summer grazing. The off date would generally occur on or prior to October 15.

4. Adjustments to the annual authorized livestock numbers may occur during the grazing year, based on favorable conditions or may be adjusted downward if conditions are not favorable, such as in the case of drought, insects or other environmental factors.
5. Install one or two temporary enclosure cages, each enclosing approximately 1000 square feet at Potato Patch, along or across the greenline, to confirm stubble height potential.
6. Riparian areas are critical areas on the Hall allotment. In order to provide riparian vegetation of adequate height and cover to protect soil surfaces and dissipate energy during overland flows, where the potential exists, maintain stubble heights of herbaceous vegetation at the green line of streamside perennial vegetation (6 inches along streams and in hydrophilic vegetation in wetlands in satisfactory/PFC condition; 8 inches if less than satisfactory, at the end of the growing season), at Potato Patch and Vernon Creek. All other areas of unsatisfactory riparian (wetlands and stream courses) will be maintained at 8 inches stubble height until back in satisfactory condition. Satisfactory condition is defined as PFC while unsatisfactory conditions are defined as Non-Functioning or Functioning-At-Risk, in PFC terminology.
7. A management guideline of conservative use of 30 - 40% by weight maximum utilization of one to two key forage species in the uplands as measured at the end of the grazing season would be employed to improve vegetative and soil conditions.
8. Grazing would generally occur through a deferred system which allows for plant growth and recovery. Other systems may be employed to facilitate specific resource objectives. Pasture rotations will be planned at the beginning of each grazing year and would be continually modified through adaptive management in response to changing resource conditions, to accommodate Mexican Grey wolf management or for other reasons.
9. On the Hall allotment, in general pastures would be grazed only once during the grazing year. However, if the need arises to provide rest or deferment for other pastures, a pasture may be used twice provided there has been sufficient vegetative re-growth and grazing is managed to meet the desired conditions specified above.
10. Within Northern goshawk habitat, maintain maximum forage utilization between 20% – 40% by weight at the end of the grazing season.
11. Promote and maintain good to excellent range conditions over time and across communities used by the Mexican spotted owl in Protected Activity Center areas.

Hall Allotment Adaptive Management Actions

The following adaptive management actions are authorized to be implemented if monitoring indicates that the authorized management described above for the Hall Allotment is not meeting desired conditions, or to address localized resource issues. Implementation of these actions, if determined needed, except for item 1, will be funded by varying percentages of monies by the permittees, Forest Service, and grant funds, if funds are available.

Hall Management Action A:

- If desired vegetative conditions are not met in riparian areas, the permittees will use a herder to move livestock out of critical areas.
- If riparian vegetation height and cover is not sufficient to protect soil surfaces and dissipate energy during overland flows within a critical area such as Potato Patch: Construct a fence around the area to provide greater control of livestock use within the critical area, which are the unforested open areas.

Hall Management Action B:

- Improve livestock distribution by developing watering sources in uplands. Possible methods would be adding to functional pipelines, constructing trick tanks, or constructing roadside pit tanks.
- Reconstruct Forest Boundary fences, where not already reconstructed.
- Install protective fencing around active springs, making the water available via troughs outside the fences on an opportunity basis.
- Udall Draw Spring – Reconstruct spring and storage facilities, install approximately 1.5 miles of pipeline and setup new troughs and float boxes. This would improve livestock distribution in Udall and East CC Pastures of Hall Allotment. If getting enough water from the spring seems unfeasible, convert the large metal storage tank to a roofed trick tank.
- Burnt Mill Spring – Reconstruct and upgrade spring, replace/repair storage facilities and troughs, replace existing approximately 1.5 miles of Homestead Pipeline from Burnt Springs to the Little Giant Pasture of the Cerro Trigo Allotment. As planning of grazing strategies are developed and implemented, additional storage facilities and watering points (located strategically to benefit prescribed grazing plans while considering fences and topography, and surveyed for cultural resources while being designed) would be constructed. The goal is to provide optimum trough spacing and capacity to adequately supply water to livestock and wildlife at each watering points.
- Clean out Hidden Tank using heavy equipment.
- Construct approximately one mile of new spur pipeline in Sections 3 and 4.

Cerro Trigo Allotment Authorization

1. Permitted livestock numbers would vary between 0 to 969 AUMs on the expanded Cerro Trigo allotment. The AUMs include up to 723 coming from the three Hall pastures being newly incorporated into Cerro Trigo as well as up to 246 from the existing allotment. (See the maps which display the adjusted boundaries of Hall and Cerro Trigo allotments, included at the end of this chapter.)

Annual authorized livestock numbers would be based on existing conditions, available water and forage, and predicted forage production for the year. Adjustments to the annual authorized livestock numbers may occur during the grazing year, based on favorable conditions or may be adjusted downward if conditions are not favorable, such as in the case of drought, insects or other environmental factors.

A maximum of 875 AUMs would be supported in years of favorable climatic and forage conditions, and with Adaptive Management Action “A” actions implemented.

The 969 AUMs would be supported if:

- monitoring determines that there is sufficient forage available for resource protection and additional livestock numbers;
- enough improvements (Adaptive Management Action B) are in place and are resulting in improved livestock distribution and forage utilization patterns;
- desired conditions are being substantially met in areas of concern (Kitchen Spring, Atascacita Spring);
- stream courses or wetlands currently in less than PFC have substantially met PFC.

2. The grazing period within the Cerro Trigo allotment would be based upon weather/climate conditions, current growing conditions, the need to provide for plant re-growth following grazing, and any other resource conditions requiring consideration. The length of the grazing period within each pasture would consider and manage for the desired conditions. The on-date would be when range readiness has been met, which is typically June 1 – June 15 for the spring and summer grazing. The off date would generally occur on or prior to October 31.
3. Annual authorized livestock numbers would be based on range readiness, existing conditions, available water and forage, and predicted forage production for the year. Adjustments to the annual authorized livestock numbers may occur during the grazing year, based on favorable conditions or may be adjusted downward if conditions are not favorable, such as in the case of drought, insects or other environmental factors.
4. Grazing would occur through a deferred system which allows for plant growth and recovery. Other systems may be employed to facilitate specific resource objectives. Pasture rotations will be planned at the beginning of each grazing year and would be continually modified through adaptive management in response to changing resource conditions, to accommodate Mexican Grey wolf management or for other reasons.
5. A management guideline of conservative use of 30 - 40% maximum utilization in one to two key species in the uplands as measured at the end of the grazing season would be employed to improve vegetative and soil conditions.
6. Riparian areas are critical areas on the Cerro Trigo allotment. In order to provide riparian vegetation of adequate height and cover to protect soil surfaces and dissipate energy during overland flows, maintain 6 inches of stubble height along streams and in hydrophilic vegetation in wetlands in satisfactory condition (West Kitchen Spring, Upper Kitchen Spring), and 8 inches if less than satisfactory/PFC, at the end of the growing season. Satisfactory condition is defined as PFC while unsatisfactory conditions are defined as Non-Functioning or Functioning-At-Risk, in PFC terminology.
7. In general pastures would be grazed only once during the grazing year. However, if the need arises to provide rest or deferment for other pastures, a pasture may be used twice provided there has been sufficient vegetative re-growth and grazing is managed to meet the desired conditions specified above.
8. Maintain existing spring developments and expand the existing exclosure upstream of Kitchen Springs to protect the spring itself.

Cerro Trigo Allotment Adaptive Management Actions

The following adaptive management actions are authorized to be implemented if monitoring indicates that authorized management described above for the Cerro Trigo Allotment is not meeting desired conditions. The adaptive management options below may also be implemented if it is determined that their implementation would accelerate achievement of desired conditions. Implementation of these actions, if determined needed, except for item 1, would be funded by varying percentages of monies by the permittees, Forest Service, and grant funds, if funds are available.

Cerro Trigo Management Action A:

-- If desired vegetative conditions are not met in riparian areas, the permittee will use a herder or fencing to keep livestock out of critical areas.

Cerro Trigo Management Action B:

-- Reconstruct Forest Boundary fences, those not already reconstructed.

- Install protective fencing around active springs, making the water available via troughs outside the fences on an opportunity basis.
- Improve livestock distribution by developing / reconstructing watering sources in uplands.
- Replace or repair approximately 0.5 miles of Burnt Mill Pipeline from right fork to the storage tanks, east and then north to Mallory Pasture north boundary. Replace old troughs and floatboxes. This pipeline is an extension from Burnt Mill Spring.
- Construct approximately 1.5 miles of new pipeline and setup a trough in Section 11 of Mallory Pasture. This pipeline will be extended from Homestead Pipeline, running along south and north of Whiting Homestead. As planning of grazing strategies are developed and implemented, additional storage facilities and watering points will be constructed. The goal is to provide optimum trough spacing and capacity to adequately supply water to livestock and wildlife at each watering points.
- Construct approximately 0.5 miles of new pipeline and setup troughs in the west end of Atascacita Springs Pasture. The pipeline will be extended from the existing Burnt Mill Pipeline.
- Construct approximately 0.75 miles of new pipeline and setup a trough in the west end of Mallory Pasture. The pipeline will be extended from existing Homestead Pipeline.
- Construct approximately 1.5 mile of new pipeline and setup a trough in the north end of Kitchen Springs. The pipeline will be extended from the existing Homestead Pipeline. The main pipeline would continue onto this private land to the north.
- Replace the old trough located near the Substation.
- Construct an approximately 60 acre Horse Trap near private land on west end of former Boy Scout camp, to keep authorized ranch horses on and off the allotment, for working cattle on the allotments.
- Repair pipeline, fence and troughs at Mallory Springs.

Monitoring

Two types of monitoring would be used on the three allotments, implementation and effectiveness monitoring. Implementation monitoring is generally conducted on an annual basis, to answer the question “Was management implemented as designed?”

Effectiveness monitoring, to evaluate the success of management in achieving the desired objectives, will occur periodically within key and critical areas.

The monitoring methods used would be both qualitative and quantitative and would include the Interagency Technical References, Region 3 Rangeland Analysis and Management Training Guide, the Region 3 Allotment Analysis Handbook and other agency-approved methods. See Appendix A – Monitoring Plan of the Environmental Assessment for details.

Resource Protection Measures

The preferred alternative is designed to comply with Forest Plan standards and guidelines, as amended. Authorization and adaptive management options are incorporated into the project to

protect forest resources of soil, water, wildlife, riparian and aquatic habitat. Best management practices have been incorporated in the authorization and adaptive management options.

Comparison of Alternatives

Table 2: Comparison between the alternatives.

Comparable Aspect	Cerro Trigo Allotment	Greens Peak Allotment	Hall Allotment
Alternative 1: No-Action/ No Grazing			
Stocking	0 AUMs year 1-10	0 AUMs year 1-10	0 AUMs year 1-10
Duration	10 years or more	10 years or more	10 years or more
Fencing	Boundary fencing remains, interior fencing may be removed	Boundary fencing remains, interior fencing may be removed	Boundary fencing remains, interior fencing may be removed
Waters	Maintained on opportunity basis	Maintained on opportunity basis	Maintained on opportunity basis
Allowable Ungulate Herbivory in Uplands	30-40% end of season	30-40% end of season	30-40% end of season
Regrazing	No control over wildlife use	No control over wildlife use	No control over wildlife use
Vegetative Condition Goal	Herbaceous vegetative composition is moving toward a high similarity to the Potential Natural Community to the extent existing tree canopy cover permits.	Herbaceous vegetative composition is moving toward a high similarity to the Potential Natural Community to the extent existing tree canopy cover permits.	Herbaceous vegetative composition is moving toward a high similarity to the Potential Natural Community to the extent existing tree canopy cover permits.
Goshawk habitat goal	n/a	Up to 20-40% forage use end of growing season	Up to 20-40% forage use end of growing season
Spotted owl Range Condition Goal	n/a	Good to Excellent condition in habitat	Good to Excellent condition in habitat
Riparian –Stream Protection Goal	8 inches stubble end of season all areas wetlands / stream courses until PFC attained; 6" at PFC	8 inches stubble end of season at/near Carnero Springs and Creek plus all unsat areas; 6" at PFC	8 inch stubble height end of season in Potato Patch and near Vernon Creek plus all unsat areas; 6" at PFC
Effects mitigation	None needed.	None needed.	None needed.

Alternative 2: Proposed Action			
Stocking	0 - 969 AUMs	0 - 2433 AUMs	0 - 1468 AUMs
Duration	10 years or more	10 years or more	10 years or more
Fencing	Current boundary and interior fencing remains, some new fences possible	Current boundary and interior fencing remains, some new fences possible	Current boundary and interior fencing remains, some new fences possible
Waters	Maintained by permittees, some may be cooperatively reconstructed.	Maintained by permittees, some may be cooperatively reconstructed.	Maintained by permittees, some may be cooperatively reconstructed.
Livestock On-Dates	June 1 - Oct 31	June 1 - Oct 31	June 1 - Oct 15
Grazing system	Deferred rotation	Deferred rotation	Deferred rotation
Allowable Ungulate Herbivory in Uplands	30-40% end of season	30-40% end of season	30-40% end of season
Regrazing	Conditional allowance for livestock; no control over wildlife use	Conditional allowance for livestock; no control over wildlife use	Conditional allowance for livestock; no control over wildlife use
Vegetative Condition Goal	Herbaceous vegetative composition is moving toward a high similarity to the Potential Natural Community to the extent existing tree canopy cover permits.	Herbaceous vegetative composition is moving toward a high similarity to the Potential Natural Community to the extent existing tree canopy cover permits.	Herbaceous vegetative composition is moving toward a high similarity to the Potential Natural Community to the extent existing tree canopy cover permits.
Goshawk habitat goal	n/a	Up to 20-40% forage use end of growing season	Up to 20-40% forage use end of growing season
Spotted owl Range Condition Goal	n/a	Good to Excellent condition in habitat	Good to Excellent condition in habitat
Riparian –Stream Protection Goal	8 inches stubble end of season all areas wetlands / streamcourses until PFC attained, 6" at PFC	8 inches stubble end of season at/near Carnero Springs and Creek plus all unsat areas, 6" at PFC	8 inch stubble height end of season in Potato Patch and near Vernon Creek plus all unsat areas, 6" at PFC

Effects Mitigation	Adaptive Management:	Adaptive Management:	Adaptive Management:
	Reconstruct Forest/ Reservation boundary fencing	Reconstruct Forest/ Reservation boundary fencing	Reconstruct Forest/ Reservation boundary fencing
	herding in riparian areas if needed	herding in riparian areas if needed	herding in riparian areas if needed
	develop upland water sources	develop upland water sources	develop upland water sources
	fencing around springs	fencing around springs	fencing around springs
		fencing near Carnero	fencing near Potato Patch
	Substation trough	Patterson Springs trough	Udall Draw Spring work
	Burnt Mill pipeline work, troughs		Burnt Mill Spring work
	Mallory Pasture pipeline work, troughs		
	Atascacita Springs Pasture troughs		
	Kitchen Springs area trough from Homestead Pipeline		
	Note watershed problems during routine inspections	Note watershed problems during routine inspections	Note watershed problems during routine inspections
	Expand Kitchen Springs Exclosure	Exclosure at Sherlock Draw wetland	1 or 2: 1000 sq ft cages Potato Patch for stubble height potential

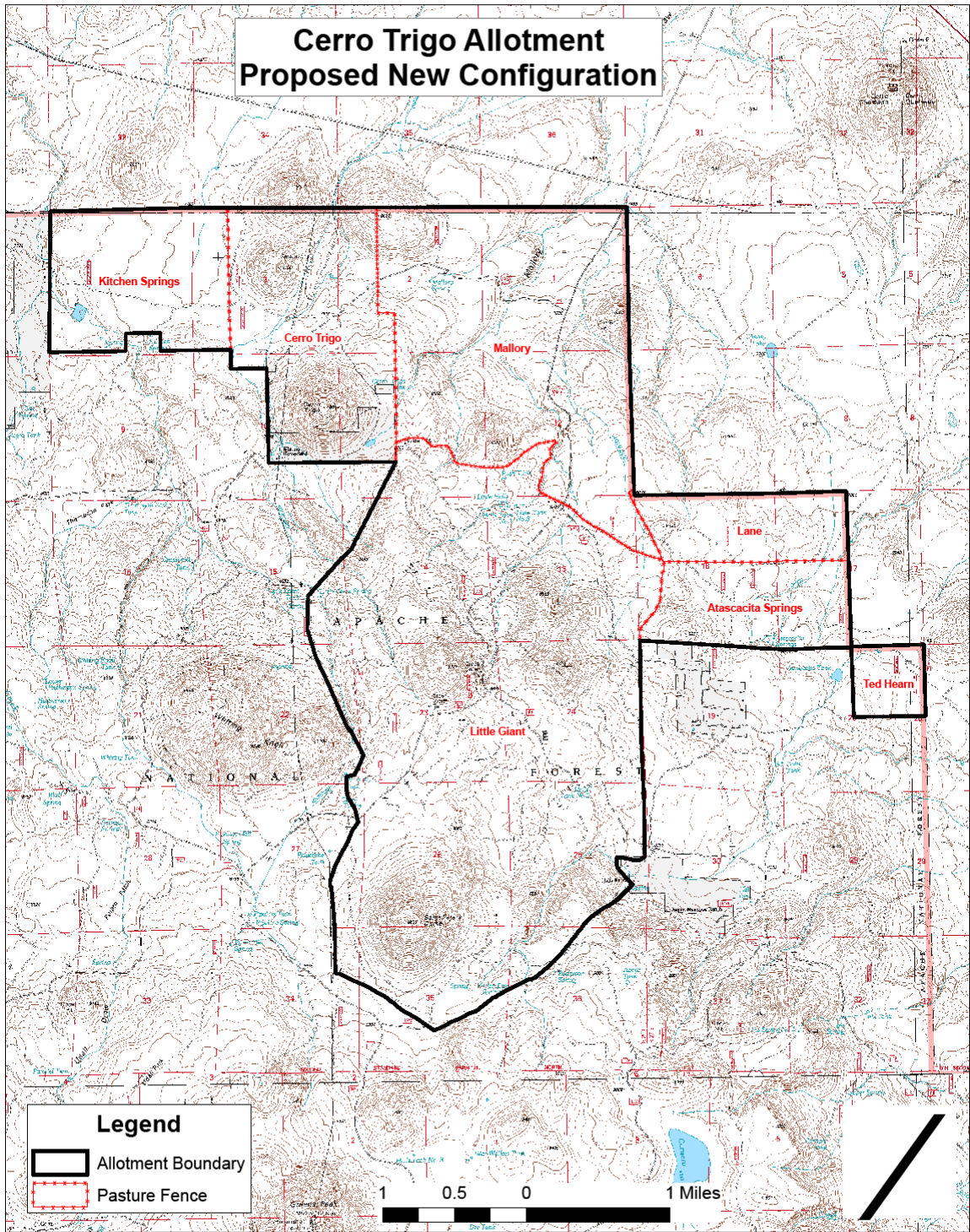


Figure 4: Proposed Cerro Trigo Allotment Boundaries

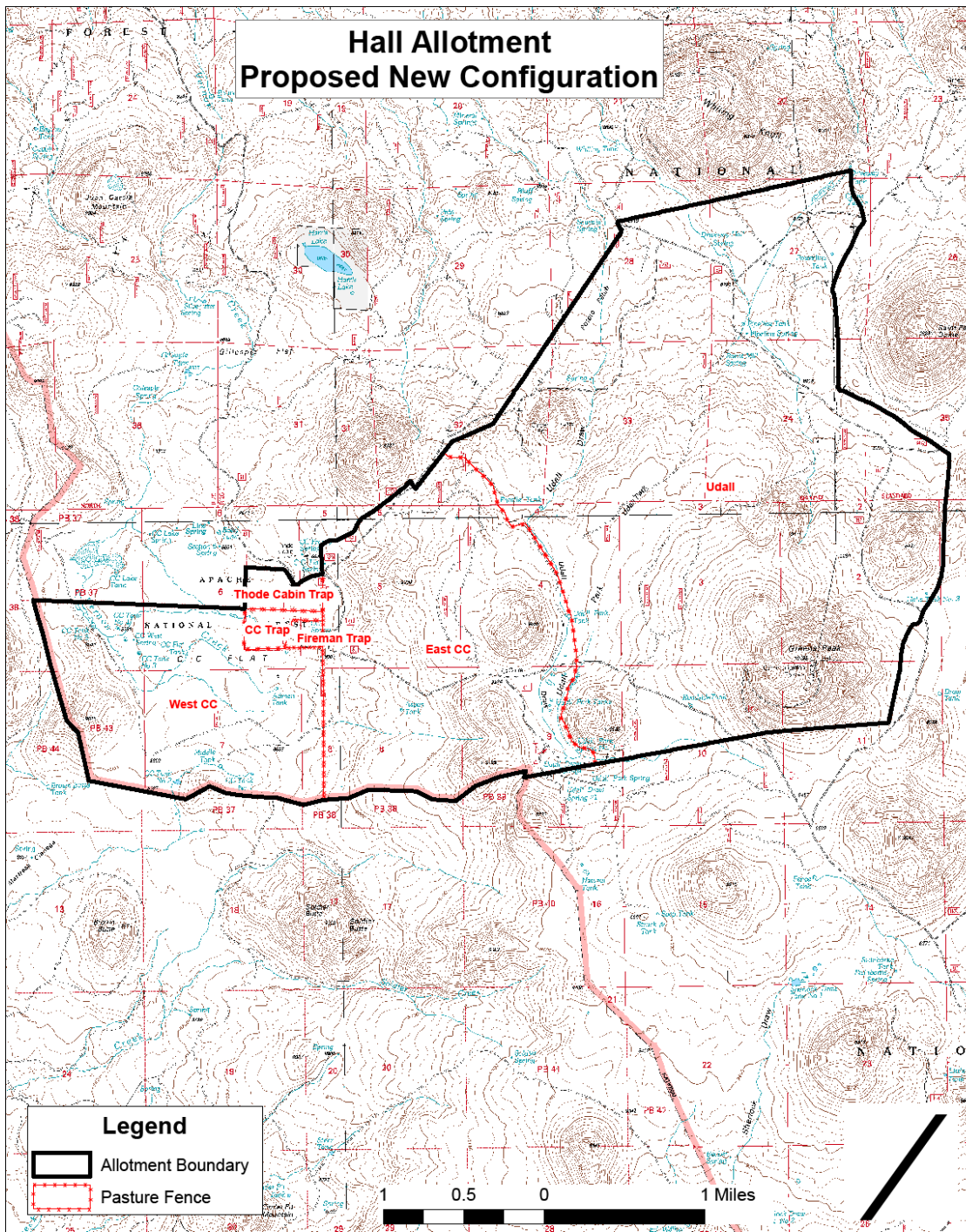


Figure 5: Proposed Hall Allotment Boundaries

Chapter 3 - Environmental Consequences

The current conditions as expressed in the affected environment section reflect the effects of all past and present management activities across the landscape. The effects upon various resources, such as plants, soils, wildlife, etc., that are anticipated as consequences of implementing each alternative are discussed in the sections below. At the same time, these resources will be and have been impacted by other factors. These are called “cumulative effects” and they encompass past, present and foreseeable future actions. Cumulative effects are discussed at the end of each of the following resource sections. The project record contains specialist reports for most of the resources analyzed.

We recognize that other unforeseeable cumulative factors can impact the ability of the ecosystem to reach desired conditions. While, for example, severe or long term drought and catastrophic wildfire can and will likely occur over ecological time, there is no way to predict their intensity and extent so no estimation of effects is made.

The interdisciplinary team and District Ranger determined that no direct or indirect or cumulative effects would occur to recreation, fuels management, or timber management from either alternative, so those resources were not analyzed in detail.

Cumulative Effects

Table 3: Past, Present and Foreseeable Future Cumulative Activities

Note: Past activities are included in the background and affected environment discussions.

Allotment Name	Past Effects	Affected Area for Past Effects
Cerro Trigo	livestock grazing	whole watershed has been grazed for at least a century, wet areas show impacts from historic use, some of the high use areas used to be private land and are still in poor condition
	wildlife / elk grazing	whole watershed has been grazed by Merriam’s elk (extirpated), Roosevelt elk since the 1920’s, antelope and other misc. smaller wildlife
	road maintenance	grading of system roads all across these allotments, plus un-maintained road impacts
	road closures	Skid trails and a few 2-tracks were closed, little effect left
	wildfires / prescribed fires	Very little burning, perhaps some limited pile burning
	commercial logging	None
	thinning	None
	fuel-wooding	scattered with little overall effects
	recreation	scattered across whole watershed, little effects

	OHV use	whole watershed, little effects in past, limited use in past decades
Greens Peak	livestock grazing	whole watershed has been grazed by livestock for at least a century, likely higher amount of use in past
	wildlife / elk grazing	whole watershed has been grazed by Merriam's elk (extirpated), Roosevelt elk since the 1920's, antelope and other misc. smaller wildlife, elk numbers used to be insignificant
	road maintenance	regular maintenance of major roads, no maintenance of 2-track roads
	road closures	Few closures in past
	wild fires / prescribed fires	Few wildfires in past, none of significance; some prescribed fires
	commercial logging	Some logging in past, now healed over
	thinning	Some thinning in past, now healed over
	fuel-wooding	very limited, no commercial sales
	recreation	some elk hunting, popular camping areas on allotment
	OHV use	limited in past decades
Hall	livestock grazing	whole watershed is grazed by livestock for at least a century, likely higher amount of use in past,
	wildlife / elk grazing	whole watershed has been grazed by Merriam's elk (extirpated), Roosevelt elk since the 1920's, antelope and other misc. smaller wildlife, elk numbers used to be insignificant
	road maintenance	only along system roads
	road closures	Few on allotment
	wild fires / prescribed fires	Few wildfires, none severe; limited prescribed fire in past, now healed and stable
	commercial logging	Very limited logging in past
	thinning	Limited thinning in past
	Fuel-wooding	scattered across watershed, limited to local use, no commercial sales
	recreation	scattered across limited accessible areas in past: hunting and recreational camping
	OHV use	limited in past decades

Allotment Name	Current Effects	Affected Area for Current Effects
Cerro Trigo	livestock grazing	whole watershed currently grazed, minus a few small exclosures
	wildlife / elk grazing	whole watershed currently grazed by increasing numbers of elk

	road maintenance	grading of system roads, little effect
	road closures	Few road closures outside of a few 2-tracks, little effect left
	wildfires / prescribed fires	limited pile burns
	commercial logging	No commercial logging on Cerro Trigo, most non-forested
	thinning	Very little commercial activity on Cerro Trigo, most non-forested
	fuel-wooding	Likely some scattered fuel wooding, little overall effects,
	recreation	Very little recreational activity as allotment is not a high use area, little effects from recreation, some hunting use in fall
	OHV use	whole watershed, increasing effects from off-road travel (across meadows) however allotment is not a high use area for OHV use
Greens Peak	livestock grazing	whole watershed currently being grazed outside forested areas that do not have much forage base
	wildlife / elk grazing	whole watershed is being grazed, most grazing use in non-forested areas
	road maintenance	Few major roads that get maintained, once a year.
	road closures	Few, some old skid trails and logging roads, now healed over.
	wild fires / prescribed fires	Nothing major, few lightning strikes, no major forest fires
	commercial logging	none yet, new Stewardship Contract areas planned in watershed
	thinning	none yet, new Stewardship Contract areas planned in watershed
	Fuel-wooding	very limited, no commercial sales
	recreation	limited, some elk hunting
	OHV use	limited but increasing trends, use is increasing in popular camping areas
Hall	livestock grazing	whole watershed is grazed outside forested areas that do not have much forage base under dense overstory
	wildlife / elk grazing	elk grazing in watershed, other wildlife little effects
	road maintenance	only along county maintained & system roads, some contribution of sediment but most road mileage is well drained and sediment cannot reach drainages.
	road closures	Few road closures outside of old logging roads and skid trails
	wild fires / prescribed fires	Nothing major, few lightning strikes, no major forest fires
	commercial logging	none
	thinning	Some commercial stewardship contracts are active
	fuel-wooding	scattered across watershed, limited to local use, no commercial sales
	recreation	scattered across allotment in accessible areas: hiking & hunting
	OHV use	limited but increasing trends, use is increasing in popular camping areas

Allotment Name	Reasonably Anticipated Future Effects	Affected Area for Future Effects
Cerro Trigo	livestock grazing	whole watershed is anticipated to be grazed including all the allotment
	wildlife / elk grazing	Wildlife is anticipated to use entire area of the allotment, portions of the allotment are used for winter range for elk, antelope, turkey, etc.
	road maintenance	Little effects as allotment has low road mileage, maintenance is usually once per year
	road closures	Few anticipated closures but anticipate some closures w/TMR & new Forest Plan, little overall effect
	wildfires / prescribed fires	Based on past fire history, few future fires anticipated in and around the allotment.
	commercial logging / thinning	anticipate some amount of stewardship activity
	fuel-wooding	little effect to this allotment as it has few trees
	recreation	Little notable impact from recreation / hunting
	OHV use	anticipate more OHV use on allotment but netting little impact
	fencing	No major changes,
	water development	stock waters outside riparian spring areas to be repaired/upgraded in upland meadows near springs
Greens Peak	livestock grazing	whole watershed is anticipated to be grazed
	wildlife / elk grazing	whole watershed is anticipated to be grazed, likely with increasing elk pressure
	road maintenance	Little change in impact over present maintenance levels
	road closures	Few new closures, though some are anticipated with new TMR and Forest Plan, this will only affect primitive roads
	wild fires / prescribed fires	Anticipate few wildfires, based on historic fire incidence
	commercial logging	anticipate more Stewardship/WUI contracts
	thinning	anticipate more Stewardship/WUI contracts
	fuel-wooding	Some degree of private fuel wooding, no commercial contracts
	recreation	Allotment is popular recreation area, anticipate some level of increased use, some continued elk hunting
	OHV use	Limited but increasing OHV use near recreation areas
	water development	new pipelines and drinkers planned off of existing or new spring boxes
Hall	livestock grazing	Whole allotment and watershed is anticipated to be grazed

	wildlife / elk grazing	Whole watershed is anticipated to be grazed, likely with increasing elk pressure over time
	road maintenance	only along system roads and county maintained roads, this has little overall impact
	road closures	Few, some primitive 2-tracks associated with inappropriate recreational use, closures after logging activity is standard operating procedure.
	wild fires / prescribed fires	Few fires anticipated based on fire history
	commercial logging / thinning	anticipate more Stewardship/WUI contracts
	fuel wooding	across allotment and watershed, limited to local use, no commercial sales
	recreation	across allotment and watershed: hiking & hunting, some of this allotment has very popular recreational sites.
	OHV use	OHV use is increasing with recreation use levels
	fencing	limited new fencing associated with wet meadows, may use temporary electric fencing
	water development	Repair of existing watering facilities is expected.

Wallow Fire

The Wallow Fire burned across 490,000 acres of the ASNFs. The Wallow Fire accounts for the most dramatic vegetation change across the ASNFs in recent history. The Cerro Trigo, Hall, or Green Peak allotments were not burned during the Wallow Fire and the nearest burned areas are 3 miles from the allotment boundaries. Reasonable foreseeable activities within the next three years include additional hazard tree removal in burned areas, pheromone traps for bark beetle prevention, trail maintenance and reconstruction, additional seeding and mulching in high severity burn areas, tree planting, recreation residence reconstruction, and fish barrier repair.

Range Vegetation and Livestock Use

Affected Environment

The Greens Peak Allotment (Figure 2) is an 11,823 acre allotment consisting of five pastures. The elevation ranges from 8,000 to 9,000 feet. Udall, Becker/Sherlock and North Springs pastures are predominantly open grassland with stands of mixed conifer on the rockier slopes and hillsides. Carnero pasture has some open grassland around Carnero Lake, and the north half is forested and bisected by drainages. Atascacita is a lower elevation pasture with an overstory of pinyon/juniper and understory dominated by blue grama. The stream below Carnero Spring is the only perennial stream on this allotment. Other drainages are intermittent or ephemeral and are dry most of the time. There are a number of wetlands within the allotment. Topography in forested areas generally ranges from 10-35% slope.

There are five grazing permittees, with permitted cattle numbers of 195 cow/calf pairs (c/c) and 33 c/c with season of use from 6/1 to 10/31, 45 c/c with season of use from 6/1 to 10/15, and 136 c/c and 52 c/c with season of use from 5/15 to 10/31 and 5/16 to 10/31 respectively, for a total of 2,423 AUMs.

Table 4. Current permitted use on the Greens Peak Allotment

Permittee	Head of Livestock	Type of Livestock	On/Off Dates
J. A. Brown Ranches, Inc.	195	Cattle and Horses	6/01 to 10/31
Norman and Karen Brown	33	Cow/Calf	6/01 to 10/31
Charles and Susan Waite	136	Cow/Calf	5/15 to 10/31
Delores Salazar	45	Cow/Calf	6/01 to 10/15
Hall Revocable Trust	52	Cow/Calf	5/16 to 10/31

Current Condition. Upland range monitoring sites in Udall, North Springs, and Becker-Sherlock pastures show Fair to Good range condition with upward trends based on increases in Arizona fescue and mountain muhly grasses. Upland range monitoring sites in Atascacita and Carnero pastures show mostly Fair to some Poor range condition with declining trends in vegetative composition, based on increases in blue grama grass and invasion of young pines onto the grasslands. However, in these blue-grama dominated sites ecological condition actually can be rated as mid-similarity to Potential Natural Vegetation based on Terrestrial Ecosystem map unit plant composition for the soil type. This system of assessment and ratings is better accepted as current science. Plant composition concerns in most sites in Atascacita pasture can be attributed to invasion of trees and long years of drought. However, declines in vegetative composition near Carnero Lake in Carnero pasture are considered to be also partly attributable to existing livestock management as well as other causes.

The Hall Allotment (figure 2) is a 14, 693 acre allotment consisting of five pastures. West CC pasture is predominantly open grassland with stands of mixed conifer hills. East CC, Udall and Little Giant pastures are mostly ponderosa pine with patches of aspen and spruce on the knolls with small open grasslands. Mallory is a lower elevation pasture to the north that contains pinyon/juniper transition dominated by blue grama. The elevation ranges from 7,700 to 8,257 feet. The topography on West CC is gently rolling open grassland whereas others have steep knolls with rolling hills. There are extensive wetland areas on the allotment, with West CC Pasture having the majority. During wet periods, the wetlands that entail the headwaters of Vernon Creek discharge sufficient water to yield flows within the subtle channels of the area. There are two grazing permittees. The current season of use is from June 1 – October 15 and the current permitted livestock numbers are 178 c/c and 355 c/c, for a total of 2,435 AUMs.

Table 5. Current permitted use on the Hall Allotment

Permittee	Head of Livestock	Type of Livestock	On/Off Dates
J. A. Brown Ranches, Inc.	178	Cow/Calf	6/01 to 10/15
Timberline Cattle Co.	355	Cow/Calf	6/01 to 10/15

Current Condition. Conditions across the allotment and within pastures vary considerably. Upland range monitoring sites in three pastures (Mallory, Lane and West CC) currently rate in Poor range condition, due mostly to higher percentages of blue grama than the Parker scoring system shows as desirable. The upland site in Little Giant pasture rates as Excellent condition. Sites in East CC pasture score in Fair condition. Upland sites in Udall pasture score Fair, Good and Excellent, while the Potato Patch meadow site, a major concentration area for impacts from livestock, wildlife and recreation, scored as Poor. Several drainages in the allotment have had nearly complete loss of riparian willow communities. In general, pinyon-juniper transition areas are in Poor range condition though most would rate as mid-similarity in ecological condition. As the elevation increases, so does range condition, and the Parker scorecards converge more with

ecological similarity ratings. The Parker scorecards devalue the presence of blue grama more than the ecological similarity plant compositions.

Sheep: The Morgan Mountain sheep driveway crosses the western portions of Hall and Greens Peak allotments. Two bands of 2,000 sheep, 1 horse, and 7 burros are trailed, and spend approximately 1.5 days on each allotment as they are driven to the Beehive/Sheep Springs allotments to summer, around the last week in May. The process is repeated on their return trip in mid-August.

The Cerro Trigo Allotment (figure 2), located approximately 11 miles west of Springerville, AZ, is a 2,582 acre allotment consisting of four pastures, and including 156 acres of private land, with grazing coordinated under a private land term permit. Kitchen Springs and Cerro Trigo Pastures border the Hall Allotment to the north. Atascacita Springs and Ted Hearn Pastures are near but not contiguous to Cerro Trigo and Kitchen springs Pastures. The dominant vegetation type in all four pastures is grassland associated with scattered ponderosa pine and mixed conifer forests on hillsides. The grasslands are dominated by blue grama, Arizona fescue and mountain muhly. Atascacita Draw is the main drainage on the allotment. There are some wetland areas within the allotment, associated with the more productive springs. The elevation ranges from 7,700 to 8,257 feet and the topography is relatively flat.

There is one grazing permittee. The current season of use is typically from 7/1 to 10/31 and the current permitted livestock number is 48 cow/calf pairs (41 term grazing permit and 7 term private permit), for 197 AUMs.

Table 6. Current permitted use on the Cerro Trigo Allotment

Permittee	Head of Livestock	Type of Livestock	On/Off Dates
J. A. Brown Ranches, Inc.	48	Cow/Calf	7/01 to 10/31

Current Condition. Range conditions across the allotment vary considerably. Roughly 37% of the cluster transects scored Good condition, 37% scored Poor, and the remaining 27% scored Fair, using the Parker 3-Step scorecards. There appear to be distribution problems, with livestock congregating in the easier to reach areas, while not grazing rockier sites. Portions of the Atascacita pasture consist largely of annuals.

The Range Vegetation specialist report includes details on the vegetative types and species compositions, and summaries of grazing-related monitoring. It also references monitoring data provided by a Hall allotment permittee.

Direct and Indirect Effects of Alternative 1

Effects Common to All the Allotments

If the no action alternative is chosen for any of the three allotments, following a phased-in livestock reduction period, no permitted livestock grazing would occur on the allotment for a ten-year period. No new grazing permit would be issued. Wild ungulate grazing is expected to continue during this ten-year period. Existing allotment boundary fences would not be removed. Remaining allotment boundary fence maintenance responsibilities would be distributed to adjacent permit holders.

Under this alternative, for any of the three allotments, livestock grazing would not occur and there would be no direct or indirect effects from livestock. The majority of the upland of the three allotments would be expected to decrease in productivity without disturbance except from relatively light wildlife use. Riparian vegetation, both herbaceous and especially woody, would

continue to bear heavier grazing pressure than uplands. Both short term and long term range condition and trend will be most affected by climatic conditions. Wildfire may maintain and improve ecological conditions in localized areas under the right conditions.

Greens Peak Allotment: Lack of livestock grazing would allow for a short term (<10 years) increase in litter, composition, density and vigor of plant community in upland meadows and subalpine grassland (30% of the allotment) and to a lesser extent in the Ponderosa pine and pinyon/juniper understory (28%). Vegetation diversity and density may not change much in stands of spruce/fir and mixed conifer (39% of the allotment) due to dense tree canopy cover.

This alternative may initially provide the best benefit to the plant community on up to 58% of the upland where potential exist for improvement in vegetation production for the short term (<10 years). Replacement of bare soil with live perennial plants would help reduce potential for establishment of exotic weeds.

However, over time (> 10 years) the vegetation on the upland may stabilize in the absence of disturbance. Wild ungulates would continue to concentrate in riparian areas. This situation has been widely observed in the sub-alpine grassland complexes, and upland vegetation (primarily Arizona fescue) in livestock-excluded conditions is often rated as decadent due to lack of disturbance (grazing, fire or insects) to promote new grass growth. Such changes may occur on the majority of the allotment (58%) where grassland, or grass understory exists. Lack of disturbance may lead to poor production and vigor, decreased species composition, increased bare ground and erosion, and increased invasive plants. Clary and Webster (1989) said that permanent removal of grazing would not guarantee maximum herbaceous plant production. Courtois et. al. (2004) found “few changes in vegetation characteristics between the inside and outside of [livestock] exclosures have occurred in 65 years, indicating that recovery rates have been similar under moderate grazing and exclusion”.

Hall Allotment: Lack of livestock grazing would allow for a short term (<10 years) increase in litter, composition, density and vigor of plant community in upland meadows and grasslands (26% of the allotment) and to a lesser extent in the Ponderosa pine and pinyon/juniper understory (35%). Vegetation diversity and density may not change much in stands of aspen, spruce/fir, and mixed conifer (39% of the allotment) due to dense tree canopy cover. Replacement of bare soil with live perennial plants would help reduce potential for establishment of exotic weeds.

This alternative may initially provide the best benefit to the plant community on up to 61% of the upland where potential exist for improvement in vegetation production for the short term (<10 years). The short term improvement in range condition and trend will be most affected by climatic conditions. However, over time (> 10 years) the vegetation on the upland may stabilize in the absence of livestock grazing disturbance. Wild ungulates will continue to concentrate in riparian areas. This situation has been widely observed in the sub-alpine grassland upland, and vegetation (primarily Arizona fescue) is often considered to be decadent due to lack of disturbance (grazing, fire or insects) to promote new grass growth (National Riparian Team forest visit in 2008). Such changes may occur on the majority of the allotment (61%) where grassland, or grass understory exists. Lack of disturbance may lead to poor production and vigor, decreased species composition, increased bare ground and erosion, and increased invasive plants. Clary and Webster (1989) said that permanent removal of grazing would not guarantee maximum herbaceous plant production. Courtois et. al. (2004) found “few changes in vegetation characteristics between the inside and outside of [livestock] exclosures have occurred in 65 years, indicating that recovery rates have been similar under moderate grazing and exclusion.”

No significant vegetation changes are expected to occur in the lower elevation blue grama dominated grasslands. Blue grama grass is expected to remain the dominant herbaceous species in absence of livestock grazing. Plant composition has not changed significantly over 50 years with light to moderate grazing impacts. It is believed that the blue grama grass ecosystem is in a steady ecological state, and unlikely to change in the absence of livestock. Holechek et. al. evaluated vegetative differences over a 6 year period on adjoining conservatively grazed and grazing excluded (22 years) shortgrass rangelands in northwestern New Mexico. The 6 year study (1999-2004) showed little difference in perennial grass standing crop, total vegetation cover, vegetation composition, or rangeland ecological conditions between adjacent areas receiving conservative winter grazing and long-term (22 year) grazing exclusion (Holechek et al, 2006).

Cerro Trigo Allotment: Lack of livestock grazing would allow for a short term (<10 years) increase in litter, composition, density and vigor of plant community in grasslands (51% of the allotment) and to a lesser extent in the Ponderosa pine and pinyon/juniper understory (42%). Replacement of bare soil with live perennial plants would help reduce potential for establishment of exotic weeds.

This alternative may initially provide the best benefit to the plant community on more than 51% of the upland where potential exist for improvement in vegetation production for the short term (<10 years). The short term improvement in range condition and trend will be most affected by climatic conditions.

However, over time (> 10 years) the vegetation on the upland may stabilize in the absence of livestock grazing disturbance. Wild ungulates would continue to concentrate in riparian areas. This situation has been widely observed in the sub-alpine grassland complexes, and vegetation (primarily Arizona fescue) is considered to be decadent due to lack of disturbance (grazing, fire or insects) to promote new grass growth. Such changes may occur on the majority of the allotment (61%) where grassland, or grass understory exists. Lack of disturbance may lead to poor production and vigor, decreased species composition, increased bare ground and erosion, and increased invasive plants. Clary and Webster (1989) said that permanent removal of grazing would not guarantee maximum herbaceous plant production. Courtois et al. (2004) found “few changes in vegetation characteristics between the inside and outside of [livestock] enclosures have occurred in 65 years, indicating that recovery rates have been similar under moderate grazing and exclusion.”

No significant vegetation changes are expected to occur in the lower elevation blue grama dominated grasslands under the no grazing alternative. Blue grama grass is expected to remain the dominant herbaceous species in absence of livestock grazing. Plant composition has not changed significantly over 50 years with light to moderate grazing impacts. It is believed that the blue grama grass ecosystem is in a steady ecological state, and unlikely to change in the absence of livestock. Holechek and associates evaluated vegetative differences over a 6 year period on adjoining conservatively grazed and grazing excluded (22 years) shortgrass rangelands in northwestern New Mexico. The six-year study (1999-2004) showed little difference in perennial grass standing crop, total vegetation cover, vegetation composition, or rangeland ecological conditions between adjacent areas receiving conservative winter grazing and long-term (22 year) grazing exclusion (Holechek et al, 2006).

Direct and Indirect Effects of Alternative 2

Under this alternative, livestock grazing would occur as described in the modified proposed action for each allotment (see Chapter 2). The planned authorization and adaptive management strategies would be used to mitigate these direct and indirect effects. Monitoring would support

management decisions, or identify needs for adjustments in timing, intensity, frequency, and duration of livestock grazing so that desired conditions may be met.

Livestock grazing can effect vegetation through consumption (utilization) and trampling. Conservative use (30-40%) in concert with proper stocking, distribution, and timing can provide maintenance and recovery of vegetation from grazing impacts (Holechek 2001). An adaptive management approach to grazing allows for adjustments to livestock management so grazing impacts to the plant community's productivity and diversity are not greater than natural variability. With this level of management, the timing and amount of precipitation are the primary drivers of the plant community.

Grazing animals consume portions of vegetation and can trample live vegetation, litter and seeds. While heavy use is detrimental to rangeland ecosystems, conservative use provides for recovery and sustainability of the plant community. Studies reviewed by Holechek (2001) conclude that managed livestock grazing can enhance rangeland vegetation by accelerating plant succession, increasing plant diversity, increasing plant productivity, and reducing plant mortality during drought. Holechek went on to say that these positive impacts of livestock grazing are most likely to occur when grazing intensities are light to conservative. Conservative use is defined as grazing intensity as depicted as a utilization level at the end of the growing season as 31% to 40% (FSH 2209.13 –Grazing Permit Administration Handbook Chapter 90 – Rangeland Management Decision-making, 2007).

In addition, disturbance is an important factor in plant community dynamics, and conservative grazing can provide needed disturbance. Management of livestock within the framework of grazing systems can change or limit impacts to the vegetation resource and the soils (White, 2004).

No significant vegetation changes are expected to occur in the lower elevation/blue grama dominated grasslands under the proposed action. Blue grama grass is expected to remain the dominant herbaceous species in absence of livestock grazing. Plant composition has not changed significantly over 50 years with light to moderate grazing impacts. It is believed that the blue grama ecosystem is in a steady ecological state. Holechek et. al. evaluated vegetative differences over a 6 year period on adjoining conservatively grazed and grazing excluded (22 years) shortgrass rangelands in northwestern New Mexico. The 6 year study (1999-2004) showed little difference in perennial grass standing crop, total vegetation cover, vegetation composition, or rangeland ecological conditions between adjacent areas receiving conservative winter grazing and long-term (22 year) grazing exclusion (Holechek et al, 2006).

Continual heavy use (>50 %) can result in reduced plant growth, production, and vigor depending on the timing of grazing, intensity and duration. Repeated grazing at high intensities would result in vegetation damage, and have negative impacts to the plant community. However, the allowable use levels for the three allotments in all vegetation types is set at or below 35 to 40 percent.

Under Alternative 2, ecological condition and trend is expected to be maintained or improved, within the bounds of natural variability. The ability of improvement in range condition and trend will be most affected by climatic conditions. With the implementation of the management guidelines, plant vigor, composition (warm and cool season species), density of desirable plants and forage production would continue to improve. Current bare soil newly covered by desirable perennial species would help reduce potential for establishment of exotic weeds.

Desirable riparian vegetation such as *Carex* spp., *Juncus* spp., and other hydric species may increase and trend towards Potential Natural Community (PNC). Riparian and meadow areas may still receive extensive use by wildlife during the critical growing season. Wildlife use of cool

season species would continue to be a concern in the spring time, particular in riparian areas. The management guidelines for proper forage utilization, grazing intensity and duration by livestock described in chapter 2 for this alternative, would be established to mitigate grazing effects, and are common to all three allotments. Conservative use will provide riparian vegetation of adequate height and cover to protect soil surfaces and dissipate energy during overland flows. Adaptive management strategies (as described in chapter 2 for this alternative) may be employed if monitoring indicates that authorized management is not meeting desired conditions, or to address localized resource issues.

All adaptive management strategies and improvements specified in Alternative 2 for the three allotments would have long term beneficial effects on vegetation resources as they are designed to better distribute livestock grazing. Some limited-area and short term vegetative disturbance, especially with pipelines and roadside water impoundment mechanical excavations, would occur if such improvements are constructed. They may not be required to achieve desired conditions. Monitoring will provide information to guide management decisions, including implementation of adaptive management strategies.

Management actions unique to Hall and Cerro Trigo allotments

The proposed action alternative would authorize a reconfiguration of the Hall allotment, based on its capacity, to be divided between Timberline Cattle Co. and J.A. Brown Ranches, which currently hold 2/3 and 1/3 of the permitted numbers on the Hall allotment respectively. Initial capacity estimates show West CC, East CC, and Udall pastures of the Hall allotment represent about 2/3 of the current capacity. Little Giant, Mallory, and Lane pastures represent 1/3 of the current capacity. The proposed action would combine Little Giant, Mallory, and Lane pastures with the Cerro Trigo allotment (permitted to J.A. Brown Ranches) into one allotment. The remaining pastures would still be considered the Hall allotment, under a new configuration and management strategy. This alternative is believed to provide more flexibility and control of livestock for each permittee to manage towards desired conditions for range vegetation. Grazing effects will be mitigated through the measures described above and adaptive management measures if needed.

Noxious and Invasive Weeds

Invasive weeds are defined as non-native plant species that aggressively invade native plant communities. Noxious weeds are those species officially designated by state or federal governments as deleterious. Weed species are usually introduced from beyond the environment in question, without the insects or diseases that keep them in check in their natural environment. Weeds in undeveloped lands occur in higher densities along roads and trails, ditches, corrals, campgrounds or trailheads, timber sale units, construction sites, and other areas where soils have been disturbed by vehicles or equipment. Livestock can carry weed seeds in their coats or manure, but experience in public lands show that the great majority of real world new infestations are associated with dirt from mechanical equipment (Tyser and Worley 1992; Tyser and Key 1988; Gelbard and Harrison 2003).

Undesired invasive plants are present in very low amounts on the three allotments, below the level of causing impacts. Mullein is the most common species. Such plants have established along roadsides, where sunny conditions and higher potential for seed introduction occur. Use of heavy equipment during fires and timber activities, and off-road use of vehicles have the potential to introduce weed seeds farther from roads. Current best management practices to prevent weed establishment include observing for weeds, pre-entry vehicle cleaning and use of weed-free straw. The Forest has a weed monitoring and control program, documented in the 2008 Decision and

Environmental Analysis for Weed Control (ASNF 2008), that is increasing in effectiveness. Implementation of the program will treat existing populations and minimize new establishments.

Direct and Indirect Effects of Alternative 1

Under this alternative, there would be no change to the potential introduction of new species. Ground disturbing activities, roads, and forest visitors would be the primary mechanism for noxious weed establishment. Monitoring and control measures for noxious weeds conducted by the forest would continue.

Direct and Indirect Effects of Alternative 2

Livestock can be a carrier of noxious weed seed. The proposed action would authorize livestock use, and would increase opportunity for noxious weed establishment, but to a minimal extent as shown by current weed patterns. Proposed water improvement projects would be ground disturbing and involve vehicles and equipment, and could carry potential for noxious weed establishment. Potential risk can be mitigated by Best Management Practices found in the project record. Proposed water developments are also expected to reduce potential infestation in other areas by reducing areas of concentration and improving ground cover in localized spots. By implementing the forestwide weed control program, infestations will be identified and confined. The proposed action is not expected to significantly increase the potential for noxious weed establishment.

Cumulative Effects for Vegetation and Weeds

The geographical extent of the cumulative effects analysis will include each of the three allotments and surrounding allotments. Past, present and future foreseeable action on the analysis area that would have an effect on vegetation resources and noxious weeds include: livestock grazing, wildlife grazing, timber thinning, fire, and recreational activities.

Wildlife would continue to graze on the allotment, concentrating in riparian areas and creating localized impacts. The degree of disturbance and intensity of impacts to riparian vegetation would be primarily dependent on elk populations, which are affected by Arizona Game and Fish hunt numbers, and annual climatic condition. Cumulatively, livestock grazing on the allotment when considered with Wallow Fire effects would contribute negligible effects to allotment vegetation due to the allotments location outside the Wallow Fire burn perimeter.

Livestock grazing has occurred within the three allotments for over 100 years. Livestock grazing historically occurred at higher numbers during the early to mid-20th century likely altering vegetative conditions, particularly in wet meadows and riparian areas. Livestock grazing would likely continue on the surrounding allotments and the adjoining Reservation. Livestock grazing in these allotments should not have any negative effects to the vegetation on the allotment.

The Morgan Mountain sheep driveway crosses the western portions of Hall and Greens Peak allotments. This use has not been found to have a measurable additive effect to the plant communities found on West CC and Udall pastures of the Hall allotment, and Udall and Becker-Sherlock pastures of the Greens Peak allotment.

Thinning of the forest and prescribed fire would maintain or improve forest health by reducing canopy cover and increase herbaceous understory. It is expected that plant diversity, cover and vigor would increase following prescribed burning. Reduction in tree canopy and heavy fuels would reduce the threat of high severity wildfire. These projects have been implemented in the

past, and future projects are planned and associated with wildland/urban interface and stewardship projects. The cumulative effects are expected to be beneficial to vegetation resources.

Other authorized activities which are likely to continue include camping, hiking, hunting and vehicle use on un-surfaced roads. Effects from these activities are short term and primarily consist of minor ground disturbance in popular camping areas.

In the past, the Potato Patch meadow area of Hall allotment was the location of an active timber mill with associated construction, extensive vegetative disturbance and bare, compacted soil. It has remained a very popular camping area with lessened but continuing vehicle trampling effects. Given its history, the improvement to date has been impressive, but it still counts as needing further improvement.

Riparian, Watershed/Hydrology, Soil Condition

Affected Environment

Cerro Trigo Allotment

Vegetation Types: Cerro Trigo allotment consists of a mix of vegetation types from blue grama dominated grasslands through large expanses of pinyon / juniper woodlands and Ponderosa pine, montane meadows dominated by high elevation species such as Arizona fescue, to a few north facing slopes on steep cinder cones dominated with mixed conifer. Most of the forage base is located in the montane meadows and the blue grama grasslands. The forested portion of the allotment naturally contains relatively little forage as shading and deep litter layers suppress most graminoids.

Ground cover and watershed condition within forested areas (Ponderosa pine and mixed conifer) is high and consists dominantly of needle cast litter. High elevation meadows are dominated by bunch grasses as well as some litter cover, and including a percentage of bare soil which is natural. Ground cover in pinyon / juniper and the blue grama dominated areas may be marginal in places, but overall is adequate for suppressing active erosion. In many areas of pinyon / juniper, most litter cover is found beneath the tree canopy and the interspaces between trees often lack adequate cover. This can be a function of tree density with associated allelopathy and water competition, and reversing the situation is the objective of land treatments involving removal of trees. The blue grama dominated meadows currently have adequate ground cover in terms of meeting USLE tolerance thresholds. The bare ground component within blue grama meadows has potential to become vegetated with additional grasses and to provide more ground cover as well as more forage. Current erosion rates in all vegetation types are generally below threshold levels (USLE tolerance rates) as there are no large expanses of bare ground.

Riparian resources: Cerro Trigo allotment has a few limited riparian and wetland resources. These areas are mostly “patches” around springs rather than extensive reaches down drainages. Atascacita Springs supports a riparian area in the immediate vicinity of the springs, however flows are insufficient to extend far downstream. A portion of the flows are captured and diverted down a pipeline to supply livestock water on state lands to the north, and some is captured for potable water used by adjacent residents. Most of the Atascacita Springs riparian area is within an enclosure fence and is in Proper Functioning Condition (PFC). Directly outside of the fence there is 10-15 acres dominated by lower-seral native species (cosmos and iris). Little Giant Spring is a series of springs most of which are located inside enclosure fencing. Spring boxes and piping supply clean water to troughs outside the fence; however, the wet meadows around the springs still have adequate moisture to maintain healthy wetland functions. The Little Giant area meets all requirements in terms of functionality. Fran Day Spring and another spring just to the west both

are in good hydrologic condition, though vegetation has type converted from sedges to non-native bluegrass. The meadows adjacent to the springs are very small, too small to be effectively managed in terms of achieving stubble height goals. The Kitchen Springs area has some potential for improvement. The spring furthest east used to be fenced and needs to be re-fenced as trampling is causing the springs to clog with silt, and the adjacent wetland may have potential for wildlife habitat. The area could supply water to a drinker with a new spring box and pipeline. The main portion of Kitchen Springs has an enclosure which demonstrates growth potential of the wetland vegetation. A third spring lies to the west of the main portion of Kitchen Springs and it flows into a small excavated tank. This area is in satisfactory condition. Mallory Spring now has very little wetland value, because the spring was excavated to form a tank. Very little wetland vegetation is left around the tank.

Greens Peak Allotment

Vegetation Types: Vegetation types are dominated by dense canopy cover of mixed conifer/aspen and some ponderosa pine with little understory vegetation. Montane meadows occupy most of the remaining areas and consist of native bunchgrasses. Greens Peak Allotment has very little acreage of riparian areas. The largest of the riparian areas is at Carnero Springs, which supports a small lotic (running water stream) riparian channel below the springs. A sizable lentic area (meadow-type with no perennial stream channel) is found surrounding Carnero Lake, which has emergent vegetation covering almost the entire lake. Additionally, scattered lentic riparian areas are found across the allotment in association with springs.

Ground Cover and Watershed Condition: The forested portion of the allotment has little herbaceous forage component in the understory. Ground cover consists dominantly of needle cast and partially decayed litter. High elevation montane meadows are dominated by bunch grasses and litter cover, and include a degree of bare soil. The montane meadows currently have adequate cover in terms of meeting USLE tolerance thresholds. The bare ground component within these bunchgrass dominated meadows has potential to become vegetated with additional grasses to provide more ground cover and more forage. Current erosion rates in all vegetation types are generally below threshold levels (USLE tolerance rates) as there are no large expanses of bare ground. The few riparian areas found on Greens Peak Allotment generally are satisfactory in terms of watershed condition and no areas of accelerated erosion were found. The montane meadows adjacent and in the vicinity of Carnero Lake appeared to be in less than desirable condition, because composition was dominated by lower-seral forbs and annuals rather than native bunch grasses. In terms of watershed condition, this forb and annual dominated area leaves much to be desired. The dominant areas of concern are east of Carnero Lake and along the ditch that feeds the lake from the south; all of which is within Carnero Pasture.

Riparian Resources: There are few riparian areas, the largest is at Carnero Springs, which supports a small running water riparian channel (lotic) below the springs. Due to being dependent on spring flow, this channel does not have much of a peak flow. The watershed flowing into this channel is fairly small, however it is conceivable that rapid snowmelt or a large summer monsoon would contribute harmful levels of discharge.

The small wetland associated with springs near Sherlock Draw Tank No. 1 within Becker-Sherlock Pasture is near-satisfactory, and can be improved to PFC within a year or two of maintaining eight inch stubble heights going into winter, thus increasing soil cover and streambank protection. This area may be turned into a fenced wildlife area, however leaving access to the tank itself.

The area near Swinborne Spring and Tank has some headcuts starting to form at the lower end of the wet meadow. This area has type-converted into non-native Kentucky bluegrass, and that species' small and shallow root mass leaves this area even more susceptible to gully cutting. This

may need to be addressed through temporary fencing that allows stubble heights to reach full potential. This may not be enough to stop these headcuts and active improvement may become necessary.

Hall Allotment

Vegetation Types: Vegetation types are dominated by high elevation types of montane grasslands, mixed conifer spruce / fir / aspen types, and some ponderosa pine with mixed conifer. There are some significant riparian lentic areas in places containing springs. There is very little lotic riparian vegetation type on this allotment. The riparian vegetation is of typical lentic composition, dominated by sedges and Kentucky bluegrass, and very few shrubs (willows) remain in the area.

Ground Cover and Watershed Condition: Within forested areas ground cover is high and consists predominantly of needle cast litter with some scarce live understory vegetation. High elevation montane meadows are dominated by bunch grasses as well as some litter cover, and include percentages of bare soil. The montane meadows currently have adequate cover in terms of meeting USLE tolerance thresholds; however there is room for improvement. The bare ground component within these bunchgrass dominated meadows has potential to become vegetated with additional live grass plants to provide more ground cover as well as more forage. Current erosion rates in all vegetation types are generally below threshold levels (USLE tolerance rates) as there are no large expanses of bare ground. There are a few localized headcuts located at the base of some meadows that are slowly eroding channels into the lentic meadows, however these can be repaired by maintaining long stubble heights going into fall. Areas of special concern, because of higher levels of impacts and /or soil conditions less than average for Hall riparian areas are Potato Patch and West CC pasture.

Riparian Resources: The West CC Pasture contains numerous springs that represent the headwaters to Vernon Creek. There is evidence that Bebb's willows were far more frequent at one time, however there currently is no natural reproduction of willow species and the few live plants that are left are in poor condition. The over-dominance of non-native bluegrasses is of concern. Kentucky and Canadian bluegrasses typically out-compete native sedges if the sod is maintained at very short stubble heights, and soil moisture levels are low enough to permit. Due to the palatability of sedges and bluegrasses, livestock prefer to stay in these areas and overgrazing readily occurs unless herding or fencing keeps animals out. Once bluegrasses take over lentic areas, it is extremely difficult to revert it back to native sedge composition unless the water table rises. The Udall Draw springs area is an example of nearly complete type conversion. Once this occurs, bluegrass does not provide adequate protection to keep soils in place during flood events and gully erosion can proceed rapidly. Signs of unacceptable erosion are starting to occur in West CC Pasture and Potato Patch. All allotment riparian areas would need close monitoring of herbivory to maintain adequate stubble heights going into winter.

Environmental Consequences

Alternative 1

Direct and Indirect Effects

Riparian Recovery is expected to accelerate and meet Forest Plan Standards in less time than the action alternative might allow. Native wetland species such as sedges and rushes would attain their potential height growth and protect wetland soils during spring snowmelt or during extreme summer rainfall events. This allows existing head-cuts or raw channels to heal in shortest time frames (example: Potato Patch in Hall Allotment). Woody riparian species such as various willows found growing in areas maintaining sufficient moisture would not be subjected to

livestock impacts including herbivory and soil compaction that contributes to root senescence. Willows would be expected to improve in health, perhaps even reproduce new young plants. Although these allotments have very few perennial streams, water quality downstream would be expected to improve as damaged wetlands recover and less sediment is transported downstream.

It is expected that existing wetland and riparian vegetation will positively respond from the no-grazing alternative, however it is doubtful that a decade of lower use will decrease composition of invading bluegrasses. Use by elk would continue. Most wetlands on these allotments are type converting to more of a dominant composition of bluegrasses (Kentucky and Canadian bluegrass). This is a result of past over-utilization which favors bluegrasses over native sedges and rushes in situations where stubble heights get grazed to extremely low levels, especially in fall going into winter, combined with lowered water tables.

Soil and Watershed Condition would be expected to improve more rapidly than under the action alternative. More ground cover would be expected to remain at year end, which helps reduce sheet wash and rill erosion. Soil compaction would recover faster due to lower amounts of direct impact from livestock trampling. Higher groundcover would also improve soil infiltration rates during snowmelt or rainfall, which in return increases percolation to ground water. Higher infiltration rates also reduce the amount of water left for surface runoff and resulting damage such as gully cutting and other forms of erosion. However, considering the effects of elk grazing, these benefits may be somewhat reduced.

A no-livestock-grazing alternative would theoretically contribute to higher water quality, but effects may not be directly measurable. Riparian condition would steadily improve, but have little impact over a large (HUC 5) scale. Resulting better riparian condition may contribute to higher infiltration rates on floodplains and wetlands and better wildlife habitat. Longer stubble heights going into winter would contribute to riparian recovery as well as improved fish habitat downstream (water quality and temperature).

Alternative 2

Direct and Indirect Effects

Construction of the adaptive management improvements proposed for all three alternatives, if they occurred, would involve direct ground disturbing activities, particularly the pipelines and roadside stock ponds. These activities would create bare soil, very limited in time and area, and offset by the improved livestock management resulting from their implementation.

Cerro Trigo Allotment

Riparian areas in Cerro Trigo Allotment: The new configuration of Cerro Trigo Allotment only has a few limited riparian and wetland areas as follows. Effects are discussed by each area.

1. Little Giant Spring is in a wetland meadow, with a pipe moving water out of the riparian area. Most of the meadow and spring areas are excluded and in good shape. No effects to this area are anticipated.
2. Atascacita Springs is also largely contained in an enclosure, however the springs extend beyond the fenced area. There is a small spring and saturated area on the west side of Atascacita which gets used quite regularly by livestock and elk. The alternative proposes extending the enclosure to surround the unfenced springs, and extending a pipeline out from there. Piping water away from the springs area will help dissipate effects of livestock and support establishment of more desirable vegetation. As a direct effect, grazing impacts from both elk and livestock would be expected to slow the reestablishment of desirable species.

3. Kitchen Springs includes several springs and associated wetlands. Part of the wetlands are excluded in a small fenced area, however the eastern-most spring also needs fencing and piping out to a drinker, and this is being analyzed. The saturated area immediately near the springs is substantially impacted by ungulates that tend to dig around the wet area looking for water. This leads to plugging of the spring which lowers its production. Installing a spring box and piping the water out of the wetland to a drinker would be more efficient. It is expected this area will remain impacted by livestock that are drawn to water and wet meadow vegetation, until the enclosure fence and pipeline is constructed. The construction activities would involve short term ground disturbance that would be limited in area.
4. Mallory Spring will remain impacted by cattle watering directly out of the pond created by excavating the spring. When the spring was excavated, almost all wetland values were destroyed. The area was designed to be piped out of a fenced area, however the plumbing no longer functions and needs repair. If drinkers could be provided outside the fence, at least some wetland vegetation can exist. As is, the area remains a concentration area and no wetland values are expected to re-establish.
5. Fran Day Spring consists of fenced springs with a spring box piping water to a drinker. The area is associated with a small meadow of about an acre in size which is used by ungulates. The location of the spring is in a small valley which is conducive to animals watering and resting or lingering near the trough. This applies to elk as well as livestock. The meadow appears largely type converted to bluegrasses and is not expected to change composition back to more native sedges and rushes under the proposed action. No immediate and obvious watershed damage was noted in the area, and none is anticipated to occur. Immediately to the west, another small seep occurs in a small depression, which was in similar condition as the Fran Day area.

Soils and Watershed Issues on Cerro Trigo Allotment: Wet soils are prone to compaction which may lead to concentration of flows in lentic areas that further leads to headcutting and gullyng. In lentic meadows, this can lead to incised channels and draining of stored soil moisture triggering type conversion from native sedge / rush vegetation types to bluegrass meadows. Bluegrasses (non-native Kentucky and Canadian) do not function well under flooded conditions and do not produce near the forage quantity that native species can. With the new configuration of this allotment, wet meadow overuse may be less of a problem as more upland meadow becomes available for grazing. There are several mitigation measures built into the grazing plan that further help ensure these areas will either get enough rest before winter, or they will be isolated by mitigation measures (temporary or permanent fencing, herding, etc.). Overall, there are few wet areas on the allotment and direct or indirect impacts would be concentrated on few desirable wet areas. The proposal's stubble height guidelines address this concern.

In lotic and lentic riparian areas (streams and wetlands), livestock impacts are mostly direct and on-site, rather than cumulative. Effects such as raw stream banks are the direct result of bank shearing by large ungulate hooves as well as removal of vegetation providing protective cover. This can become a cumulative watershed effect as sediment transport accumulates with channel distance if downstream channels are also in less than desirable condition. Sediment in streams is mainly handled through deposition on functioning floodplains, however if channels are incised and cannot reach floodplains, sediment stays in the channel and can increase with stream distance. It is difficult to attribute sediment to a specific single action such as an allotment or a given pasture thereof; however riparian condition is a good indicator of direct impacts. Effects to wet areas are expected to be limited on this allotment as there aren't many wet areas. However, concentration of use due to their desirability will still occur unless mitigation measures are continuously maintained, such as the stubble height guidelines.

Upland meadows: Upland meadows appear to be losing density of perennial grasses. The bare soil component of the meadow appears to be increasing. These are trends that have been documented all across montane meadows and grasslands and are not unique to this allotment. Cattle have likely contributed to these symptoms, while not being the sole cause. Proper livestock management would result in more litter left at the end of the grazing season, less soil compaction overall, and improved conditions for regeneration of new grass plants. The upland grazing allowable use of 30-40% addresses this.

Greens Peak Allotment:

Riparian Areas in Greens Peak Allotment: The confines of Greens Peak Allotment only has a few riparian and wetland areas as follows. Effects are discussed by each area.

- 1) Sherlock Draw Tank N. 1 consists of a long stringer of wet meadow vegetation fed by subsurface seepage. During dry years this has no standing water and impacts from livestock are minor. During wet years seepage is considerable and hummocking becomes evident, resulting from livestock use. The process involved is compaction of the interspaces between root crowns of perennial bunch grasses and sedges. This can eventually help drain the area if gullies form. There is a stock tank at the lower end of the meadow, which could remain available to livestock if the wet meadow were fenced. This would result in improved wildlife habitat in the meadow. Left as is, the area attracts livestock being a wet area, and trailing in and out of the area has led to undesirable trailing and terracing of the surrounding hillsides. An enclosure would help prevent this by directing animals to the tank and lingering would be less of a problem.
- 2) Swinborne Spring has an adjacent wet meadow that has largely type converted to bluegrass. Fencing this area to allow access to water is possible and would help maintain stubble height needed to stop the gulying and head-cutting that is starting to form near the lower end of the meadow.
- 3) North Spring Tank is in good shape and is not expected to be impacted much by livestock.
- 4) Carnero Springs does not show much impact from livestock and will not likely be impacted to great extent, though the area needs to be monitored to ensure maintenance of PFC conditions.
- 5) Carnero Springs drainage is in good condition below the springs in North Springs Pasture.
- 6) Wetlands around Carnero Lake are not expected to be impacted much by livestock.
- 7) Bear Wallow Tank is in good condition and not expected to be impacted much by livestock.
- 8) The wet meadow area around Udall Draw Springs may take some effort to allow stubble heights to remain adequate going into fall. This area gets a lot of use due to watering facilities, and the surrounding area is type converted to bluegrasses. Lowering use will help encourage the remaining native species (sedges) to proliferate. However allowing livestock to linger in the area will maintain bluegrass thatch, which eventually may form a gully to the north. Herding or fencing will be necessary to keep livestock from lingering.

Soils and Watershed Issues on Greens Peak Allotment: Wet soils are prone to compaction which may lead to concentration of flows in lentic areas that further leads to headcutting and gulying. In lentic meadows, this can lead to incised channels and draining of stored soil moisture triggering type conversion from native sedge / rush vegetation types to bluegrass meadows. Bluegrasses (non-native Kentucky and Canadian) do not function well under flooded conditions and do not produce near the forage quantity that native species can. As the attraction to wet areas

remains, herding etc. will be vital to maintain these areas before they turn to gullies. There are several mitigation measures built into the grazing plan that further help ensure these areas will either get enough rest before winter, or they can be isolated by other mitigation measures. Overall, there are relatively few wet areas on the allotment and direct or indirect impacts have historically been quite heavy. Many areas show old signs of willows but sign of regeneration is lacking. It is not expected that the proposed action will change this, however maintenance of adequate stubble height going into winter will be a start.

In lotic and lentic riparian areas (streams and wetlands), livestock impacts are mostly direct and on-site, rather than cumulative. Effects such as raw stream banks are the direct result of bank shearing by large ungulate hooves as well as removal of vegetation providing protective cover. This can become a cumulative watershed effect as sediment transport accumulates with channel distance if downstream channels are also in less than desirable condition. Sediment in streams is mainly handled through deposition on functioning floodplains, however if channels are incised and cannot reach floodplains, sediment stays in the channel and can increase with stream distance. It is difficult to attribute sediment to a specific single action such as an allotment or a given pasture thereof; however riparian condition is a good indicator of direct impacts. Effects to wet areas would be expected on this allotment, which is why these areas are now critical areas with stubble height guidelines.

Upland meadows: Upland meadows appear to be losing density of perennial grasses. The bare soil component of the meadow appears to be increasing. These are trends that have been documented all across montane meadows and grasslands and are not unique to this allotment. Cattle have likely contributed to these symptoms, while not being the sole cause. Proper livestock management would result in more litter left at the end of the grazing season, less soil compaction overall, and improved conditions for regeneration of new grass plants. The upland grazing allowable use of 30-40% (less in goshawk areas) addresses this.

Hall Allotment:

Riparian Areas in Hall Allotment: The confines of the new configuration of Hall Allotment has quite a few riparian and wetland areas as follows. Effects are discussed by each area.

- 1) West CC pasture contains the headwaters of Vernon Creek at the north side of the pasture. Channels in this area have raw channel banks, occasional small head-cuts, and areas where bluegrasses are taking over native sedge vegetation. If stubble heights are maintained, especially going into fall/winter, this is expected to improve. Herding or other means or redistribution is expected to help. Stubble height requirements are expected to allow raw banks to heal.
- 2) East CC Pasture contains two areas that will need continuous attention. The wet meadow near Aspen Tank, and the meadow leading north out of the Udall Park tanks area would need monitoring to allow acceptable stubble heights to form. This is expected to be challenging as much of the native wet meadow species have been crowded out by bluegrasses, however acceptable stubble heights are expected to help maintain the remaining natives. It is not expected that areas taken over by bluegrasses will revert back to being dominated by native composition.
- 3) Udall Pasture contains the Potato Patch area which will need attention to allow recovery. Stubble height requirements are expected to help heal the head-cuts and gullies starting to form, and it will also help maintain native sedges. If the area gets less or no use, recovery of severely compacted wet meadow soils is expected to gradually recover and allow storage of more soil moisture, which will encourage sedges. However, on slopes it is not expected that soils can stay wet enough to drown bluegrasses out – so the overall composition will not likely change, such as the Udall Draw Springs area. After repairing

- the infrastructure in this area, piping water out of the area and perhaps restricting use will help recover the area.
- 4) The wet meadow around Driveway Spring will need close monitoring to maintain stubble heights going into winter. This area is also type converting from native sedges to bluegrasses and a few raw spots are starting to form. Stubble height requirements are expected to help heal this area, but it will need constant attention to keep livestock from lingering.
 - 5) The wet meadows around Pipeline Springs and Burnt Mill Spring are in good shape and regular monitoring will maintain conditions.

Soils and Watershed Issues on Hall Allotment: Wet soils are prone to compaction which may lead to concentration of flows in lentic areas that further leads to headcutting and gullyng. In lentic meadows, this can lead to incised channels and draining of stored soil moisture triggering type conversion from native sedge / rush vegetation types to bluegrass meadows. Bluegrasses (non-native Kentucky and Canadian) do not function well under flooded conditions and do not produce near the forage quantity that native species can. As the attraction to wet areas remains, herding etc. will be vital to maintain these areas before they turn to gullies. There are several mitigation measures built into the grazing plan that further help ensure these areas will either get enough rest before winter, or they can be isolated by other mitigation measures. Overall, there are relatively few wet areas on the allotment and direct or indirect impacts have historically been quite heavy. Many areas show old signs of willow but sign of regeneration is lacking. It is not expected that the proposed action will change this, however maintenance of adequate stubble height going into winter will be a start.

In lotic and lentic riparian areas (streams and wetlands), livestock impacts are mostly direct and on-site, rather than cumulative. Effects such as raw stream banks are the direct result of bank shearing by large ungulate hooves as well as removal of vegetation providing protective cover. This can become a cumulative effect as sediment transport accumulates with channel distance if downstream channels are also in less than desirable condition. Sediment in streams is mainly handled through deposition on functioning floodplains, however if channels are incised and cannot reach floodplains, sediment stays in the channel and can increase with stream distance. It is difficult to attribute sediment to a specific single action such as an allotment or a given pasture thereof; however riparian condition is a good indicator of direct impacts. Effects to wet areas are expected on this allotment, which is why these areas are now critical areas with stubble height guidelines under the proposed action.

Upland meadows: Upland meadows appear to be losing density of perennial grasses. The bare soil component of the meadow appears to be increasing. These are trends that have been documented all across montane meadows and grasslands and are not unique to this allotment. Cattle have likely contributed to these symptoms, while not being the sole cause. Proper livestock management can positively affect would result in more litter left at the end of the grazing season, less soil compaction overall, and improved conditions for regeneration of new grass plants. The upland grazing allowable use of 30-40% (less in goshawk areas) addresses this.

Cumulative Effects

The potential impacts to the watersheds as a whole are small and become insignificant due to each allotment's small relative size to the whole. The cumulative effect of these allotments in conjunction with other projects in the watershed is discussed. Cumulatively, livestock grazing on the allotments when considered with Wallow Fire effects would contribute negligible effects to watersheds on the allotments, due to the small size of the allotments and their location outside the Wallow Fire burn perimeter.

The Forest-wide Motorized Travel Management Plan has potential to limit effects to the project areas, however differences in impacts would be negligible at the HUC 5 or 6 watershed scale. The only difference could be in sediment yield, but most traffic occurs on maintained system roads which handle sediment and runoff according to BMPs.

The Morgan Mountain Sheep Driveway will likely impose less impact than it currently does. In the recently approved proposed action of the Sheep Driveway analysis, a number of sensitive areas will be avoided to allow rest and recovery. Most of the sheep driveway is not in the same HUC 6 watershed as the allotments of this analysis. A small portion of the driveway cuts through the Hall and Greens Peak Allotments and forage allocations for the sheep have been made while calculating authorized animal unit months. More information regarding forage availability is found in the range specialist report.

The effects of livestock grazing on the allotments in conjunction with other minor activities within the watershed would become insignificant or impossible to discern on the watershed scale.

Cerro Trigo Allotment Cumulative Effects:

- 1) The cumulative effects of wildlife and livestock grazing may make it more difficult to obtain or maintain stubble height guidelines in riparian or wetland areas. This will be addressed through mitigation measures (adaptive management). If livestock effects have been removed and effects from wildlife (elk) are still unsatisfactory, this will need to be addressed with Az. Dept. of Game and Fish who may need to find other means of accomplishing our wetland goals.

The combined effects of livestock and elk grazing may negatively affect areas that have less than desirable composition by maintaining current undesirable forb cover, or allowing them to expand. As these areas are not specifically addressed in the alternatives, they will need close monitoring to keep use minimized (near Atascacita Springs). Even total exclosure is not expected to restore desirable native composition to these areas.

- 2) It is not expected that Cerro Trigo allotment will generate or add to negative downstream effects in terms of runoff or sedimentation. Maintenance of proper utilization levels, stubble heights and ground cover are expected to negate what impacts there are to soil compaction and ground cover which can influence runoff and erosion potential.
- 3) It is not anticipated that Cerro Trigo allotment will be significantly impacted by stewardship or WUI projects in the future, however if some of this type activity occurs, it will likely reduce grazing impacts by daylighting the forest floor and allowing more forage plants to thrive where there currently is no forage. Once forage is significantly increased by these means, modest increases in AUMs may be justified. However, it is not currently foreseen that such activity will make a large long-term difference to watershed outputs such as discharge, timing of flows, or sediment movement. Immediately after such projects are implemented, there normally occurs a spike in sediment discharge, but

this usually normalizes within a year or two, associated with the time it takes for needle cover and ground vegetation to re-establish.

- 4) There is a road-related area of concern on the east side of Cerro Trigo Mountain, where a large gully associated with a culvert is rendering the road almost unusable.

Greens Peak Allotment Cumulative Effects:

- 1) Although Greens Peak Allotment has relatively little riparian and wetland areas, the cumulative effects of wildlife and livestock grazing may make it more difficult to obtain or maintain stubble height guidelines in riparian or wetland areas. This will be addressed through mitigation measures (adaptive management), however may none the less remain difficult to achieve. If livestock effects have been removed and effects from wildlife (elk) are still unsatisfactory, this will need to be addressed with AZ. Dept. of Game and Fish who may need to find other means of accomplishing our wetland goals.

The combined effects of livestock and elk grazing may negatively affect areas that have less than desirable composition by maintaining current lower-seral plant cover, or actually allowing them to expand. As these areas are not specifically addressed in the alternatives they will need close monitoring to keep use minimized. Even total exclosure is not expected to restore desirable composition to these areas. Areas to keep close tabs on include the floodplain adjacent to the Carnero Springs drainage within Carnero Pasture, as well as the upland pasture in the vicinity of Carnero Lake. These areas both have a high forb component and do not produce adequate forage in current condition. Additionally, such areas where native composition has largely been converted to lower-seral forbs or annuals are prime candidates for noxious weed invasions. Close monitoring is critical in these areas and use may need to be further curtailed in order to allow recovery.

- 2) It is not expected that Greens Peak Allotment will generate or add to negative downstream effects in terms of runoff or sedimentation. Maintenance of proper utilization levels, stubble heights and ground cover are expected to negate what impacts there are to soil compaction and ground cover which can influence runoff and erosion potential. Significant portions of Green Peak Allotment consist of dense forest, which have no forage potential, and which are not used by livestock. These areas are normally in good condition in terms of soil condition and watershed condition due to their inherent high ground cover.
- 3) It is not anticipated that Greens Peak Allotment will be significantly impacted by stewardship or WUI projects in the future, however if some of this type activity occurs, it will likely reduce grazing impacts by day-lighting the forest floor and allowing more forage plants to thrive where there currently is no forage. Once forage is actually significantly increased by these means, modest increases in AUMs may be justified. However, it is not currently foreseen that such activity will make a large long-term difference to watershed outputs such as discharge, timing of flows, or sediment movement. Immediately after such projects are implemented, there normally occurs a spike in sediment discharge, but this usually normalizes within a year or two, associated with the time it takes for needle cover and ground vegetation to re-establish.

Hall Allotment Cumulative Effects:

- 1) Hall Allotment has a number of significant riparian and wetland areas. The cumulative effects of wildlife and livestock grazing may make it more difficult to obtain or maintain stubble height guidelines in riparian or wetland areas. This will need to be addressed through mitigation measures (adaptive management), however may none the less remain difficult to achieve. If livestock effects have been removed and effects from wildlife (elk) are still unsatisfactory, this will need to be addressed with Az. Dept. of Game and Fish who may need to find other means of accomplishing our wetland goals.

The combined effects of livestock and elk grazing may negatively affect small areas that have less than desirable composition, by maintaining current bluegrass composition. As these areas are not specifically addressed in the alternatives, they will need close monitoring to keep use minimized. Even total enclosure is not expected to restore desirable native composition to these areas. Specific areas where composition may soon be critical are in Potato Patch, the Udall Draw Spring area, and the northern half of West CC Pasture. All of these areas are becoming dominated by non-native bluegrasses and the remaining natives (sedges) need to be spared. If simply left to their own devices, such areas rarely recover by themselves and will need some sort of active intervention to get them reverted back to native composition.

- 2) It is not expected that Hall Allotment will generate or add to negative downstream effects in terms of runoff or sedimentation. Maintenance of proper utilization levels, stubble heights in riparian and wetland areas, and ground cover are expected to negate what impacts there are to soil compaction and ground cover which can influence runoff and erosion potential. Significant portions of Hall Allotment consist of dense forest, which have no forage potential, and which are not used by livestock. These areas are normally in good condition in terms of soil condition and watershed condition due to their inherent high ground cover.
- 3) It is not anticipated that Hall Allotment will be significantly impacted by stewardship or WUI projects in the future, however if some of this type activity occurs, it will likely reduce grazing impacts by day-lighting the forest floor and allowing more forage plants to thrive where there currently is no forage. The desired condition for Stewardship or WUI areas is to produce more live forage plants and less litter cover. Once forage is actually significantly increased by these means, modest increases in AUMs may be justified. However, it is not currently foreseen that such activity will make a large long-term difference to watershed outputs such as discharge, timing of flows, or sediment movement. Immediately after such projects are implemented, a small spike in sediment discharge normally occurs, but this usually normalizes within a year or two, associated with the time it takes for needle cover and ground vegetation to re-establish.

Air Quality

The area of analysis for air quality is large. It encompasses an area including the Mt. Baldy Wilderness (a Class 1 airshed). Most of the project area is downwind of the Mount Baldy air shed. Cerro Trigo, Greens Peak and Hall Allotments are approximately 10-15 miles north of the Mount Baldy Class 1 Airshed. There is some heavy industry that affects air quality in the area. This would include the coal-fired power plants located outside of Springerville, St. Johns and

Holbrook, as well as the pulp mill located near Snowflake. Issues of concern focus on air quality related parameters that this project has potential to affect.

The Arizona Department of Environmental Quality (ADEQ) has indicated that airsheds within the Springerville Ranger District are currently in attainment (satisfactory condition). As none of the project areas are within recognized non-attainment areas, no analysis is necessary to determine conformity with the state implementation plan for air quality.

Alternative 1- No Action

The project is not expected to have measurable direct or indirect effects to air quality under this alternative in any of the 3 allotments. No livestock would be present, and no incidental dust of any amount would be generated through the implementation of this alternative. Since there are no direct or indirect effects, there are no cumulative effects.

Alternative 2- Proposed Action

This project is not expected to have measurable direct or indirect effects to air quality under this alternative in any of the 3 allotments. Livestock would be present; however the amount of incidental dust attributable to grazing animals is not measurable and does not normally travel far before settling out. As there are no direct or indirect effects anticipated through implementation of the proposed action, there are no cumulative effects.

Heritage Resources

Affected Environment

The primary legislation governing Heritage Resource management is the National Historic Preservation Act (NHPA) of 1966 (amended in 1976, 1980, and 1992). Section 106 of NHPA requires that federal agencies take into consideration the effects of their undertakings on properties listed in or eligible to be nominated to the National Register of Historic Places (NHRP) (this includes both historic and prehistoric properties). In addition, Forest Service Manual 2360.6 provides the basis for specific Forest Service Heritage Resources management practices, and Appendix H of *The First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities* (PA) between the State Historic Preservation Officers of Arizona, New Mexico, Oklahoma, and Texas, and Region 3 of the U.S. Forest Service provides a framework for standard consultation protocol for Range Management projects.

Greens Peak Allotment

The Greens Peak allotment includes 12,125 acres, with elevations generally ranging between 8,000 and 9,900 feet. The allotment shares its northern boundary with both the Hall and Cerro Trigo allotments, and the Forest Boundary is located along a portion of the allotment's eastern boundary. The allotment includes many developed stock tanks, as well as several springs and Carnero Lake, a reservoir located in the central portion of the allotment. Although many of these modern water sources have been developed, they are a testament to the potential attractiveness of the area to the region's pre-contact inhabitants.

Eleven heritage resource inventories have been completed within portions of the allotment. Most of the surveys were linear, for road improvements and fuelbreaks. Three of the surveys were areas that employed less-than-complete survey strategies, inventorying a sample of the acreage. In this manner, approximately 9% of the allotment area has been inventoried for heritage resources. Almost all of the survey has focused on the southern half of the allotment, which generally contains the highest elevations.

Three archaeological sites have been documented. Two sites date to the prehistoric period, including an artifact scatter and a shrine. The third site is a historic trash scatter. Undocumented heritage resources, dating to both the pre-contact and historic times, may occur, particularly near the northern boundary, where elevations are lower. Historic sites and shrines associated with springs and locations of topographic prominence may also be encountered throughout the allotment.

Hall Allotment

The Hall Allotment includes 14,735 acres with elevations ranging from 10,933 at the summit of Greens Peak to approximately 7,500 feet at the northern boundary. The Forest Boundary delineates the northern extent of the allotment, where local elevation is as low as 7,400 feet. The Hall allotment borders the Cerro Trigo and the Greens Peak allotments to the east, north, and south and is the largest of the three.

Eight heritage resource inventories have been conducted. Five of these projects, totaling 394 acres (approximately 2.6% of the allotment) were subjected to complete survey. The remaining three inventories consisted of sample surveys of varying intensity. The majority of the survey coverage has been concentrated within the north-central portion, and there are significant areas in the very northern and southwestern portions of the allotment that have not been inventoried at all. A heritage resource review/survey has been completed related to this analysis, for construction of the small enclosure fences at Potato Patch meadow.

Four archaeological sites have been documented. Two sites are from the pre-contact period. Both sites occur on the tops of knolls and are classified as shrines. The remaining two sites are historical. One is a historic trash scatter; the other is the ruin of a small log cabin.

Site potential for pre-contact heritage resource sites remains highest in the lower-elevation areas found in the northern portion of the allotment, although the occurrence of shrines and other prehistoric limited activity sites may be expected farther to the south in the high elevation areas, particularly near springs or on the summits of knolls. Undocumented historic sites may also be encountered throughout the allotment.

Cerro Trigo Allotment

The Cerro Trigo Allotment is the smallest of the three allotments at approximately 2,580 acres. It is divided into two sections by the Hall allotment and abuts the Hall allotment to the east and west and the Greens Peak allotment to the south. The Cerro Trigo allotment also shares its northern and eastern boundary with the Forest boundary.

Two heritage resource inventories have been completed on a total of 368 acres, or 14.25 % of the allotment. A heritage resource review/survey has been completed related to this analysis, for expansion of the enclosure fence at Kitchen Springs.

One heritage resource site has been documented. It is a historic homestead located in the southern portion of the allotment. The northern portions of the area, where elevations are lower, are likely to yield additional pre-contact archaeological sites. Historic sites, as well as limited activity areas used during pre-contact times, could also be encountered throughout the allotment.

Desired Conditions

The desired future conditions for heritage resources include the inventory, documentation, and evaluation of all sites to Forest standards. Furthermore, management activities should promote the protection and preservation of heritage resources. Compliance with applicable laws and regulations, as well as the stipulations set forth in Appendix H of the *First Amended*

Programmatic Agreement Regarding Historic Property Protection and Responsibilities, as agreed upon by Region 3 of the U.S. Forest Service, the Arizona State Historic Preservation Officer, and other parties (PA) requires that appropriate inventories must be conducted in advance of the implementation of any ground-disturbing activities. Projects should be managed in such a manner that ensures a determination of either “No Historic Properties Affected” or “No Adverse Effect” to heritage resources, and discovery of any undocumented heritage resources during project implementation should result in immediate cessation of any ground disturbing activities in the locale and notification of the Forest Archaeologist.

Heritage Recommendations

The adaptive management actions in alternative 2 for all three allotments include new fence construction, existing fence maintenance and repair, erosion control, proposed spring developments, and water distribution and collection developments. These activities may be considered undertakings, depending upon the nature of the fence installation/removal activities. According to the Programmatic Agreement between the Forest Service and the State Historic Preservation Officer, maintenance, replacement, or reconstruction of existing facilities are not considered undertakings and do not require additional survey. However, to ensure that the requirements of Section 106 of the National Historic Preservation Act (NHPA) are met, any new range improvement projects scheduled to be constructed within two years that will result in ground-disturbing activity, were surveyed for heritage resources. All areas affected by possible future improvements will be surveyed prior to project implementation to make certain that there are no adverse effects upon heritage resources. In the event that heritage resources are discovered, project concurrence by the Arizona State Historic Preservation Officer will be sought.

Tribal and SHPO Consultation

The Advisory Council on Historic Preservation’s newly revised guidelines regarding the protection of historic properties (36 CFR 800) require an increased level of consultation with Indian tribes prior to the implementation of projects that have the potential to adversely affect traditional cultural places (TCPs) that hold special religious or other cultural value for Native Americans. To this end, the interdisciplinary team scoped and received comments on this EA from the Tribal governments with which the Apache-Sitgreaves NF’s regularly consults.

While TCP’s are not necessarily heritage resource sites, they are important places infused with spiritual and religious meaning to many Native American communities. Natural springs and the summits of knolls and mountains are often traditional cultural places, and each of the three allotments contain potential shrine sites. Therefore, any proposed projects that are in the vicinity of springs, or on the summits of prominent knolls or mountains have the potential to affect TCP’s (even if these projects are not considered undertakings by the AZ State SHPO) and will therefore require Tribal Consultation.

Project specific concurrence by the Arizona State Historic Preservation Officer was obtained on September 16, 2010, as stipulated in Appendix H of the PA. The signed document can be found in the project record.

Environmental Consequences

Neither of the alternatives being analyzed is expected to result in adverse impacts to heritage resources. Ground cover should increase, minimizing the effects of congregating cattle and wind and/or water erosion on heritage resources.

Management activities should promote the protection and preservation of heritage resources. Compliance with applicable laws and regulations, as well as the stipulations set forth in the PA requires that appropriate inventories must be conducted in advance of the implementation of any

ground-disturbing activities. Appendix H of the PA specifically addresses the subject of Rangeland Management. As is stated in the PA, Appendix H, page 3, “Achieving and maintaining allotment desired conditions is expected to benefit historical properties by providing improved vegetative cover and more stable soils, thereby reducing the potential for direct or indirect impacts to historic properties”.

The allotment management plans and annual operating instructions for the three allotments shall be developed in such a manner that ensures that no adverse effect or “no effect to historic properties” to heritage resources, as stipulated in the PA. Archaeological sites must be marked for avoidance in a conspicuous fashion and avoided by project activities that are considered undertakings as stipulated in the PA. Examples of undertakings, as they pertain to range improvement projects include, but are not limited to, allotment management plans, range improvement projects, water distribution facilities, and new fence construction. Project managers must consult with the Forest Archaeologist or appropriate Forest Service cultural resource specialist prior to any treatment implementation, or the activities will be considered out of compliance with Section 106 of the NRHP. Furthermore, upon discovery of any undocumented heritage resources during project implementation, work should cease in that area immediately and the Forest Archaeologist or another appropriate cultural resources specialist should be contacted.

Past actions on the three allotments have not resulted in adverse impacts to heritage resources. Protection of heritage resources as described above will be implemented on any future projects on the allotments. Because direct and indirect effects will be avoided, cumulative effects are precluded.

Cooperation and communication between project planners and heritage resources staff will ensure that this project remains in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and with Section 101(b)(4) of the National Environmental Policy Act of 1969.

Social / Economics

Affected Environment

The Greens Peak, Hall and Cerro Trigo allotments are located within Apache County. Livestock grazing contributes to the livelihood of the allotment permittees, and to the economy of local communities and counties. This section will discuss the situation and effects, based on economic contribution to social influences, the local economy, jobs provided and grazing receipts.

Social - Livestock grazing has been part of the Southwest culture for about 400 years, since the entry of the Spanish explorers, missionaries and settlers, though livestock in the area of the Apache-Sitgreaves N. F. (Forest) stayed at very low levels until conditions became generally safe for Anglo settlers and the railroad through northern Arizona was completed in the 1880s (Abruzzi, 1995). As Hispanic and Anglo settlers moved into the area, they found most forms of commercial agriculture were too restricted by climatic extremes and variability to be sustainable, but cattle and sheep ranching did prove able to support families and in part, communities (Abruzzi, 1987). Many of the grazing permittees of the Forest are descended from early Anglo or Hispanic settler families. Other permittees are first generation or part time ranchers, attracted by the cultural implications of ranching and a desired lifestyle.

Until about 1960, the economy of Apache County outside the Tribal lands was dominated by timber harvest and livestock ranching, using a mix of public and private lands. The social structures of the local communities were built around the owners and employees of these enterprises. As the twentieth century progressed, tourism and outdoor recreation became

increasingly important economic drivers, and communities expanded with second home and retirement home owners, and business people servicing the increasing population.

In 2003, Apache County's population was about 68,388. It consisted of about 77% Native American, 17% white non-Hispanic, 4% Hispanic, and 2% other or multi-racial (AZ Dept of Commerce, 2003).

Economics – Throughout the Mogollon Rim region of Arizona, over the past three decades, the economy has changed significantly. Where the ranching and timber industries were once the backbone of the local economy, service, government and recreation-based ventures now are much more important (White Mountain online, 2009).

Currently, outside the Tribal lands, agriculture, forestry, outfitting and mining together account for 3% of Apache County industry, employing just over 500 people (NAU, 2008).

Livestock still dominate the agricultural output in Apache County, making up 97% of the value of annual production. Dairy cattle makeup only 0.11% of cattle composition. There are only 25 acres of vegetable production reported, and 31 acres in reported orchards. The average value of agricultural products sold per farm/ranch is about \$22,800. Over 88% of the farms/ranches are operated by families or individuals. The average age of farm/ranch owners is reported as 56 years (City-data.com, 2009).

In 2005, agricultural employment deriving from the Forest was estimated at 142 part or full time jobs (USDA, 2005). These jobs are very likely all related to livestock grazing on the Forest. The total employment relating to the Forest was 3341 (USDA 2005).

Not all Forest permittees in Apache County depend on their livestock for full support. Some ranching families are diversifying their income by offering tourist-related operations such as outfit and guiding, and working ranch experiences. Others supplement their income with salaried employment.

Grazing Fee Receipts: Grazing fees are paid to the federal government per head-month (HM). 2009 fees are set at \$1.35 per HM, which is the floor set by an Executive Order by President Reagan prior to 1989, based on an expired law. Grazing fees in most of the years since this fee floor was established have not exceeded \$1.35/HM. One quarter of annual grazing fees go to the counties on which they were generated, for roads and schools. Another quarter goes to the U. S. Treasury (Cody, 1996). The remaining half goes to the Forest Service as the Range Betterment Fund, and come back to the Forest on which they were generated, mandated for use in improving range conditions and improvements. As with the vast majority of Forest Service programs, receipts from grazing fees do not cover the cost of program administration. In 2004, the grazing fee was \$1.43 per HM, while the General Accounting Office calculated the agency would have needed to charge @12.26/HM to recover costs (GAO 2005).

The three allotments have current term permitted maximum head months as follows, which would generate the following grazing fees if grazed:

	Head	
	Months	Fees
Greens Peak:	2433	\$3285
Hall:	2435	\$3287

Cerro Trigo:	168	\$227
TOTAL		\$6799

In 2008, the three allotments generated the following grazing fees from authorized livestock grazing (USFS, 2009):

	Head	
	Months	Fees
Greens Peak:	2191	\$2958
Hall:	1717	\$2318
Cerro Trigo:	166	\$224
TOTAL		\$5500

Environmental Consequences

An analysis of potential economic changes for each alternative is shown below. While values noted below appear very precise in measurement, they are based on certain assumptions as noted, thus they serve best as an indicator and general magnitude of change rather than a precise measurement. The impact of the allotments on three segments of the economy are shown in Table 8 which follows. The segments include: 1) economic contributions to the local economy 2) number of jobs provided and 3) annual grazing fee receipts.

“Economic contribution to the local economy” in the Table below, is derived from estimated expenditures per animal unit as indicated by a 1997 survey of Forest grazing permittees who indicated they spent an average of \$25,050 in direct expenses for their operations, in the local economy. Divided by an average of 845 owned head of adult livestock reported, this amounts to an average of \$29.64 spent per head for the total ranch operation (derived from Cosgrove 1998). (Five sheep are counted the same as one cow, yearlings as 0.7 of a cow.) We multiply this amount by 2.268 to account for an economic multiplier effect. This is consistent with the multiplier range used by a University of Arizona report on economic impacts from agriculture in Arizona, for range-fed cattle (Mortensen, 2004). We show two figures, one for the actual average grazing season on the allotments, and the other for 12 months, with the assumption that the Forest Service allotments allow for keeping that many cattle yearlong on the entire ranch operations involved.

“Jobs provided” is the total jobs directly and indirectly supported by the livestock operation. This is assumed to be 1.14 jobs per 100 animal-years or 0.00095 jobs/HM. This index was developed for the 1995 permit issuance project by the Forest Service’s Regional Office. We use only the Forest Service HMs for this calculation. Similarly, “Grazing Receipts” count only the Forest Service grazing fees paid, using the base \$1.35/HM to calculate this.

Table 7. Maximum HMs authorized under the alternatives

Allotment	Alternative 1	Alternative 3
Greens Peak	0	2433
Hall	0	1468

Cerro Trigo	0	969
TOTAL	0	4870 (about 942 cattle for 4.5 months)

Table 8. Summary of Alternatives Measured by Defined Indicators.

	Alternative 1 (No Action)	Alternative 2 (Modified Proposed Action)
Economic Contribution to to the Local Economy	\$0	\$23,746 (4.5 month) \$63,325 (yearlong)
Jobs Provided	0	4.6
Grazing Fee Receipts (\$1.35/HM, three allots.)	\$0	\$6575

Direct and Indirect Effects of Alternative 1

Under the No Action alternative, there would be costs to the Forest Service to remove some or all interior fences from the three allotments, perhaps up to \$30,000 for the labor costs of removal of wire and posts. The No Action alternative would result in the loss of fees to the Forest for range improvement and annual Federal payments to Apache County and the U. S. Treasury for livestock grazing for these three allotments. The No Action alternative could also result in reduction of revenue to the State and/or Federal government from abandonment of State or Bureau of Land Management land grazing leases, though if good access is available those leases most likely would be re-let to other ranchers.

This alternative would generate reduced economic contributions to the local economy from six reduced livestock operations, would not directly or indirectly provide jobs associated with grazing the three allotments. Lifestyle changes of ranch owners/employees in response to loss of income or increased debt could include decreasing spending, investing more time in other operations as means of alternate income opportunities, and further diversifying operations to make them less dependent upon public land ranching. It could also increase pressure to sell some private grazing land, reducing open space (Cosgrove 1998).

Cumulative Effects of Alternative 1

Several allotments on the Springerville Ranger District have recently been waived back to the Forest Service. Three permittees no longer graze livestock on the District and several other permittees have incurred reduction in permitted livestock numbers. Much of the areas of allotments waived back were densely forested with little available forage for livestock. Reconfiguration of allotment boundaries has occurred with retention of livestock grazing in pastures with more open forested or grassland conditions. These recent allotment reconfigurations have actually served to maintain and strengthen the ranching tradition by maintaining areas logical and practical for livestock grazing.

In addition to these reconfigurations, reductions in livestock numbers have resulted from previous analyses on adjacent allotments such as the Udall Allotment (2002), and Cross Bar allotment (2004). The reconfigurations and reductions in permitted livestock numbers have resulted in reductions in jobs provided, the contribution of ranching to local communities, and payments to

counties. Because ranching is such a small percentage of employment in the community, cumulative effects on economics of the No Action alternative do not result in a significant impact on local communities. Cumulatively, the number of those engaged in the ranching lifestyle has been reduced. However, livestock grazing permits are still in place on the District and are expected to continue. Allotment reconfigurations have retained acreage with forage available for livestock grazing and more intensive grazing management is occurring, resulting in more viable operations long term.

Reduction of livestock numbers has been occurring in the recent past on many allotments across the Forest as a whole, in order to balance livestock use with capacity and to improve resource conditions. If these reductions continue, ranching is not expected to play the same level of a social and economic role in the communities.

Population growth and demographic changes in eastern Arizona are expected to continue to contribute to economic growth and diversification. This will likely increase the opportunity for off-ranch income for ranchers. As growth continues in the White Mountains, the demand for rural home sites and other ventures is likely to increase the value of the private ranch land, regardless of the status of associated grazing permits. This may provide an alternate source of income for the permittees.

Direct and Indirect Effects of Alternative 2

The implementation of Alternative 2 would help to ensure the economic viability of the ranches associated with the allotments. As long as the permittees are able to function economically, the likelihood of selling their private land for developments is greatly diminished. Thus, this alternative also helps to maintain “open space” on the private land ranches associated with the allotments. When livestock grazing is allowed some income would be generated from grazing use on the National Forest System Lands.

Unlike Alternative 1, this alternative would provide an economic contribution to the local economy from a livestock operation, directly or indirectly provide jobs associated with livestock operations and would generate grazing receipts for the federal treasury.

Below are tables for each allotment showing the estimated costs if all the required and adaptive management improvements contained in Alternative 2 were implemented, and the most likely entity to pay. Only the descriptions listed in bold are required by the alternatives (one in Hall, one in Cerro Trigo); the others would be implemented only if indicated. We assume \$12,000/mile for four-strand fencing, with small enclosures somewhat more expensive:

Table 9. Greens Peak Projected Costs

DESCRIPTION	ALTERNATIVE 2
Riparian herder	Permittees: \$8900 per season at \$7.25/hour
Carnero Spr. Riparian fence 4 strand barbed wire	FS: \$6000 material Perms: \$6000 labor
Sherlock Draw riparian enclosure fence	AZ Dept. Game and Fish: \$6000 materials and labor
Ditch clean out – about ¾ mile	Permittee: equipment and labor - \$1200
Upland waters – up to 5	Permittees via grant: \$5000 each, up to \$25,000
Boundary fence reconstruction, up to 3.5 miles	FS: Up to \$21,000 materials Permittees: Up to \$21,000 labor

Spring source enclosure fences, about 1/8 mile each, plus trough and short pipe, up to four each	FS: \$2500 materials and labor each, up to \$10,000
Patterson pipeline extension, about 1 mile plus 2 troughs	Permittees via grant: \$6000
Total for FS	\$37,000
Total for permittees plus granting agencies	\$68,100
AGF total	\$6000
Grand Total	\$111,100

Table 10. Hall Projected Costs

DESCRIPTION	ALTERNATIVE 2
Two Potato Patch study enclosures, 4 strand fence	FS: \$1500 for two
Riparian herder	Permittee: \$7200 per season at \$7.25/hour
Potato Patch area electric division fence, about 2 mile	FS: \$10,000 materials Permittee: \$7000 labor
Upland waters – up to 2	Permittee via grant: \$5000 each, up to \$10,000
Boundary fence reconstruction, up to 2 3/4 miles	FS: Up to \$16,500 materials Permittees: Up to \$16,500 labor
Spring source enclosure fences, about 1/8 mile each, plus trough and short pipe, up to two each	FS: \$2500 materials and labor each, up to \$5,000
Udall Draw Spr/Tank – reconstruction, add 1.5 mile pipe, 2 troughs –or—install rooftop trick tank instead of spring work	FS: \$3000 materials or \$1500 materials Permittee: \$3000 labor or \$1500 labor
Burnt Mill Spr. – reconstruct spring, storage, pipe and troughs	Permittee via grant: \$9500 materials and labor
Clean Hidden Tank	Permittee: \$1500
One mile new pipeline, sections 3 and 4	Permittee via grant: \$3000
Total for FS	\$36,000
Total for permittees plus granting agencies	\$56,200
Grand Total	\$92,200

Table 11. Cerro Trigo Projected Costs

DESCRIPTION	ALTERNATIVE 2
Kitchen Spr. Enclosure expansion	FS: \$2000
Riparian herder	Permittee: \$7200 per season at \$7.25/hour
Boundary fence reconstruction, up to 8.5 miles	FS: Up to \$51,000 materials Permittee: Up to \$51,000 labor
Spring source enclosure fences, about 1/8 mile each, plus trough and short pipe, up to two each	FS: \$2500 materials and labor each, up to \$5,000
Upland waters – up to two	Permittee: \$5000 each, up to \$10,000
Burnt Mill pipeline - reconstruct ½ mile pipe, troughs	FS: \$2500 materials Permittee: \$2500 labor
New pipeline in Mallory – 1.5 miles and 1 trough	Permittee: \$7000

Atascacita Spr.pasture new pipeline – ½ mile and trough	FS: \$2000 materials Permittee: \$2000 labor
Second new pipeline in Mallory pasture – ¾ mile pipe and trough	Permittee: \$4000
Kitchen Spr. Pasture pipeline – 1.5 miles pipe and trough	Permittee: \$7000
Replace substation trough	FS: \$500 materials Permittee: \$500 labor
Create horse pasture – ¾ mile fence and gates	Permittee: \$10,000
Repair pipeline, troughs at Mallory Springs	Permittee: \$1500
Total for FS	\$63,000
Total for permittees plus any granting agencies	\$102,700
Grand Total	\$165,700

The only costs required by the action alternatives, to be paid by the Forest Service, are \$1500 for small study exclosures in Potato Patch in Hall allotment, and \$2000 to expand an exclosure at Cerro Trigo’s Kitchen Springs. The next most likely expenses, at least on a fairly short term basis, are permittees paying for herder labor if livestock impacts along riparian areas prove excessive. Since we are displaying the likely maximum costs, the herders were calculated at minimum wage for the entire grazing season of each allotment. A more likely scenario would be to use minimally paid or unpaid family labor, and only for those periods when cattle are in a pasture with a known overutilized riparian zone. Herders are likely to be replaced by the expanded development of water sources and/or new fencing after a few years.

Cumulative Effects of Alternative 2

Alternative 2 provides possible methods for the ranching lifestyle to continue to exist associated with the three allotments. If similar alternatives are selected across the Forest in upcoming analyses, the local ranching lifestyle would continue to exist in the area of the Apache-Sitgreaves National Forests. Cumulatively, livestock grazing on the allotments when considered with Wallow Fire effects would contribute negligible effects to the social and economic situation of the area.

Reduction of livestock numbers has been occurring in the recent past on many allotments across the Forest in order to balance livestock use with capacity and other uses of the land, such as increased wildlife occupancy. If these reductions continue, ranching is not expected to play the same level of a social and economic role in Apache County as at present.

Environmental Justice

Under Executive Order No. 12898 regarding Environmental Justice, federal agencies strive to ensure that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high or adverse manner by government programs and activities affecting human health or the environment. One goal of Environmental Justice is to provide the opportunity for minority and low-income populations to participate in planning, analysis, and decision making that affects their health or environment, including identification of program needs and designs.

The opportunity to comment on this environmental analysis was published in the Forest Service Schedule of Proposed Actions, posted on the Forest’s website, and invited by mail to possible interested parties. An interdisciplinary team of Forest Service personnel looked at the social, economic, and environmental impacts of this project and determined that none of the alternatives

considered in this analysis would have a disproportionate impact on any minority or low income population in the immediate area, within surrounding counties, in the eastern Arizona region, or nationally.

One of the six grazing permittees involved in the Greens Peak allotment is Hispanic-surnamed.

Environmental Consequences

None of the alternatives considered in this analysis would have a disproportionate impact on any minority or low-income population in the immediate area, within the involved counties, in Arizona or nationally. Because there are no direct or indirect effects, there are no cumulative effects.

Any livestock number reductions or increases, and costs associated with the alternatives, is expected to be assigned among the six on their current proportion of animal unit months for the allotment.

Terrestrial Wildlife

This analysis focuses on federally listed species, Forest Service sensitive species, migratory birds, and management indicator species. The specialist reports for wildlife and fisheries contain detailed information on the habitats, populations, and effects, and can be found in the project record.

Consistency with ASNFs Forests Land and Resource Management Plan Biological Opinion (A/S LRMP BO, 2012)

The Forest Service consulted on the eleven Land and Resource Management Plans (LRMP) for all National Forests and Grasslands in the Southwestern Region, and a final Biological and Conference Opinion (LRMP BO) was issued on June 10, 2005. In order to address a number of issues concerning the LRMP BO, the Forest Service reinitiated Endangered Species Act (ESA) Section 7 consultation with U.S. Fish and Wildlife Service (USFWS) in May 2010. Consultation was completed on April 30, 2012 with individual Biological Opinions for each Forest in the Southwestern Region. The new ASNFs LRMP BO (A/S LRMP BO, 2012) will henceforth be utilized. It is the current direction of the Southwestern Region to conduct a consistency check to determine whether an amendment to a LRMP would be consistent with the requirements of the A/S LRMP BO. A LRMP amendment is considered to be consistent with the A/S LRMP BO if:

1. It results in effects (to species and/or designated critical habitat) that were analyzed in the BO;
2. It does not result in exceeding the amount of take issued in the BO;
3. It meets the assumptions stated in the BO; and,
4. It would result in continuing to implement the Terms and Conditions of the BO.

Based on a review of the A/S LRMP BO in relation to proposed project activities, implementation of any of the alternatives proposed would be consistent with the new Apache-Sitgreaves LRMP Biological Opinion and no amendment to the LRMP would be necessary.

Federally Listed Threatened, Endangered and Proposed Candidate Species and Designated and Proposed Critical Habitat

The Forest federally listed and proposed species list was reviewed for all three allotments to determine species and or habitat present within the project area that could be impacted by the

proposed action (see Table 12). A Biological Assessment (BA) was prepared for the proposed action in 2009. The BA concluded that the implementation of this alternative **is not likely to adversely affect Mexican spotted owl and may effect, not likely to adversely modify MSO critical habitat, is not likely to jeopardize the continued existence of the Mexican gray wolf, and no effect to Southwestern willow flycatcher**. Informal consultation has been completed with concurrence finalized by the U.S. Fish & Wildlife Service on September 17, 2009. A review of the species list was completed in 2011 and determined the 2008 analysis is still current. More information on these species is included in Table 12 including acres of potential habitat in each allotment.

Southwestern willow flycatcher *Empidonax traillii extimus*- the species is a riparian willow dependent species. There is no occupied, unoccupied suitable, potential, or critical habitat on the allotments. No species occurrence is documented on the allotments. No habitat will be impacted by the proposed action. The closest occupied habitat is greater than 5 miles west in Greer. Because this potential habitat is unoccupied potential cowbird nest parasitism will not occur. Proposed grazing would occur outside the 5 mile distance from suitable occupied nesting habitat in Greer which reduces the potential for nest parasitism by cowbirds. **Determination of effects:** Under alternative 1 there would be no affect to Southwestern willow flycatcher in any of the three allotments because livestock would not be grazed. Alternative 2 would have no effect to southwestern willow flycatchers in any of the three allotments because no direct or indirect impacts to the species or its habitat are expected, no effect to critical habitat.

Mexican gray wolf *Canis lupus baileyi* - (Nonessential experimental population) the species is a habitat generalist and all of the allotments (29,266 acres) can be considered potential habitat. The species is known to occur and forage on the allotments. The allotment is within the secondary recovery zone. On January 12, 1998, the USFWS published an ESA section 10(j) rule establishing the reintroduced wolves as an “experimental population”. Current habitat conditions on the allotments would be considered suitable. Permitted livestock grazing was an activity included as a baseline of actions that the wolf could persist with. All wolf habitat on the allotment will be impacted by the proposed action. The grazing utilization levels established for this proposed action will maintain prey base habitat and maintain habitat quality for the gray wolf. **Determination of effects:** Under alternative 1, there would be no effect to this species in any of the three allotments. Under alternative 2 the quality and quantity of suitable habitat would not be measurably affected in any of the three allotments. Grazing utilization levels would maintain prey base habitat.

Mexican Spotted owl *Strix occidentalis lucida* –The species is a nocturnal forest species that prefers riparian and mixed conifer habitat. All three allotments provide some potential habitat (5,870 total acres). The habitat condition could be considered potentially suitable with further stand development to maturity. The species could occur on all three allotments and have the potential to be impacted. Potential MSO habitat exists on all the allotments. Hall and Cerro Trigo allotments have two small portions (6 and 28 acres) of established MSO PACs. Directs effects are expected to be discountable because cattle tend to avoid nesting roosting habitat located in dense forest and steep slopes. Indirect effects are expected to mitigated by the conservative utilization levels intended to provide for prey base habitat. **Determination of effects:** Under alternative 1, there would be no effect to this species in any of the three allotments. Under alternative 2 the quality and quantity of suitable habitat would not be measurably affected in any of the three allotments. Grazing utilization levels would maintain prey base habitat and critical habitat constituent elements in all three allotments.

Sensitive Species

The Southwestern Region (R3) Regional Forester's Sensitive Species list (September 2007) was reviewed to determine the species that could occur or that could have habitat in the project area (available in the project record). There are a total of 58 species within the Apache-Sitgreaves NFs. Seventeen plants and 10 other species were selected for further analysis because they either occur or have potential habitat in the project area. The species selected are included in Table 12. A biological evaluation was prepared as part of the Wildlife Specialist Report for this analysis and is included in the project record.

Table 12. Summary of Threatened, Endangered, Candidate & Sensitive Species Effects Determinations

Key to Abbreviations:

FEDERAL STATUS: **SEN** = Sensitive Species as determined by Regional Forester, 2007; **E** = Federally listed as endangered; **T** = Federally listed threatened; **PE, PT** = Proposed for federal listing as endangered or threatened; **C** = candidate species with FWS; **SOC** = Species of concern with FWS; **(ch)**: critical habitat designated; **(pch)**: proposed critical habitat; **(n)**: no critical habitat proposed or designated; **(sa)** critical habitat set aside by courts.

SPECIES STATUS ON DISTRICT: **S** = Presence of species documented and likely still occurs on the district; **S*** = Presence of species documented or likely to have occurred on the district, but likely no longer occurs; **Su** = Historic presence documented, but current status uncertain; **Sd** = Actions on the district may impact species downstream of district; **S?** = Presence of species not documented on the district but may occur due to presence of suitable habitat; **SB** = Breeding of species documented; **--** = species/habitat not likely to occur on the District; **CH**: Critical habitat occurs on District; **PCH**: Proposed critical habitat occurs on District. Critical Habitat in Action Area: **No** = No proposed or designated critical habitat is within action area; **Proposed, Final** = Proposed or designated critical habitat is within action area. Note that the action area may extend beyond the immediate project area.

			STATUS IN ACTION AREA			
FOREST-WIDE SPECIES LIST	FEDERAL STATUS	DISTRICT STATUS (06)	Critical Habitat	Known to Occur	Suitable Habitat Present	Alternative 2 Effects Summary
Mammals						
<i>Canis lupus baileyi</i> Mexican gray wolf; Nonessential experimental population	XN(n)/	S		Yes	29,266 total acres of potential habitat GP12,113 Hall 7617 CT9,536	Habitat: the species is a habitat generalist. Species may be present on all Allotments. Allotments with in secondary recovery zone. Species and denning activity has been documented in project area. Current habitat conditions are considered suitable. All potential habitat could be impacted by proposed action. Proposed action expected to maintain habitat conditions. Determination of effects: Is not likely to jeopardize continued existence of species (ee text BA for full discussion).
<i>Perognathus flavus goodpasteri</i> Springerville pocket mouse	SEN	S?		No	8,558 total acres of potential habitat GP 3,596 Hall 1,860	Habitat: Montane/subalpine grassland. Grassy cover important habitat component. Species not known to occur on allotments. Potential suitable habitat possible on all three Allotments in grassland habitat. Proposed action could impact all grassland habitat. Proposed action expected to maintain habitat conditions. Determination of effects: May impact individuals but not likely

					CT 3,102	to result in a trend toward federal listing or loss of species' viability.
<i>Spermophilus tridecemlineatus</i> White Mountains ground squirrel	SEN	S?	No		8,558 total acres of potential habitat GP 3,596 Hall 1,860 CT 3,102	Habitat: Montane/subalpine grassland. Grassy cover important habitat component. Species not known to occur on allotments. Potential suitable habitat possible on all three Allotments in grassland habitat. Proposed action could impact all grassland habitat. Proposed action expected to maintain habitat conditions. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability
<i>Tamias minimus arizonensis</i> White Mountains Chipmunk	SEN	S?	No		8,558 acres of potential habitat GP 3,596 Hall 1,860 CT 3,102	Habitat: Montane/subalpine grassland. Grassy cover important habitat component. Species not known to occur on allotments. Potential suitable habitat possible on all three Allotments in grassland habitat. Proposed action could impact all grassland habitat. Proposed action expected to maintain habitat conditions. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability
<i>Clethrionomys gapperi</i> Southern redbacked vole	SEN	S?	No		11,074 total acres of potential habitat GP 4,566 Hall 3,044 CT 9,536	Habitat: Montane/subalpine forest, mixed conifer. No occurrences documented on the allotments but potential habitat could occur. Current habitat conditions would be considered suitable with good grass cover for insect prey base. Proposed action would maintain or improve habitat conditions. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
<i>Microtus montanus arizonensis</i> Arizona Mountain vole	SEN	S?	No		11,074 total acres of potential habitat GP 4,566 Hall 3,044 CT 9,536	Habitat: Montane/subalpine forest, mixed conifer. No occurrences documented on the allotments but potential habitat could occur. Current habitat conditions would be considered suitable with good grass cover for insect prey base. Proposed action would maintain or improve habitat conditions. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
<i>Microtu longicaudus</i> Long-tailed vole	SEN	S?	No		14,428 total acres of potential	Habitat: Grassland, wetland/cienega, mixed conifer. No occurrences documented on the allotments but potential habitat could occur. Current habitat conditions would be

					habitat GP 6,591 Hall 3,757 CT 4,080	considered suitable with good grass cover for insect prey base. All potential habitat could be impacted by grazing. Proposed action would maintain or improve habitat conditions. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
<i>Zapus hudsonius luteus</i> New Mexican (Meadow) jumping mouse	SEN	S?		No	Potential habitat in small pockets of riparian habitat	Habitat: Grassland, willow habitat. Species not known to occur. Very small amounts of potential habitat on allotments Current potential habitat conditions are considered degraded because lack of grassy cover. Proposed action would establish minimum riparian grass heights that would improve habitat conditions. . Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
<i>Sorex merriami leucogenys</i> Merriam's Shrew	SEN	S?		No	29,266 total acres of potential habitat GP12,113 Hall 7617 CT 9,536	Habitat: Grassland, mixed conifer, pinyon-juniper woodland. No occurrences documented on the allotments but potential habitat could occur. Current habitat conditions would be considered suitable with good grass cover for insect prey base. Proposed action would maintain or improve habitat conditions. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
<i>Sorex Nanus</i> Dwarf Shrew	SEN	S?		No	29,266 total acres of potential habitat GP12,113 Hall 7617 CT 9,536	Habitat: Habitat generalist including mixed conifer, spruce fir, grassland, pinyon-juniper woodland. No occurrences documented on the allotments but potential habitat could occur. Current habitat conditions would be considered suitable with good grass cover for insect prey base. All potential habitat could be impacted by grazing. Proposed action would maintain or improve habitat conditions. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
<i>Euderma maculatum</i> Spotted bat	SEN	S?		No	29,266 total acres of	Habitat: Pinyon-juniper, mixed conifer, spruce fir, cliffs. No occurrences documented on the allotments but potential habitat

					potential habitat GP12,113 Hall 7617 CT 9,536	could occur. Current habitat conditions would be considered suitable with good grass cover for insect prey base and suitable nesting roosting habitat in snags and rocky outcrops. Nesting roosting habitat will not be impacted by proposed action. All foraging habitat could be impacted. The proposed grazing is expected to maintain or improve forging habitat. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
<i>Idionycteris phylloti</i> Allen's Lappet-brown Bat	SEN	S?		No	29,266 total acres of potential habitat GP12,113 Hall 7617 CT 9,536	Habitat: Pinyon-juniper, mixed conifer, spruce fir, cliffs. No occurrences documented on the allotments but potential habitat could occur. Current habitat conditions would be considered suitable with good grass cover for insect prey base and suitable nesting roosting habitat in snags and rocky outcrops. Nesting roosting habitat will not be impacted by proposed action. All foraging habitat could be impacted. The proposed grazing is expected to maintain or improve forging habitat. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
<i>Eumops perotis californicus</i> Greater Western Mastiff Bat	SEN	S?		No	29,266 total acres of potential habitat GP12,113 Hall 7617 CT 9,536	Habitat: Pinyon-juniper, mixed conifer, spruce fir, cliffs. No occurrences documented on the allotments but potential habitat could occur. Current habitat conditions would be considered suitable with good grass cover for insect prey base and suitable nesting roosting habitat in snags and rocky outcrops. Nesting roosting habitat will not be impacted by proposed action. All foraging habitat could be impacted. The proposed grazing is expected to maintain or improve forging habitat. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
Birds						
<i>Accipiter gentilis</i> Northern Goshawk	SEN	SB		Yes	29,226 total acres of potential habitat	Habitat: Habitat generalist including mixed conifer, ponderosa pine. Habitat present on all allotments. Suitable nesting and foraging habitat present. Project will not modify habitat structure but could impact prey species. Forage utilization levels

					GP12,113 Hall 7617 CT 9,536	established will provide for prey species habitat. Project may occur during breeding season. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
<i>Athene cunicularia hypugaea</i> Burrowing owl	SEN	S		No	18,162 total acres of potential habitat GP 6,847 Hall 2,777 CT 8,538	Habitat: Mixed broadleaf riparian, willow riparian, ponderosa pine, and p/j grassland. Closely associated with burrowing animals like prairie dog colonies. No occurrences documented on the allotment but potential habitat could occur on allotment although no prairie dog colonies exist on allotment. Current habitat conditions considered potential (with the exception of burrows) with areas of good grass cover and areas of disturbance with reduced cover for burrow site. Proposed action would maintain habitat conditions. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
STATUS IN ACTION AREA						
FOREST-WIDE SPECIES LIST	FEDERAL STATUS	DISTRICT STATUS (06)	Critical Habitat	Known to Occur	Suitable Habitat Present	Effects Summary
<i>Vireo vicinior</i> Grey Vireo	/SEN	Su		No	827 acres of potential habitat only on Greens Peak and Cerro Trigo	Habitat: P/j, woodland, chaparral, and desert scrub. Not know to occur on the allotments but potential habitat could exist in the form of p/j woodland. Current habitat conditions considered suitable with good grass cover to provide for insect prey base. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
<i>Empidonax traillii extimus</i> Southwestern Willow Flycatcher	E(n)/SEN	SB	No	No	No	No suitable or potentially suitable habitat. No critical habitat. Determination of effects: No effect
<i>Falco peregrinus anatum</i>	SEN	SB		Yes	29,266 total acres of	Habitat: Cliffs. No potentially occupiable cliffs on allotments. Nearest known eyrie (South Fork Canyon) greater than 5 miles

American Peregrine Falcon					potential foraging habitat GP12,113 Hall 7617 CT 9,536	away and within foraging radius of 10 miles. Low potential the allotments provide foraging habitat. Current potential foraging habitat is considered suitable and proposed action would maintain or improve habitat conditions. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species' viability.
<i>Haliaeetus leucocephalus</i> Bald Eagle	SEN	S		Yes	29,266 total acres of potential habitat GP12,113 Hall 7617 CT 9,536	Habitat: Riparian, desert scrub, chaparral, mixed conifer, pj, and ponderosa pine. Not known to nest or roost on the allotments however suitable foraging habitat occurs. Eagles are commonly observed foraging on Forest. Nesting has occurred at Greer Lakes 6 miles south. Current habitat conditions are considered suitable and proposed action will maintain or improve habitat conditions. Determination of effects: May impact individuals but not likely to result in a trend toward federal listing or loss of species viability.
<i>Strix occidentalis lucida</i> Mexican Spotted Owl	T(p)	S	Yes	Yes	5,870 total acres of potential habitat GP 2,995 Hall 1,897 CT 978	Habitat: Mixed conifer and riparian habitat. Potential habitat exists on all allotments. Portions of two PACs on Hall allotment. Habitat on allotments is considered potential because of young forest structure. Forest structure not impacted by grazing but prey base habitat can be impacted. The proposed action is intended to maintain or improve prey base habitat. Determination of effects: May affect not likely to adversely affect. See BA text for full discussion.

Direct and Indirect Effects to Forest Service Sensitive Species

Mammals

White Mountains ground squirrel, Springerville pocket mouse, Merriam's Shrew, Dwarf Shrew, White Mountains chipmunk, Southern redbacked vole, Arizona Montain vole, Long-tailed vole, New Mexican jumping mouse.

All these species are dependent on grass for cover, foraging, and or prey base habitat. None of these species are known to occur on any of the three allotments however potential and suitable habitat could occur on all three allotments. The entire potential habitat total for these 9 species on the allotments has the potential of being impacted by the proposed action.

Under alternative 1, there would be no impact to these 9 species or their habitat because livestock would not be grazed and vegetation would be expected to remain similar to the current condition. The proposed action, alternative 2 would allow for livestock grazing as described in the proposed action for each allotment. Grass cover along riparian habitat is expected to be maintained by the proposed stubble height standards proposed. The livestock forage utilizations levels proposed in the uplands are intended to provide for prey base and foraging habitat so indirect impacts are expected to be minimized. There are approximately 177,972 acres of potential habitat on the Forest. The allotment represents less than 1% of this potential habitat. Habitat quality is expected to be maintained on the allotment as a result of conservative forage utilization levels, conservative stocking levels, and proposed pasture rest. **Effects determination:** *Alternative 1: no effect. Alternative 2: may impact individuals but will not cause a loss of viability or a trend towards future listing (MIIH).*

Spotted bat, Allen's Lappet-brown bat, Greater Western Mastiff bat

None of these species are known to occur on any of the three allotments however potential and suitable habitat could occur. All potential bat foraging habitat on the allotments for these three species has the potential of being impacted by the proposed action, however nesting and roosting habitat would not be impacted by livestock grazing because these bats roost in snags and rocky outcrops.

Under alternative 1, there would be no impact to these three species or their habitat because livestock would not be grazed. The proposed action, alternative 2, would allow for livestock grazing as described in the proposed action. Grass cover along riparian habitat is expected to be maintained by the proposed stubble height standards proposed maintaining prey base habitat. The livestock forage utilizations levels proposed in the uplands are also intended to provide for prey base habitat so indirect impacts are expected to be minimized. The livestock forage utilizations levels proposed are intended to provide for prey base and foraging habitat so indirect impacts are expected to be minimized. These bats roost in snags or rocky outcrops, neither of which will be impacted by the proposed action. The Spotted bat and the Lappet-brown bat has approximately 782,474 potential acres forest-wide. The habitat for the Greater western mastiff bat is very limited across the forest. The allotment represents less than 1% of this potential habitat. Habitat quality is expected to be maintained on the allotment as a result of conservative forage utilization levels. **Effects determination-***Alternative 1: no effect. Alternative 2: may impact individuals will not cause a loss of viability or a trend towards future listing (MIIH).*

Birds - Burrowing owl, Grey Vireo, Bald Eagle, Northern Goshawk, American Peregrine Falcon

Of the five species with potential habitat on the three allotments, only the Bald eagle and Northern Goshawk are known to occur. Bald eagles are known to forage on the allotments but no roosting or nest sites are known. All three allotments provide foraging habitat for the Northern goshawk and nesting has been documented in Greens Peak allotment. Burrowing owls, Grey vireo, and Peregrine falcons have not been documented but potential foraging habitat is present on all three allotments. Burrowing owls are dependent on prairie dogs for nesting habitat. No prairie dogs are known on any of the allotments so the probability of burrowing owls occurring is unlikely.

Under alternative 1 there would be no impact to these five species or their habitat because livestock would not be grazed. The proposed action, alternative 2, would allow for livestock grazing as described in the proposed action for the three allotments. A key element in the proposed actions will provide for grass cover along riparian habitat by establishing stubble height standards which would maintain prey base habitat. The livestock forage utilization levels proposed in the uplands are also intended to provide for prey base habitat so indirect impacts are expected to be minimized. No nesting habitat is present on the allotments for burrowing owls and peregrine falcons so no impacts would occur. Northern Goshawks, Bald eagles and grey vireo nest in trees and snags, neither of which will be impacted by the proposed action. Burrowing owls utilize burrows from prairie dogs for nesting. No prairie dog colonies are known on the allotment. Burrowing owl has 192,642 potential acres forest-wide. Grey vireo has 417,566 potential acres forest-wide, and the bald eagle has 782,474 potential acres forest-wide. The allotment represents less than 1% of this potential habitat. Habitat quality is expected to be maintained on the allotment as a result of conservative forage utilization levels, and proper stocking levels. *Effects determination-Alternative 1: no effect. Alternative 2: may impact individuals will not cause a loss of viability or a trend towards future listing (MIIH).*

Sensitive Plants

For rare plants, we consulted the USFS Region 3 Sensitive Plant List dated September 21, 2007.

There have been no documented surveys for rare plants in the areas of the three grazing allotments, so we are assuming occupancy if acres of the vegetation type constituting habitat are found in the allotments. In the case of wetland/cienega and woody-dominated riparian types there are scattered occurrences in the three allotments that are too small to have been entered into the Terrestrial Ecosystem Unit database and reflected in the analysis.

As noted in the Purpose and Need for this analysis, the great majority of areas on the three grazing allotments currently meet desired conditions. The few areas not yet meeting desired conditions mostly occur in riparian areas, with less than desired soil cover occurring in grasslands and pinyon-juniper woodlands.

Under existing conditions, individual plants may be impacted from cattle grazing or trampling, especially in the riparian areas listed as not meeting desired conditions. Individual plants may be impacted from vehicles including in areas of motorized off-road travel, especially in the Potato Patch mesic meadow/riparian area.

Cumulatively, cross-country motorized use on the forests is considered to have moderate to high impacts in pinyon-juniper, ponderosa pine, and spruce-fir with wet mixed conifer habitats. Cross-country travel has the potential to influence behavior, survival, reproduction, and distribution of species reliant on these habitats, as well as alter the habitat. There are currently minimal impacts on species reliant on wetland and riparian habitats due to the fenced exclusion of many areas from motorized use. In areas where exclosures do not protect habitat, there is potential to adversely impact these species.

Elk also occupy and graze the three allotments, and occur in the areas at times when cattle are not allowed onto the allotments. Elk graze and trample very similarly to cattle, while occupying riparian areas a little less and upland vegetation types a little more than cattle.

Cutting of coniferous trees, both commercial and as fuelwood, has occurred and is likely to occur on all three allotments. This activity is associated with vehicles giving access to the cutting sites. Depending on the amount of trees cut, herbaceous and shrubby species can benefit from the lessened competition and greater sunlight.

Wildfires and prescribed burning occur in all the allotments. In the long term fires tend to have beneficial effects on populations of plant species, though they may kill individual plants.

Direct and Indirect Effect Determination

Under both alternatives and for all the sensitive plant species, the proposed livestock management “may impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species” (MIIH).

Table 14 – Summary of Effects Determinations for Forest Service Sensitive Plants

Sensitive Plant Species	Alternative A – No Grazing	Alternative B – Proposal
Greene milkweed	MAII	MAII
Villous groundcover milkvetch	MAII	MAII
White Mountains paintbrush	MAII	MAII
Gila thistle	MAII	MAII
Goodding’s Onion	MAII	MAII
Yellow lady’s slipper	MAII	MAII
Heathleaf wild buckwheat	MAII	MAII
Wislizeni gentian	MAII	MAII
Arizona sneezeweed	MAII	MAII
Arizona sunflower	MAII	MAII
Eastwood alum root	MAII	MAII
Arizona alum root	MAII	MAII
Mogollon hawkweed	MAII	MAII
Heartleaf groundsel	MAII	MAII
Maguire’s beardtongue	MAII	MAII
Davidson’s cliff carrot	MAII	MAII
Parish’s alkali grass	MAII	MAII

Blumer's dock	MAII	MAII
Arizona willow	MAII	MAII
Bebb's willow	MAII	MAII
Mogollon clover	MAII	MAII
MAII = May adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing.		

Rationale for Effect Determination to Sensitive Plants

ALTERNATIVE A

This alternative would not permit livestock on the allotments. Not permitting livestock on the allotments would reduce utilization of herbaceous and browse plant species by 15 to 30 percent or more, and provide more residual cover in the heaviest used riparian areas. The opportunity for recruitment of individuals into populations would be higher with the implementation of this alternative compared to any of the other alternatives proposed. The implementation of this alternative would provide the greatest opportunity for habitat improvement for all plants.

The primary benefit of this alternative is that recovery of range, soils, watershed and riparian conditions would be quicker than with any of the other alternatives.

Alternative B

Riparian (wetland/cienega and woody riparian vegetation types) -- Habitat for species needing these conditions (see table above) occur on the allotments in the form of wet meadows, springs, and small stretches along creeks. These areas occur only in small quantities across the allotment.

Management activities that may affect habitat includes overgrazing of high elevation riparian areas, modification to stream flow, and destruction of riparian shrubs. The grazing proposal has identified these riparian habitats as critical areas with intensive management (see proposed action).

The proposed actions give control of livestock grazing levels in riparian areas, using stubble heights as controls. Implementation of this intensive management will reduce potential direct and indirect conflicts between livestock and the riparian rare plant species by limiting or eliminating if fenced cattle grazing and trampling, maintaining vegetation cover. Direct disturbance could still occur as a result of elk or livestock grazing in the habitat, or unauthorized off-road vehicle entry.

The proposal complies with all Forest Plan S&G and objectives. The proposal would result in a neutral effect to the riparian species (Greene milkweed, villous groundcover milkvetch, White Mountains paintbrush, Gila thistle, heartleaf groundsel, Arizona willow, Bebb's willow and Mogollon clover) and not lead to trends toward federal listing.

Pinyon-Juniper Woodland – This vegetation type occurs on all Greens Peak and Cerro Trigo allotments, but not Hall allotment. This is an upland type, and in general receives less concentrated grazing and trampling from cattle than riparian or grassland areas.

The proposed actions give control of livestock grazing levels.

The proposed action should result in improved conditions compared to the existing grazing. The proposal complies with all Forest Plan S&G and objectives. The proposal would result in a neutral effect to the woodland species (yellow lady's slipper orchid, heathleaf wild buckwheat, Arizona sneezeweed, Arizona sunflower, Eastwood alumroot, Arizona alumroot, and Blumer's dock) and not lead to trends toward federal listing.

Conifer Forests – One or more of these vegetation types occur on all three grazing allotments. These are upland types, and in general receive less concentrated grazing and trampling from cattle than riparian or grassland areas. The proposed actions give control of livestock grazing levels. The forage utilization levels established to provide for MSO and Goshawk prey base is intended to help maintain habitat.

The proposal complies with all Forest Plan S&G and objectives and would result in a neutral effect to the Forest species (heathleaf wild buckwheat, Wislizeni gentian, Arizona sneezeweed, Eastwood alumroot, Arizona alumroot, Mogollon hawkweed, Maguire's beardtongue, Davidson's cliff carrot, Parish's alkali grass and Bebb's willow) and not lead to trends toward federal listing.

Grasslands – Cerro Trigo allotment has some Great Basin grassland, though invaded by juniper trees. Greens Peak and Hall allotments contain montane grassland. Grasslands are a preferred vegetation type for cattle, and receive occupancy and grazing intermediate between riparian areas and forests. The proposed actions give control of livestock grazing levels.

The proposal complies with all Forest Plan S&G and objectives and would result in a neutral effect to the Grassland species (Arizona sneezeweed, Arizona sunflower, yellow lady's slipper orchid, Arizona alumroot, and Maguire's beardtongue) and not lead to trends toward federal listing.

Migratory Birds

On January 10, 2001, President Clinton signed Executive Order 13186 placing emphasis on conservation of migratory birds.

No FS Regional or Forest policies have been developed to provide guidance on how to incorporate migratory birds into NEPA analysis. Advice from the Regional Office is to analyze effects in the following manner: (1) effects to Species of Concern listed by Partners in Flight; (2) effects to Important Bird Areas (IBAs); (3) Restoration/Enhancement/Mitigation; (4) Snag Retention; (5) Disclosure of Effects; (6) Monitoring.

Species of Concern

Arizona State Partners in Flight lists priority species of concern by vegetation type. I reviewed all species of concern for vegetation types found in this project area including potential trailing from summer allotments (Aspen, Ponderosa Pine, Grassland, Mixed Conifer, High Elevation Riparian, and Pinyon-Juniper). Table 15 displays the species that may occur in or near the project area.

Table 15. Migratory Birds that may be present in the project area.

Veg type	Species	Habitat	Habitat Impacts	Disturbance Effects
Mixed conifer, ponderosa pine, ponderosa pine/gambel oak	Northern goshawk	See TES write-up	See TES write-up	See TES write-up
Mixed conifer, ponderosa pine/gambel oak	Mexican spotted owl	See TES write-up	See TES write-up	See TES write-up
Mixed conifer, ponderosa pine, spruce-fir, aspen, pinyon-juniper, oak woodlands	Flammulated Owl	Prefers ponderosa pine forests with some undergrowth of oaks.	Overstory vegetation will not be altered. Trampling, compaction, and light grazing could affect insects. Impacts are expected to be minimal as a result established and monitored utilization levels.	Short term disturbance associated with concentrated livestock during trailing possible. Distributed livestock grazing proposed on allotments will have no measurable adverse effects.
Mixed conifer, ponderosa pine, pinyon-juniper, oak woodlands	Lewis's Woodpecker	Open country with scattered trees, attracted to burned over areas of Douglas-fir, pinyon-juniper, riparian and oak woodlands.	There will be no loss of snag habitat resulting from implementation of any alternative proposed for this project, so habitat suitability will not be affected for this species.	Short term disturbance associated with concentrated livestock trailing possible. Distributed livestock grazing proposed on allotments will have no measurable adverse effects.
Mixed conifer, ponderosa pine, pinyon-juniper, oak woodlands	Peregrine Falcon	See TES write-up	See TES write-up	See TES write-up
Mixed conifer, ponderosa pine, pinyon-juniper, oak woodlands	Golden Eagle	Open country from barren areas to coniferous forests, needs large trees and cliffs for roosting and perching	Suitable cliff and isolated large tree habitat present. Grazing proposed and trailing will not alter these features and provide for prey base.	Short term disturbance associated with trailing possible. Grazing proposed on allotments will have no measurable adverse effects.
Douglas fir, ponderosa pine	Olive sided flycatcher	Forest openings and edges-needs mature pines and	Overstory vegetation will not be altered. Trampling, compaction, and light grazing could affect insects. Conservative grazing	Short term disturbance associated with trailing possible. No adverse effects expected from distributed livestock

		snags.	utilization levels are expected to maintain habitat conditions.	grazing.
Douglas fir, ponderosa pine, spruce-fir, aspen	Williamson's Sapsucker	Uses different tree species for cavity nests	There will be no loss of snag habitat resulting from implementation of any alternative proposed for this project, so habitat suitability will not be affected for this species.	Short term disturbance associated with concentrated livestock trailing possible. No adverse effects expected from distributed livestock grazing.
Ponderosa pine, Douglas fir, maple, oak, aspen	Cordilleran Flycatcher	Dense canopy, mid-late succession forests, snags.	Saplings and larger trees will not be altered by grazing and trailing. Trampling, compaction, and light grazing could affect insects while trailing. Proposed livestock grazing on allotments are expected to be minimal as a result of conservative utilization levels.	Short term disturbance associated with concentrated livestock while trailing possible. No adverse effects expected during distributed grazing on allotment.
Ponderosa pine	Purple Martin	Large snags in or near open areas.	There will be no loss of snag habitat resulting from implementation of any alternative proposed for this project, so habitat suitability will not be affected for this species.	Short term disturbance associated with trailing possible. No adverse effects expected from distributed livestock grazing on allotments.
Ponderosa pine, and oak woodlands	Grace's Warbler	Pine-oak forests	Saplings and larger trees will not be altered by conservative grazing utilization levels proposed.	Short term disturbance associated with trailing possible. Distributed livestock will have no adverse effects.
Ponderosa pine, pinyon-juniper, spruce-fir	Virginia's Warbler	Ponderosa pine with scrubby brush interspersed with pinyon juniper	Overstory vegetation will not be altered. Shrub component may receive light browsing in some areas. Conservative utilization levels and monitoring will minimize adverse impacts.	Short term disturbance associated with trailing possible. Distributed livestock Grazing proposed will have no adverse effects.
Grassland	Short-eared owl	Open fields, meadows, pastures, canyons, with an abundant of rodents	Potential habitat present, conservative utilization levels proposed will provide for prey base habitat.	Short term disturbance associated with trailing possible. Distributed livestock grazing proposed will have no measurable adverse effects.
Grassland	Ferruginous hawk	Wintering, forage on prairie dogs, rabbits	Marginal habitat present. No large population of burrowing rodents present.	Short term disturbance associated with trailing possible. Distributed livestock grazing proposed will have no measurable adverse effects.

Grassland	Prairie Falcon	Open treeless terrain with cliffs for nesting	No Suitable cliff habitat present.	Short term disturbance associated with trailing possible. Grazing on allotments in will have no measurable adverse effects.
Grassland	Swainson's hawk	Migrating- found during shorter period of time, more dependant on insects, and smaller prey than ferruginous.	Marginal habitat present. Impacts are expected to be minimal and short term and integrity of habitat will be maintained.	Short term disturbance associated with trailing possible. Grazing proposed will have no measurable adverse effects.
Grassland	Burrowing owl	Limited to areas w/ burrowing mammals	No prairie dog towns or large population of burrowing rodents present.	No adverse affects expected.
Grassland	Grasshopper sparrow	Breeding diet of grasshoppers and insects, winter diet grass seeds	Conservative utilization levels proposed will provide for prey habitat.	No adverse affects expected
High Elevation Riparian	Common black-hawk	Large tall trees along perennial stream.	No grazing or trailing will not occur in common black-hawk habitat.	No adverse effects expected.
High Elevation Riparian	Southwestern willow flycatcher	See TES write-up	See TES write-up	See TES write-up
High Elevation Riparian	MacGillivray's warbler	Mesic/marshy willow thickets, wet meadow edge, nests under shrubs, needs dense understory	Overstory vegetation will not be altered. Shrub component may receive light browsing. Impacts are expected to be minimal and short term as a result of conservative utilization levels.	Short term disturbance associated with trailing possible. No adverse effects expected as a result of distributed livestock grazing.
High Elevation Riparian	Red-faced warbler	Maple, oak, sycamore, willow; dense mid-story, Steep, sloping canyons, ground nester	Overstory vegetation will not be altered. The trailing of livestock does not occur on steep slopes.	No adverse effects expected.

Pinyon-Juniper	Gray Flycatcher	Pinyon pine, juniper with open ponderosa overstory	Overstory vegetation will not be altered. Trampling, compaction, and light grazing could affect insects. Proposed grazing will provide for habitat needs.	Short term disturbance associated with trailing and grazing possible. No adverse effects expected.
Pinyon-Juniper	Pinyon-Jay	Pinyon juniper and ponderosa pine; need extensive stands for foraging.	Overstory vegetation will not be altered. Grazing will not affect food source.	Short term disturbance associated with trailing and proposed grazing possible. No adverse effects expected.
Pinyon-Juniper	Gray Vireo	Dense pinyon-juniper stands on moderate to steep slopes.	Overstory vegetation will not be altered. Trampling, compaction, and light grazing could affect insects. Proposed grazing will provide for habitat needs.	Short term disturbance associated with trailing and proposed grazing possible. No adverse effects expected.
Pinyon-Juniper	Black-throated Gray Warbler	Mid to late pinyon woodland with shrubby openings; not found where juniper becomes dominant	Saplings and larger trees will not be altered by grazing. Trampling, compaction, and light grazing could affect insects. Proposed grazing will provide for habitat needs.	Short term disturbance associated with trailing and proposed grazing possible. No adverse effects expected.
Pinyon-Juniper	Juniper Titmouse	Late successional tall pinyon-juniper woodlands; uses riparian habitat adjacent to pj.	Overstory vegetation will not be altered. Shrub component may receive light browsing in some areas. Impacts are expected to be minimal and short term.	Short term disturbance associated with trailing and proposed grazing possible. Conservative utilization levels of riparian habitat will provide for habitat needs. No adverse effects expected.
Spruce-Fir	Pine Grosbeak	Open/disturbed areas near forests. Upper canopy using high cone producing trees.	Overstory vegetation will not be altered. Trailing will not affect food source.	No adverse effects expected.
Aspen	Red-naped Sapsucker	Mature live aspen stands big enough to provide cavities; uses riparian areas of alder and willow to forage.	There will be no loss of snag habitat resulting from implementation of any alternative proposed for this project including trailing, so habitat suitability will not be affected for this species.	No adverse effects expected.

Important Bird Areas

Important Bird Areas (IBAs) are listed on the Audubon Society's website. There are no identified or potential IBAs on the three allotments or the sheep driveway. Therefore, no IBAs will be affected by the project.

Environmental Consequences

Alternative 1 – No Grazing

This alternative would not permit livestock on the allotments. Not permitting livestock on the allotments would reduce utilization of herbaceous and browse plant species by 15 to 30 percent or more, reduce the amount of large ungulate trampling, and provide more residual cover in the heaviest used riparian areas. The opportunity for recruitment of individuals into populations would be higher with the implementation of this alternative compared to any of the other alternatives proposed. The implementation of this alternative would provide the greatest opportunity for habitat improvement for all plants.

The primary benefit of this alternative is that recovery of range, soils, watershed and riparian conditions would be quicker than with any of the other alternatives.

Under alternative 1 there would be no adverse impact to migratory birds or their habitat because livestock would not be grazed.

Alternative 2 – Modified Proposed Action

The proposed action would allow for livestock grazing as described in the proposed action for the three allotments. A key element in the proposed actions will provide for grass cover along riparian habitat by establishing stubble height standards which would maintain prey base habitat. The livestock forage utilization levels proposed in the uplands are also intended to provide for prey base habitat so indirect impacts are expected to be minimized. Habitat quality for migratory birds is expected to be maintained or improved on the allotments as a result of conservative forage utilization levels and proper stocking levels.

MANAGEMENT INDICATOR SPECIES (MIS)

Forest Level Analysis

The Land and Resource Management Plan for the Apache-Sitgreaves National Forests (Forest Plan), adopted in 1987, and subsequently through 6 separate amendments, identified 17 Management Indicator Species (MIS), with species varying by Management Analysis area. Amendment 5 resulted in substantial changes in the original Monitoring Plan (Chapter 5) of the Forest Plan. The Apache-Sitgreaves National Forests 2006 Management Indicator Species Assessment was used as a reference for habitat/population trends and is available in the project record.

In order to estimate the effects of management activities on fish and wildlife populations, certain vertebrates and/or invertebrate species present in the area shall be identified and selected as management indicator species. These species will be selected because their population trends are believed to indicate the effect of management activities on specific capability area types. The

following table displays the Forest MIS, associated management areas, and habitat succession indicator.

All Forest MIS were reviewed in the Greens Peak, Hall, Cerro Trigo Allotments livestock grazing analysis to determine the appropriate MIS to be analyzed at the project level. If any MIS habitat occurred on the allotment the species was included in the project level analysis. Where no habitat exists, these MIS were excluded from detailed analysis. Tables 15 and 16 display all MIS designated on the forests and MIS analyzed in detail for the Greens Peak, Hall, Cerro Trigo Allotments project level analysis.

In May 2012, new MIS information became available in the DRAFT Assessment of Management Indicator Species Apache-Sitgreaves National Forests from 2005/2006 to 2011 prepared by the Arizona Game and Fish Department (AGFD, 2012). From this report, an addendum to the Wildlife and Fisheries Specialists report was prepared which includes an analysis of MIS using the AGFD 2012 information (available in the project record). The new information is incorporated into this MIS section.

Table 15. Forest Plan Management Indicator Species and Associated Management Areas.

Species Common Name	Water	Forested (MA1)	Woodland (MA2)	Riparian (MA3)	Grassland (MA4)	Habitat Succession Indicator
Abert Squirrel		X				Early
Elk		X	X		X	Early
Aquatic Macroinvertebrate				X		
Mule Deer		X	X			Early
Antelope			X		X	Early
Northern Goshawk		X				Late
Pygmy Nuthatch		X				Late
Turkey		X				Late
Red Squirrel		X				Late
Mexican Spotted Owl		X				Late
Yellow-Bellied Sapsucker		X				Snags
Plain Titmouse			X			Snags
Hairy Woodpecker		X				Snags
Lincoln's Sparrow				X		High Riparian
Lucy's Warbler				X		Low Riparian
Yellow-Breasted Chat				X		Low Riparian
Cinnamon Teal	X					Wetlands

Project Level Analysis

**Note: The following table represents acres on the new allotment configuration on Hall and Cerro Trigo Allotments.*

Table 16. MIS Selected for Project Level Analysis and Forest Population and Habitat Trends.

MIS Species by Forest Management Area	Habitat Component Indicated	Forest-wide Habitat Trend	Forest-wide Population Trend	Acres of Habitat Forest-wide	Acres to be analyzed in Project Area
Hairy Woodpecker	Snags (all types)	Upward	Stable	712,366	24,476
Red-naped sapsucker	Snags (Aspen)	Stable	Stable	800,000	1,175
Northern Goshawk	Late Succession (PP)	Stable to Declining	Declining	1,682,492	24,476
Merriam's Turkey	Late Succession	Stable	Stable	936,663	24,476
Pygmy Nuthatch	Late Succession (PP)	Declining	Stable	569,890	24,476
Mexican Spotted Owl	Late Succession	Declining	Declining	649,069	24,476
Rocky Mountain Elk	Early Succession	Increasing	Stable to Declining	1,690,439	25,305
Mule Deer	Early Succession	Increasing	Stable to Increasing	1,769,299	25,305
Abert's Squirrel	Early Succession (ponderosa pine)	Stable to Declining	Stable	746,902	24,476
Red Squirrel	Late Succession (spruce/mixed conifer)	Declining	Stable to Declining	203,347	24,476
Juniper (Plain) Titmouse	Snags	Stable to Increasing	Stable	784,532	829
Pronghorn Antelope	Early Succession	Increasing	Stable	479,867	9516
Lincoln Sparrow	High Elevation Riparian	Stable	Stable	10,101	No habitat within project area. Will not be analyzed further.
Yellow-breasted Chat	Low Elevation Riparian	Stable	Stable	10,101	No habitat within project area. Will not be analyzed further.
Lucy's Warbler	Low	Stable	Stable	10,101	No habitat

	Elevation Riparian				within project area. Will not be analyzed further.
Cinnamon Teal	Wetlands	Stable to Declining	Stable to Declining	29,430	65

The following is additional information to highlight some of the specific Forest Plan requirements that are relevant to this grazing proposal. The complete list of Forest Plan Standards and Guidelines are located in the 2012 MIS Forest Assessment in the project record.

Mexican Spotted Owl

Potential MSO habitat exists on all the allotments. Hall and Cerro Trigo allotments have two small portions (6 and 28 acres) of established MSO PACs. Population trends for the project area are not known, but regional populations are stable. Forest-wide suitable habitat for MSO is declining due to large-scale wildfires such as the Wallow Fire of 2011. Given the considerable loss of forest vegetation due to recent large scale forest fires, MSO populations on the ASNFs will likely decline due to decreased habitat capability. Additional monitoring of MSO territories will provide accurate population trend data, however, the full fire effects will not be known for several years.

Although livestock grazing on the Allotments will not directly affect habitat structure for the MSO, grazing can affect prey base habitat. Forest Plan direction is to implement the guidelines established in the MSO Recovery Plan. Specifically, livestock management would allow for the quickest recovery of degraded riparian habitat and maintain good to excellent range conditions in key areas while accommodating the needs of the owl and its prey base.

Riparian habitats on the allotments consist of a few small springs and no significant stream system where MSO can be typically located. Although the small amount of riparian habitat is not typical MSO habitat, spring sources should be managed as emphasis areas. There are portions of two MSO PACs within the Greens Peak, Hall, And Cerro Trigo Allotment Management Plan Analysis Area. There are approximately 24,479 acres of late succession habitat within the Greens Peak, Hall, and Cerro Trigo Allotment Management Plan Analysis Area. This is approximately 3.8% of habitat forest-wide.

Northern Goshawk

Northern Goshawk habitat exists on all of the Allotments. Complete surveys of the allotments have not occurred, but suitable habitat exists. One goshawk PFA has been established on the Hall allotment.

Although livestock grazing on the allotments will not directly affect habitat structure for the Northern Goshawk, grazing can affect prey base habitat. Forest Plan direction is to implement the guidelines established in the Northern Goshawk Management Recommendation RM-217, which requires grazing actions to provide for prey base habitat.

The Greens Peak, Hall, and Cerro Trigo allotments contain 24,476 acres of late succession ponderosa pine habitat. This is approximately 1.5% of the habitat available forest-wide for Northern Goshawk.

Big Game Indicator Species (Elk, Deer, Antelope)

The allotments provides summer and winter range habitat for big game MIS species. The Forest Plan direction is to provide for the forage needs and hiding cover for wildlife species. An important direction related to turkey habitat is Northern Goshawk Management Recommendation RM-217.

Population estimates and associated herbaceous forage needs of wild ungulates are determined for each grazing allotment through a series of analyses. The AGFD maps landscape seasonal distributions and densities for each species, based on surveys, hunt information, population models, and professional judgment. The Forest Service extrapolates these densities for each allotment by overlaying these maps on allotment boundaries, and calculating wild ungulate populations. Total forage needs (herbaceous and browse combined) for each species of wild ungulates are determined, and the need for herbaceous forage is calculated for each species based on a percentage of total forage needs met by browse. See Range Specialist Report for specific forage allocations.

Elk

The Allotments consist of high elevation (9,000ft) open grassland to transition pinyon-juniper woodland at an elevation of 7,600 ft. Both elk summer and winter range is located on the allotments. During winters of heavy snow cover, elk densities on the lower elevation of the winter range can increase. The increased concentration of elk on the winter range is attributed to two factors; 1) the amount of winter range is limited and 2) non-resident elk from the White Mountain Apache Reservation migrate to the winter range on the Forest and adjacent State and private land.

During summer, elk generally forage in large open meadows, riparian areas, and cienegas throughout the higher elevations of the allotments. Elk require cooling thermal cover in conjunction with adequate hiding cover. As elk move to the northeastern portion of the allotments in winter, they generally inhabit the ponderosa pine and pinyon-juniper transition areas. A significant amount of elk winter range is found on the adjacent State and private land.

Forage monitoring conducted prior to livestock entry indicates that elk will utilize cool-season grasses, forbs, and shrubs when spring green-up occurs, particularly selecting for forage in riparian zones and meadows. Browse species are not abundant at the higher elevations but is an important component in the transition habitat. This pre-cattle forage use is attributed to resident and non-resident wintering elk from the White Mountain Apache Reservation, as the wintering elk migrate back onto spring and summer range.

Over the last 5 years (2006-2011) Rocky Mountain elk populations on the Apache-Sitgreaves National Forest have either been relatively stable or declining. Wildfire activity over the past decade will likely improve habitat conditions by creating early successional habitats that benefit browse production. Although large scale high intensity fires, such as the Wallow Fire in 2011 that burned over 540,000 acres, may not result in the landscape heterogeneity required to support robust Rocky Mountain elk populations in the short-term, natural succession combined with active forest restoration designed to create a mosaic of uneven-aged stands will ultimately benefit the resident Rocky Mountain elk populations. Rocky Mountain elk populations on the Apache-Sitgreaves National Forest are in good condition with a stable population growth trend.

There are approximately 25,305 acres of habitat for Rocky Mountain elk within the Greens Peak, Hall, And Cerro Trigo Allotment Management Plan Analysis Area. This is approximately 1.5% of habitat for this species forest-wide.

Mule Deer

Mule deer summer in the ponderosa pine and mixed conifer vegetation types on the allotments. In the fall, they migrate north to lower elevations on the allotments to wintering areas associated with the ponderosa pine transition zone.

Mule deer populations across the Forests have declined over the past decade, primarily due to natural processes. An overall decrease of the browse component, which affects the forage base for mule deer, is a result of increasing forest canopy cover and associated fire suppression. In addition, winter elk concentrations also contribute to the decreased browse availability for use by mule deer. Lower fawn survival is attributed to increased predation.

Overall climate patterns, including a long-term dry period has impacted mule deer populations throughout the western United States (McCulloch and Smith 1991). Deer densities on the Allotments are considered low. The AGFD management strategy for mule deer is to assist in population recovery where possible.

It is expected that mule deer populations on the Allotments will not increase substantially in the future without direct habitat enhancement, reduction in hunting pressure, and decrease in competition with other ungulates.

The main factor influencing the low winter habitat quality is the dense canopy cover resulting from fire suppression. However, as a result of timber treatment intended to protect the urban interface from catastrophic fire, thousands of acres have been treated adjacent to the allotments in a way that improves deer habitat by reducing the overstory.

The Apache-Sitgreaves National Forest encompasses seven Game Management Units (GMUs) managed by the Arizona Game and Fish Department. The Arizona Game and Fish Department has provided aerial survey data for mule deer collected between 2001 and 2011 for four GMUs. In unit 27, for example, the mule deer population appears to be high with annual population estimates averaging 6,562 deer during this time period and a range of 6,108 to 7,169. In contrast, the combined population estimates for units 3A and 3C suggest that while relative low, the mule deer population is increasing and has been increasing over the past decade. Population estimates for Unit 1 show considerable fluctuation ranging from 1,053 to 1,278 over the past decade. In summary, over the last 5 years (2006-2011) mule deer populations on the Apache-Sitgreaves National Forest have either been relatively stable (GMU 27) or increasing (GMU 3A, 3C, and 27).

There are approximately 25,305 acres of habitat for mule deer within the Greens Peak, Hall, and Cerro Trigo Allotment Management Plan Analysis Area. This is approximately 1.4% of the habitat for this species forest-wide.

Antelope

Pronghorn Antelope are found across the grasslands of the District, with populations occurring seasonally in the higher elevation bunch grass communities and year-round in the lower elevation blue-grama dominated grasslands. The Hall and Greens Peak Allotments provide high elevation summer grassland and lower elevation habitat for antelope. The Cerro Trigo Allotment provides lower elevation winter and summer habitat.

The AGFD estimate the total Unit 1 antelope population at approximately 1,000 animals. Historical survey data indicates that on average 25% of antelope surveyed are found in the higher elevation habitat and 75% are located in the lower elevation. Although population densities are

greater at the lower elevations, fawn/doe ratios average 10 fawns per 100 does greater in the high elevation grasslands. This suggests the high elevation grasslands are important for producing young.

Population levels in the high elevation habitat have remained stable or slightly increased. However, doe/fawn ratios have decreased since 1999. In an attempt to understand why a slight downward trend was occurring the District looked at the potential impacts livestock could be having during the fawning period (before July 21). The livestock on- dates of the high elevation habitat on the District were reviewed over the last 11 years. On average no more than 40% of the high elevation grassland important for antelope habitat was being entered by livestock before July 21, or 60% of the habitat was available to antelope for fawning without potential livestock disturbance impacts.

The later on dates proposed on the allotments further reduce potential impacts. No pattern or relationship could be attributed between livestock use during and before July 21 and the lower doe/fawn trend. However, a relationship could be established between drought years and lower doe/fawn ratios. The District will continue to minimize the impacts to fawning habitat by scheduling livestock entry dates after July 21 whenever possible.

The primary concern for antelope as related to grazing is the residual forage remaining after the growing season, which is important for hiding cover, competition for forage, and potential disturbance during the fawning period. The most significant factors affecting antelope populations include habitat conditions related to drought, predation, and hunt structures established by the AGFD.

Over the last 5 years (2006-2011) pronghorn populations on the Apache-Sitgreaves National Forest have been relatively stable. Wildfire activity over the past decade will likely improve habitat conditions by creating early successional habitats that benefit grazing production. The large scale high intensity fires, such as the Wallow Fire in 2011 that burned over 490,000 acres, will likely provide an exponential increase in early successional habitats that will favor pronghorn population growth. However, juniper encroachment continues to be a leading cause of habitat loss throughout the ASNF.

There are approximately 9,516 acres of habitat for pronghorn antelope within the Greens Peak, Hall, and Cerro Trigo Allotment Management Plan Analysis Area. This is approximately 2.0% of the habitat for this species forest-wide.

Turkey

Merriam's Turkey occur throughout the area, however, turkeys tend to concentrate along the draws and canyons on the Allotments. Feeding turkeys seek out small forest openings typically surrounded by structurally diverse areas that provide adequate cover from predators. Turkeys require nesting sites characterized by steep slopes, typically in canyons, which have shrubs and high overhead and horizontal cover. Turkeys roost selectively in dense stands of large conifer trees (mainly ponderosa pine), often in association with drainages and riparian habitat.

The turkey population in GMU 1 appears to be stable, but short-term reproductive success and survivability of adults is influenced by weather patterns. Riparian habitat on the allotments is an important habitat component for turkeys that can be affected by grazing. Riparian areas and associated vegetation species provides significant sources for herbaceous seed heads and insects, both necessary food sources. Grazing utilization standards for riparian habitats are intended to assist in maintaining habitat requirements for turkeys. The most significant factors affecting turkey populations include habitat conditions, weather, and hunt structures established by the AGFD.

Taking into account the continuing occurrence of the turkey across the Forest in suitable habitat, the abundance and wide distribution of suitable habitats across the Forest, stable habitat trends for late succession habitat in the Forest, and the presence of a harvestable surplus in the turkey population, it appears that the Forest supports a well distributed reproducing population of this species. Currently, outside of the areas impacted by the 2011 Wallow Fire, turkey populations in the Apache-Sitgreaves National Forest are considered to be stable, and likely near potential. Harvest data obtained from the Arizona Game and Fish Departments for GMUs within the Apache-Sitgreaves National Forest suggests that turkey populations are stable.

The Greens Peak, Hall, And Cerro Trigo Allotment Management Plan Analysis Area contains approximately 24,476 acres of late succession habitat. This is approximately 2.6% of habitat for this species forest-wide.

Red and Abert's Squirrel, Pygmy Nuthatch, Plain Titmouse, Hairy Wood pecker, Cinnamon teal

Habitat for these species may be located on the allotments. Cinnamon teal habitat occurs at Carnaro Lake on Greens Peak allotment in the form of wetland habitat. Most of the Forest guidelines are associated with timber treatments and management. It is difficult to measure direct impacts to forest structure because it would be long term in nature. One of the most relevant Forest Plan guideline to provide for these species is Forest Plan direction is to implement the guidelines established in the Northern Goshawk Management Recommendation RM-217, which requires grazing actions to provide for prey base habitat.

Red Squirrels - Within the Greens Peak, Hall, and Cerro Trigo Allotment Management Plan Analysis Area, a total of 24,476 acres of late succession mixed conifer/spruce fir habitat occurs. This is approximately 12% of habitat for this species forest-wide.

Abert's Squirrels - The Greens Peak, Hall, And Cerro Trigo Allotment Management Plan Analysis Area contains approximately 24,479 acres of stratified ponderosa pine habitat, or approximately 3.3% of available habitat for Abert's squirrels forest-wide.

Pygmy Nuthatch – A total of 24,476 acres of potential habitat, or 4.3% of habitat forest-wide, exists in the Greens Peak, Hall, and Cerro Trigo Allotment Management Plan Analysis Area.

Plain Titmouse – There are approximately 829 acres of habitat for plain titmouse within the Greens Peak, Hall, and Cerro Trigo Allotment Management Plan Analysis Area. This is approximately 0.1% of the habitat for this species forest-wide.

Hairy Woodpecker – The Greens Peak, Hall, And Cerro Trigo Allotment Management Plan Analysis Area contains 24,476 acres of habitat with small inclusions of snag habitat, or approximately 3.4% of the habitat available forest-wide, for hairy woodpecker.

Cinnamon teal – There are approximately 65 acres of habitat for cinnamon teal within the Greens Peak, Hall, and Cerro Trigo Allotment Management Plan Analysis Area. This is approximately 0.2% of the habitat for this species forest-wide.

EFFECTS OF ALTERNATIVES TO MIS

ALTERNATIVE 1 – NO LIVESTOCK GRAZING

This alternative would not permit livestock on the allotments. Not permitting livestock on the allotments would reduce utilization of herbaceous and browse plant species significantly and provide more forage and cover for wildlife. The opportunity for recruitment of individuals into populations would be higher with the implementation of this alternative compared to any of the other alternatives proposed. The implementation of this alternative would provide the greatest

opportunity for habitat improvement for all plant and wildlife species. This alternative would be consistent with Forest Plan standard and guidelines and objectives related to wildlife.

The primary benefit of this alternative is that recovery of range, soils, watershed and riparian conditions would be quicker than with any of the other alternatives. Increases in ungrazed available herbaceous and browse forage would be expected to result in higher densities of insects, small mammals, passerine birds, game animals and other wildlife species that depend on grasses, forbs, leaders on woody shrubs and mast for food. Increases in these species populations would have beneficial effects on Management Indicator Species (MIS that use the allotment. More abundant food enhances the physiological condition of animals, which would provide an opportunity for higher birth or clutch rates and better survival of young. The survival rate of Northern Goshawk young, for example, has been shown to be significantly higher when prey is abundant and the time parent birds must be away from the nest to search for food is minimal (Dewey and Kennedy 1997). Voles, important in the diet of Mexican Spotted Owls, are known to be more abundant in meadows where grasses provide quality forage and cover (Ward and Block 1995).

Habitat for MIS would also improve under this alternative. Turkey populations depend on grasshoppers and other insects during the spring and summer and would likely experience higher survival rates if this alternative is implemented. Whitetail and mule deer would also benefit from the reduced competition for forage and improvements in cover for fawning, thermal regulation, and escape.

Small mammals and birds that rely on herbaceous ground cover would become more abundant as cover increases in amount and density. This could, in turn, increase predator populations as well.

With the removal of livestock, conditions in riparian areas would improve the quickest. Extant populations of willow would have the opportunity to increase in numbers and vigor, although grazing by elk could still be detrimental.

Because healthy and abundant riparian vegetation slows water flow, promotes lower water temperatures, and reduces sediments in the water, the habitat macroinvertebrates, would be improved. This alternative would have the greatest potential for restoration of the greatest number of riparian areas as compared to the other alternatives.

Increased ungrazed available herbaceous forage would also mean more litter for soil protection and enrichment. Over time, increased vigor and density of herbaceous ground cover with increased litter returns would reduce erosion and sediment delivered to streams and stock tanks, thus reducing the need to accomplish periodic stock tank cleaning. This would be expected to increase abundance and diversity of aquatic macroinvertebrates.

Under this alternative, new range developments would not be constructed and maintenance on existing developments would generally be eliminated, unless the District elects to assume the responsibility. Unmaintained fences, unless assigned to adjacent permittees as appropriate, would be a hazard to deer, elk, and antelope. Water developments may become defunct, however, water is often not limiting for far ranging wildlife species. In addition, small mammals and macroinvertebrates often do better at water sites that are not developed and/or periodically maintained with ground disturbing activities.

Of the two proposed alternatives, the selection and implementation of this alternative would best meet the short (one to three years) and long term (10+ years) needs of the greatest number of wildlife populations in the action area (Allotments and adjacent allotments). There would not be any expected direct, indirect or additional cumulative adverse effects to wildlife populations or their habitat because livestock are not permitted. Directly and/or indirectly, all MIS species would benefit the most by the selection and implementation of this alternative because of predicted

improvements in their habitat capability, increased prey species habitat capability. Implementation of this alternative would result in a positive effect for each MIS species. This could improve habitat trend within the project area, but would not affect Forest-wide population trend. This alternative would be consistent with wildlife Forest Plan standard/guides. In general, benefits would occur as follows:

- 1) watershed, riparian, range, and soil conditions would have the greatest opportunity for achieving and maintaining ecological potential;
- 2) increased diversity, abundance and distribution of native herbaceous and woody plant species used by MIS for a) foraging, b) nesting, c) roosting, d) denning, e) brood rearing, f) travel, and g) hiding and loafing cover;
- 3) increased diversity, abundance, and distribution of insect species, due to expected improvements in native plant species composition and distribution, that would be prey species for some MIS;
- 4) increased diversity, abundance, and distribution of MIS.

ALTERNATIVE 2

Greens Peak Allotment

Grassland MIS

Pronghorn Antelope - Direct impacts to antelope can occur from disturbance resulting from livestock operations such as grazing and management actions such as herding livestock. These direct disturbances can result in negative effects by altering feeding and fawning behavior. It has been determined by the Arizona Game and Fish Department the most sensitive period for fawning is completed by July 21. The proposed on date of June 1-15 is approximately one month into the sensitive period which could be detrimental. This potential disturbance would be mitigated by proposed deferred grazing which would allow rest to approximately 50% of the grassland habitat.

At the District scale it was determined that 60% of the habitat will be rested during this sensitive time. Overutilization of forage by livestock can result in indirect negative impacts by competing for the same forage base and reducing grassland cover. Although antelope will select to graze forbs over grass a potential for conflict could occur. This potential conflict will be reduced because forage allocations to wildlife needs were provided first then any surplus forage was allocated to livestock. If a grassland pasture is grazed late in the season it may not provide enough residual forage for hiding cover the next year which is detrimental during fawning. Because of deferred grazing not all pastures will be grazed late season which will allow some pastures with early season residual cover. The proposal complies with all Forest Plan S&G and objectives.

Although proposed grazing will improve conditions compared to the existing grazing system, this alternative would result in a neutral effect to antelope and not affect the Forest-wide habitat and population trend.

Forest MIS

Deer, Elk and Turkey – Summer and winter range habitat exists on all allotments for these species. Direct impacts associated from disturbance can occur as a result of livestock management activities. This disturbance potential is expected to be minimal because of the dense forest cover

the allotment provides that livestock generally do not enter. Livestock prefer the open grassland.

Wildlife livestock competition for forage can result in negative effects. This potential conflict will be reduced by the later livestock on-date, deferred livestock grazing, and the fact that forage for wildlife was allocated first and surplus forage was then allocated to livestock.

The management emphasis to improve riparian habitat would provide additional benefits to turkey when poults hatch. Population trends for these species will still be primarily determined by hunt structures established by the Game and Fish Department. The proposed grazing will maintain and potentially improve habitat conditions from current management.

The proposal complies with all Forest Plan S&G and objectives and would result in a neutral effect to turkey, deer and elk and not affect the Forest-wide habitat and population trend.

Northern Goshawk and Spotted Owl- There is no known occupied MSO habitat on the allotment but potential habitat does exist. There is one known nesting area for Northern Goshawk on the allotment.

Direct disturbance from livestock and livestock management activities are expected to be discountable because livestock generally do not forage in the dense forested stands.

Overgrazing by livestock can have a negative effect to prey base species. Implementation of the riparian emphasis management objectives and the Goshawk guidelines represented in the forage utilization levels will provide for prey base habitat.

The proposed grazing will maintain and potentially improve habitat conditions from current management.

The proposal complies with all Forest Plan S&G and objectives and would result in a neutral effect for Goshawk and Spotted Owl and not affect the Forest-wide habitat and population trend.

Abert Squirrel and Red Squirrel- The habitat and species occurs on all allotments. The most significant management activities that can affect these species and habitat is logging.

Over a long period of time livestock grazing could affect forest structure but measuring that change over time would be very difficult. Livestock grazing has occurred on the Forest for over 100 years and forest structure important to squirrels has been maintained.

Livestock disturbance impacts are expected to be discountable because livestock do not generally graze in timbered stands.

The implementation of the forage utilization levels intended to provide for MSO and Goshawk prey base will maintain squirrel habitat.

Proposed grazing will maintain and potentially improve habitat condition from current management. The proposal complies with all Forest Plan S&G and objectives and would result in a neutral effect to Aberts and red squirrel and will not affect Forest-wide habitat and population trends.

Pygmy Nuthatch, Yellow-Bellied Sapsucker, Hairy Woodpecker - Habitat and species likely occur on the allotment. Management activities identified that may affect these species are related

to timber harvest and fuelwood gathering, although grazing could possibly affect forest structure over time. It would be very difficult to measure this potential impact to these species.

Grazing has occurred on the forest for over 100 years and habitat conditions for these species have been maintained. Livestock disturbance impacts are expected to be discountable because livestock do not generally graze in timbered stands. There is no dietary conflict between these species and livestock.

The implementation of the forage utilization levels intended to provide for MSO and Goshawk prey base is intended to maintain habitat conditions.

The proposal complies with all Forest Plan S&G and objectives. The proposal would result in a neutral effect to Pygmy Nuthatch, Yellow-Billed Sapsucker, and Hairy Woodpecker and not affect the Forest-wide habitat and population trend.

Riparian MIS

Lincoln's sparrow - Habitat for this species could occur on the allotment in the form of wet meadows and springs. These springs and wet meadows occur only in small quantities across the allotment.

Management activities that may affect habitat includes; overgrazing of high elevation riparian areas, modification to stream flow and destruction of riparian shrubs. The grazing proposal has identified these riparian habitats as critical areas with intensive management (see proposed action).

Implementation of this intensive management will reduce potential direct and indirect conflicts between livestock and Lincoln's sparrow by maintaining cover and forage. Direct disturbance could still occur as a result livestock grazing in potential habitat.

The proposal complies with all Forest Plan S&G and objectives. The proposal would result in a neutral effect to Lincoln's sparrow and not affect the Forest-wide habitat and population trend.

Water MIS

Cinnamon Teal- Potential habitat for this species occurs on the allotment at Carnero Lake. Carnero Lake is a man made reservoir intended to store water for irrigation so water levels change depending on the needs of the water rights holder.

Management activities that may affect habitat includes; seasonal drought, draining of wetland, grazing of wetlands during nesting. The deferred grazing proposed would prevent direct livestock impacts to nesting waterfowl when that pasture is rested during the nesting period (late spring early summer). However trampling and disturbance by livestock could still occur at Carnero Lake when the pasture is grazed early in the season.

Most of the large wetland habitats on the District have been excluded from livestock to reduce potential impacts across the District. The proposed action should result in improved conditions compared to the existing grazing.

The proposal complies with all Forest Plan S&G and objectives. The proposal would result in a

neutral effect to Cinnamon teal and not affect the Forest-wide habitat and population trend.

Woodland MIS

Plain titmouse- Habitat for this species occurs on the northern portion of the allotments. Management activities that may affect habitat are related to timber harvest.

There is no dietary overlap and low probability of direct disturbance from livestock management.

The forage utilization levels established to provide for MSO and Goshawk prey base is intended to help maintain habitat.

The proposed action should result in improved conditions compared to the existing grazing. The proposal complies with all Forest Plan S&G and objectives. The proposal would result in a neutral effect to Plain titmouse and not affect the Forest-wide habitat and population trend.

Hall Allotment:

The grazing alternative has features that are expected to reduce impacts to wildlife habitats over the existing grazing system. The most significant of the changes that is expected to improve resource conditions is the division on the allotment which will allow for greater livestock control and more intensive management. Stocking levels would be based on meeting resource protection and meeting 100% of estimated wildlife forage needs. The wild ungulate populations were estimated and all forage needs were allocated. The forage and habitat needs of small mammals important as prey base were also allocated. The riparian emphasis management is expected to improve riparian habitat conditions.

Livestock entry dates will be based on range readiness but estimated to be June 15 thru the end of October. These planning dates better reflect when the range could be ready compared to the current early season entry date. The later on dates will help reduce wildlife/livestock forage competition in riparian habitat.

Grassland MIS

Pronghorn Antelope - The effects from implementation of Alternative 2 on pronghorn would be the same as described above for the Greens Peak Allotment.

Forest MIS

Deer, Elk and Turkey – The effects from implementation of Alternative 2 on deer, elk and turkey would be the same as described above for the Greens Peak Allotment.

Northern Goshawk and Spotted Owl- There is no known occupied Goshawk habitat on the allotment. There six acres of an Mexican Spotted Owl Protected Activity Center on the allotment. Potential habitat for both species does exist on the allotment.

Direct disturbance from livestock and livestock management activities is expected to be discountable because livestock generally do not forage in the dense forested stands.

Overgrazing by livestock can have a negative effect to prey base species. Implementation of the riparian emphasis management objectives and the Goshawk guidelines represented in the forage utilization levels will provide for prey base habitat.

The proposed grazing will maintain and potentially improve habitat conditions from current management. The proposal complies with all Forest Plan S&G and objectives and would result in a neutral effect for Goshawk and Spotted Owl and not affect the Forest-wide habitat and population trend.

Abert Squirrel and Red Squirrel- The effects from implementation of Alternative 2 on Aberts and red squirrels would be the same as described above for the Greens Peak Allotment.

Pygmy Nuthatch, Yellow-Bellied Sapsucker, Hairy Woodpecker- The effects from implementation of Alternative 2 on pygmy nuthatch, yellow-bellied sapsucker, and hairy woodpecker would be the same as described above for the Greens Peak Allotment

Riparian MIS

Lincoln's sparrow- The effects from implementation of Alternative 2 on Lincoln's sparrow would be the same as described above for the Greens Peak Allotment.

Cerro Trigo Allotment

Grassland MIS

Pronghorn Antelope - The effects from implementation of Alternative 2 on pronghorn would be the same as described above for the Greens Peak Allotment

Forested MIS

Deer, Elk and Turkey – The effects from implementation of Alternative 2 on deer, elk and turkey would be the same as described above for the Greens Peak Allotment

Northern Goshawk and Spotted Owl- There are two small portions (6 acres and 32 acres) of the Gillespie and Whiting Knoll MSO PACs and potential unoccupied MSO habitat on the allotment. No known Goshawk nesting sites occur however potential habitat does occur on the allotment.

Direct disturbance from livestock and livestock management activities are expected to be discountable because livestock generally do not forage in the dense forested stands where these species occur. Overgrazing by livestock can have a negative effect to prey base species. Implementation of the riparian emphasis management objectives and the Goshawk guidelines represented in the forage utilization levels will provide for prey base habitat.

The proposed grazing will maintain and potentially improve habitat conditions from current management. The proposal complies with all Forest Plan S&G and objectives and would result in a neutral effect for Goshawk and Spotted Owl and not affect the Forest-wide habitat and population trend.

Abert Squirrel and Red Squirrel- The effects from implementation of Alternative 2 on Abert's

squirrels and red squirrels would be the same as described above for the Greens Peak Allotment

Pygmy Nuthatch, Yellow-Bellied Sapsucker, Hairy Woodpecker- The effects from implementation of Alternative 2 on pygmy nuthatch, yellow-bellied sapsucker, and hairy woodpecker would be the same as described above for the Greens Peak Allotment

Riparian MIS

Lincoln's Sparrow- The effects from implementation of Alternative 2 on Lincoln's sparrows would be the same as described above for the Greens Peak Allotment

Woodland MIS

Plain Titmouse- The effects from implementation of Alternative 2 on plain titmouse would be the same as described above for the Greens Peak Allotment

Cumulative Effects

Cumulative effects consideration will include the three allotments analyzed in this document and the surrounding allotments. A temporal boundary of ten years will be used to try and capture the measurable changes in livestock management that have occurred across the District and Forest.

Under alternative 1, there would not be any expected direct, indirect or additional cumulative adverse effects to wildlife and plant populations because livestock are not permitted. Under alternative 2, cumulative effects to wildlife species can occur as a result of livestock grazing in the surrounding areas. Over the last 10 years the District has been working to complete grazing analysis and improve standards that reduce direct and indirect impacts to the wildlife resource across the District and Forest. To date approximately 80% of the allotments across the District have improved standards that improve riparian and upland habitat conditions. Potential conflicts during the critical early season grazing have been reduced. These larger scale improvements have resulted in improved habitat condition across the District and Forest. Cumulatively, livestock grazing on the allotments when considered with Wallow Fire effects would contribute negligible effects to terrestrial wildlife species, due to the location of the allotments outside the Wallow Fire burn perimeter.

Aquatic Wildlife Species

Area of Analysis

The action area for aquatic and semi-aquatic species of concern covered in this analysis includes Greens Peak, Hall and Cerro Trigo Allotments and all perennial habitats extending downstream from the allotments for up to 15 miles. The cumulative effects analysis area is the same location as described for the action area with a temporal timescale of 10 years.

Affected Environment

Existing Conditions

Green's Peak Allotment Threatened, Endangered and Sensitive Species

Threatened, Endangered or Sensitive fish, reptiles, amphibians, clams, snails, or insects documented on Hall Allotment or with potential or suitable habitat in the action area are listed below in Table 17. The action area primarily includes portions of three 5th HUC watersheds: Oso Draw, Big Hollow Wash and Carnero Creek -Little Colorado River Headwaters. Two other 5th HUC watersheds have 1300 and 1600 acres each, respectfully, in the action area: South Fork Little Colorado Headwaters and Upper North Fork White River. Species described below in Table 17 could occur on the District, but do not occur on the allotment. Those species that are present in the action area or that have potential or suitable habitat in the action area have further analysis.

Table 17. Aquatic Threatened (T), Endangered (E), Experimental, and Proposed Threatened (PT) or Proposed Endangered (PE) Species in Greens Peak Action Area

Common Name	Scientific	Status	Critical Habitat Designated?	Critical Habitat in GREENS PEAK?	Species Known to Occur Historically?	Species Known to Occur Currently?	Suitable or Potential Habitat in AA?
Little Colorado spinedace & critical habitat	<i>Lepidomeda vittata</i>	T	Yes	No Critical habitat not in AA. Closest critical habitat is over 18 linear miles from the allotment in Nutrioso Creek.	No Species not known to occur in the AA.	No. Closest downstream occurrence is approximately 17 miles from the allotment boundary off of the Forest in the Little Colorado River (LCR) via either the Carnero Creek or the Fish Creek drainage systems.	Yes. 7 miles of suitable or potential habitat occurs in the LCR, below the Fish Creek confluence to SH 261.
Apache trout	<i>Oncorhynchus apache</i>	T	No	No	Yes. Species stocked into Mineral Creek in the 1960's	Yes	Yes. 4 miles of occupied habitat in Mineral Creek, approx. 6.5 miles below allotment boundary. .
Loach minnow & proposed critical habitat	<i>Tiaroga cobitis</i>	T ¹	Proposed ¹	No Proposed critical habitat does not occur in action area. Closest occurrence is over 20 linear miles from the allotment In the Black River watershed.	No Species not found in the AA 5 th HUC watersheds	No No records of occurrence.	No Species not native to Little Colorado River drainages. Closest occurrence of species and proposed critical habitat is in the Upper Black River watershed, over 20 direct linear miles from the allotment.
Chiricahua leopard frog & proposed critical habitat	<i>Lithobates chiricahuensis</i>	T	Proposed	No. Proposed critical habitat does not occur in action area. Closest occurrence is over 20 linear miles from the allotment at Three Forks, Black River.	No No records of occurrence.	No. Closest occurrence is over 20 linear miles from the allotment at Three Forks, Black River.	Yes. Up to 10 miles of potential or suitable habitat in Mineral Creek, Fish Creek and Carnero Creek & up to 3 acres of stock tank habitat & 150 acres of reservoir habitat in Carnero Lake and Norton Reservoir.

¹On Oct. 28, 2010, the U.S. Fish and Wildlife Service proposed to change the status of loach minnow (*Tiaroga cobitis*) from threatened to endangered under the Endangered Species Act of 1973, as amended, and to designate critical habitat.

Little Colorado Spinedace

Although species is not present on the allotment or in the action area, potential or suitable habitat may occur.

Spinedace are found in water 0.5-4.3 ft deep, but appear most abundant in depths of about 1.9 ft. Spinedace are most common in slow-to-moderate water currents that flow over fine gravel bottoms but are known to occur in streams with a wide variety of substrates. They avoid deep, heavily shaded pools and shallow, open areas, preferring unshaded pools with rocks or undercut banks for cover. Temperatures where populations exist generally range from 58-79° F. Young of the year are most abundant on uniformly turbulent riffles 3.9-9.8 in. deep. Spinedace appear quite capable of tolerating relatively harsh environments that undergo dramatic fluctuations in pH, dissolved gases, turbidities, and water temperatures. Their populations are believed to be declining due to alteration of habitat through reduced streamflow and predation and/or competition with non-native fishes. Predation occurs mainly from rainbow trout and green sunfish (U.S. Forest Service 2004).

In their 5-year status review, U.S. Fish and Wildlife (2008) indicates that it is unclear whether occupancy of these widely varying habitats reflects the local preferences of the species or its ability to tolerate less-than-optimal conditions. Both higher gradient mountain streams and lower-gradient valley streams and rivers have provided habitat for the spinedace. Residual pools and spring areas are important refuges during periods of normal low water or drought. It has been noted that historically, spinedace have been able to recolonize other stream reaches during wetter periods from these refugial areas. Based on the 5 Year review by U.S. Fish and Wildlife Service, Little Colorado spinedace is recommended for reclassifying to Endangered status primarily due to dewatering of habitat and interactions with non-native fish and crayfish.

Species does not occur in the action area. Closest downstream occurrence is approximately 17 miles from the allotment boundary off of the Forest in the LCR via either the Carnero Creek or the Fish Creek drainage systems. There is no critical habitat in the action area. Suitable or potential habitat does occur in the LCR for approximately 7 miles.

Apache Trout

Species is not present on the allotment but does occur in the action area.

Apache trout are thought to have historically occupied headwaters of the Salt, San Francisco, and Little Colorado rivers, although currently restricted to headwater streams of the Salt (Black and White Rivers), Little Colorado, and Blue Rivers in the White Mountains of eastern-central, Arizona. On the Apache-Sitgreaves National Forests, several occupied streams occur in all of the watersheds described above. The present distribution of Apache trout recovery populations occur in 28 populations within its historical range in approximately 199 km (119 mi) of stream (U.S. Fish and Wildlife Service 2009) .

Apache trout prefer cool, clear, high-elevation streams and rivers, although they may have historically ranged down into larger streams. Large individual trout live in pools, while smaller ones prefer cover and structure such as overhanging trees or brush in runs and riffles (AGFD 2002).

Apache trout generally require water temperatures below 25° C (77°F). Adequate stream flow and shading are generally required to prevent lethal temperatures and ample stream flow helps maintain pools that are used frequently during periods of drought and temperature extremes (U.S. Fish and Wildlife Service 2009). Apache trout require clean coarse gravel substrates for spawning. Apache trout spawning occurs from March to mid-June, varying with elevation. Redd construction occurs at the downstream end of pools in a variety of gravel compositions, depths, and velocities, only after water temperatures reached 8° C (46.4_ F). Fry hatch in 30 days and emerge from redds after another 30 days, then exhibit nocturnal downstream movements. Diet primarily consists of aquatic and terrestrial insects. Feeding habits depend on fish size and season.

Apache trout are listed as threatened under the authority of the Endangered Species Act of 1973. The objective of the Apache Trout Recovery Plan (U.S. Fish and Wildlife Service 2009), is to restore this species to a non-threatened status. One of the goals under this objective is to establish or maintain 30 self-sustaining discrete populations of pure Apache trout throughout its historic range. Mineral Creek contains one of the 30 populations identified in the Recovery Plan.

Apache trout are present in Mineral Creek, approximately 6.5 miles downstream from the allotment boundary via the intermittent drainage Udall Draw. Udall Draw drains into the “east fork” of Mineral Creek, which is also intermittent. Apache trout occur in the perennial portions of Mineral Creek, below the confluence of the “east” and “west” forks as well as upstream in the “west” fork. The occupied sections of Mineral Creek include Mineral Creek, from Mineral Springs downstream to the fish migration barrier at the upper end of section 7, just above the ditch confluence. This small isolated population is considered to be viable according to Arizona Department of Game and Fish (AGFD) because it has been self-sustaining since the original stocking in the late 1960’s. It is also necessary to maintain this population for species recovery

Chiricahua leopard frog

Although species is not present on the allotment or in the action area, potential or suitable habitat may occur.

Leopard frogs as a group are habitat generalists that can adapt to a variety of wetland situations. Suitable Chiricahua leopard frog habitat includes lakes, rivers, streams, springs, ponds, and man-made structures such as reservoirs, stock tanks, and acequias. Species is found at elevations of 1,000-2,710 m (3,281-8,890 ft). It is occasionally found in livestock drinkers, irrigation sloughs and acequias, wells, abandoned swimming pools, backyard ponds, and mine adits. The frog uses permanent or nearly permanent pools and ponds for breeding. Most sites that support populations of this frog will hold water yearlong in most years. Shoreline vegetation and rooted aquatic vegetation that provide cover are important for population maintenance. Populations that occur in habitats only seasonally wetted and without vegetative cover, usually consist of metamorphs that disperse from the sites (U.S. Fish and Wildlife Service 2007). Time from hatching to metamorphosis is shorter in warm water than in cold water; water permanency is probably more important at higher elevations and in the northern portion of the species’ range. The species is rarely found in aquatic sites inhabited by non-native fish, bullfrogs, or crayfish. In complex systems or large aquatic sites, this species may occur in the presence of low densities of non-native predators (U.S. Forest Service 2004). The maximum-minimum water temperatures for Chiricahua leopard frog embryos were found to be 53.6°-88.7°F (U.S. Fish and Wildlife Service 2007).

In New Mexico, of sites occupied by Chiricahua leopard frogs from 1994 to 1999, 67% were creeks or rivers, 17% were springs or spring runs, and 12% were stock tanks. In Arizona, slightly more than half of historic localities were natural lotic systems, a little less than half were stock tanks, and the remainder, were lakes and reservoirs. As of 2004, 63% of extant populations in Arizona occupy stock tanks. Occupied habitat includes sites where the frog is known to occur or where it was present within the last 10 years, but no follow-up surveys have been conducted confirming its absence and suitable habitat is present (U.S. Forest Service 2004).

Potential habitats are those aquatic systems (within the historic range of the frog) that are damaged or degraded from natural perturbations or chronic stressors but have the appropriate hydrological and ecological components, which are capable of being restored to suitable habitat. Aquatic habitats may become unsuitable for Chiricahua leopard frogs, due to increased amounts

of sediments, non-native fish or invertebrates species presence, longer or more frequent periods of intermittency, reduce flows, dewatering of ponds or bank chiseling (U.S. Forest Service 2004).

Likely to be occupied habitat includes: 1) currently suitable habitat where the frog has been documented within the last 10 years, but is apparently now absent or 2) suitable habitat that is (a) within 1 mi overland of occupied habitat, (b) within 3 mi along an ephemeral or intermittent drainage from occupied habitat, or (c) within 5 mi along a perennial stream from occupied habitat. Most of the Forests have been surveyed extensively for ranid frogs within the last 10 years (U.S. Forest Service 2004).

Although the species does not have documented historical habitat in the action area it has been documented elsewhere in the watersheds of the Little Colorado River. Mineral Creek, Carnero Lake and Norton Reservoir provide potential or suitable habitat for the species, should it be introduced in the action area. Existing stock tanks could also provide supplemental habitat. The closest population of Chiricahua leopard frogs is found at Three Forks in the Black River, approximately 20 linear miles from the allotment.

Surveys conducted by the Springerville Ranger District in 2003 within Oso Draw and Big Hollow Wash watersheds did not find ranid frogs. Based on the criteria described above and the known distribution of the species supported with some survey data, there is no habitat likely to be occupied in the action area. Up to 10 miles of potential or suitable habitat in Mineral Creek (4 miles), Fish Creek (3 miles) and Carnero Creek (3 miles) are in the action area. Carnero Creek occurs on the allotment. Up to 3 acres of stock tank habitat & 150 acres of reservoir habitat in Carnero Lake (100 acres) and Norton Reservoir (50 acres) are potential breeding and dispersal habitat. Stock tanks and Carnero Lake occur on the allotment.

The U.S. Fish and Wildlife Service proposed critical habitat designation for the Chiricahua leopard frog on March 15, 2011 (U.S. Fish and Wildlife Service 2011). There is no proposed critical habitat in the action area. The nearest area proposed occurs in the Upper Black River Watershed approximately 20 direct linear miles from the allotment.

U.S. Forest Service Sensitive Species

The Region 3, Regional Forester's Sensitive Species List, dated 9/21/07 was utilized to identify aquatic and semi-aquatic species that could occur on the Springerville Ranger District and the Hall Allotment, specifically. Sensitive (S) or Candidate (C) species described below in Table 18 could occur on the District, and were considered for this analysis. Those species that are present in the action area or that have potential or suitable habitat in the action area have further analysis.

Table 18. Sensitive Species Status in Greens Peak Action Area

Common Name	Scientific	Status	Species Known to Occur Historically?	Species Known to Occur Currently?	Suitable or Potential Habitat in AA?
Little Colorado sucker	<i>Catostomus sp.</i> 3	S	Yes. Species in LCR from Forest boundary to SH 261 based on 1991 surveys (Young et al. 2001)	Yes. Downstream occurrence is approximately 12 miles from the allotment boundary off of the Forest in the LCR at the South Fork LCR confluence (Young et al 2001).	Yes. 7 miles of suitable or potential habitat occurs in the Little Colorado River, below the Fish Creek confluence to SH 261.
Bluehead sucker	<i>Catostomus discobolus discobolus</i>	S	Yes. Species in LCR from Forest boundary to River Reservoir based on 1991, 1996 surveys (Young et al. 2001).	No. Closest downstream occurrence is approximately 17 miles from the allotment boundary off of the Forest in the Little Colorado River (LCR) via the Fish Creek drainage system (Young et al. 2001)	Yes. 7 miles of suitable or potential habitat occurs in the Little Colorado River, below the Fish Creek confluence to SH 261.
Desert sucker	<i>Catostomus clarki</i>	S	No. No records of occurrence.	No. Not found in 5 th HUC watersheds. Occurs in the lower Colorado River downstream from the Grand Canyon, generally including the Bill Williams, Salt, Gila, and San Francisco River drainages (AGFD 2002).	No. Species not native to AA drainages.
Sonora sucker	<i>Catostomus insignis</i>	S	No. No records of occurrence.	No. Not found in 5 th HUC watersheds. Widespread in the Gila and Bill Williams river basins in Arizona (AGFD 2002).	No. Species not native to AA drainages.
Roundtail chub	<i>Gila robusta</i>	C/S	No. Historic habitat in the LCR, below Lyman Lake, over 20 miles from allotment, via the Carnero Creek drainage. Collected in 1939 (Young et al 2001)	No. Not found in 5 th HUC watersheds in GREENS PEAK. Occurs in the mainstem and tributaries of the Verde and Salt Rivers, as well as canals in metropolitan Phoenix (AGFD 2002).	No No perennial drainages connect the allotment to the LCR, below Lyman Lake. No suitable or potential habitat in the AA.
California floater	<i>Anodonta californiensis</i>	S	No Historically found in the Black, Salt, Santa Cruz, Verde, Gila and Colorado Rivers.	No. Not found in 5 th HUC watersheds. From British Columbia south throughout California into Chihuahua and possibly Sonora, Mexico. East to Washington, Oregon, Idaho, Wyoming, Utah, Nevada, and Arizona. Today it is found in Arizona only in the upper Black River in the Alpine Ranger	No Species not native to AA drainages.

				District of the Apache-Sitgreaves National Forest, Arizona, to at least the White Mountain Apache Reservation. An extant population may also occur in Chevelon Creek, a tributary to the LCR, located SE of Winslow, AZ (AGFD 2001).	
Three Forks springsnail	<i>Pyrgulopsis trivialis</i>	C/S	No No records of occurrence.	No. Not found in 5 th HUC watersheds. Found in several springs at Three Forks on the Black River on the southern slopes of the White Mountains, Apache County, Arizona (AGFD 2003).	No Species not native to AA drainages.
Arizona toad	<i>Bufo microscaphus</i>	S	No No records of occurrence.	No No populations in 5 th HUC watersheds.	Yes. Up to 10 miles of suitable or potential habitat in Mineral Creek, Fish Creek and Carnero Creek & up to 3 acres of stock tank habitat & 150 acres of reservoir habitat in Carnero Lake and Norton Reservoir.
Northern leopard frog	<i>Rana pipiens</i>	S	No No records of occurrence.	No. Species has been reported below the GREENS PEAK in Lyman Lake which is 20+ miles below the allotment in the LCR drainage, via the Carnero Creek drainage.	Yes. Up to 10 miles of suitable or potential habitat in Mineral Creek, Fish Creek and Carnero Creek & up to 3 acres of stock tank habitat & 150 acres of reservoir habitat in Carnero Lake and Norton Reservoir. Since species is mobile, potential or suitable habitats will be considered in the AA.
Mexican garter snake	<i>Thamnopsis eques megalops</i>	S	No. The historical distribution of Mexican garter snakes in the U.S. included the Santa Cruz, San Pedro, Colorado, Gila, Salt, Agua Fria, and Verde river watersheds in Arizona and the upper Gila River watershed in New Mexico. It also occurred from the United States border south through central Mexico, including the Sierra Madre Occidental and the Mexican Plateau.	No Not documented in 5 th HUC watersheds.	Yes. Up to 10 miles of suitable or potential habitat in Mineral Creek, Fish Creek and Carnero Creek & up to 3 acres of stock tank habitat & 150 acres of reservoir habitat in Carnero Lake and Norton Reservoir. Since species is mobile, potential or suitable habitats will be considered in the GREENS PEAK.
Narrow headed garter snake	<i>Thamnopsis rufipunctatus</i>	S	No No records of occurrence.	No Not documented in 5 th HUC watersheds.	Yes. Up to 10 miles of suitable or potential habitat in Mineral Creek, Fish Creek and Carnero Creek & up to

					3 acres of stock tank habitat & 150 acres of reservoir habitat in Carnero Lake and Norton Reservoir. Since species is mobile, potential or suitable habitats will be considered in the GREENS PEAK.
Arizona snaketail	<i>Ophiogomphus arizonicus</i>	S	No No records of occurrence.	No No records of occurrence.	Yes. Up to 10 miles of suitable or potential habitat adjacent to Mineral Creek, Fish Creek and Carnero Creek.
Ferris' copper	<i>Lycaena ferrisi</i>	S	No No records of occurrence.	No No records of occurrence.	Yes. Up to 11 miles of suitable or potential habitat adjacent to Mineral Creek, Fish Creek and Carnero Creek & along the perimeters of numerous stock tanks and reservoirs such as Carnero Lake and Norton Reservoir.
Four spotted skipperling	<i>Piruna polingi</i>	S	No No records of occurrence.	No No records of occurrence.	Yes. Up to 11 miles of suitable or potential habitat adjacent to Mineral Creek, Fish Creek and Carnero Creek & along the perimeters of numerous stock tanks and reservoirs such as Carnero Lake and Norton Reservoir.
Nokomis fritillary	<i>Speyeria nokomis nokomis</i>	S	No No records of occurrence.	No No records of occurrence.	Yes. Up to 11 miles of suitable or potential habitat adjacent to Mineral Creek, Fish Creek and Carnero Creek & along the perimeters of numerous stock tanks and reservoirs such as Carnero Lake and Norton Reservoir.
Nitrocris fritillary	<i>Speyeria nokomis nitrocris</i>	S	No No records of occurrence.	No No records of occurrence.	Yes. Up to 11 miles of suitable or potential habitat adjacent to Mineral Creek, Fish Creek and Carnero Creek & along the perimeters of numerous stock tanks and reservoirs such as Carnero Lake and Norton Reservoir.

Little Colorado Sucker

Status Summary: Species is not present on the allotment but is present in the action area. Potential/suitable habitat is also present in the action area.

This species is found from 2200' to 7100', principally in rocky pools and riffles of creeks and small to medium rivers with abundant cover (Minckley 1973). They are also found in impoundments. Spawning occurs in early to mid-spring (Minckley 1973, Rinne and Minckley 1991) in riffles. Species feeds on aquatic invertebrates, detrital material, algae and some higher vegetation (Minckley 1973).

Species is known to occur in the LCR, near St. Johns, upstream, to include the lower South Fork Little Colorado River (SFLCR). Little Colorado sucker are also found in other major tributaries to the LCR including Clear Creek drainage, Chevelon Creek and Silver Creek. Additionally, the species has been introduced into the Salt River watershed.

The Little Colorado sucker is the only fish known to occur in the action area. The species is not present on the allotment. Downstream occurrence is approximately 12 miles from the allotment boundary off of the Forest in the Little Colorado River via the Fish Creek drainage system and 20 miles downstream via the Carnero Creek drainage system. Seven miles of suitable or potential habitat in action area in the LCR below the Fish Creek confluence.

Bluehead Sucker

Status Summary: Species is not present in the action area, but potential/suitable habitat is present.

This species is commonly collected in small or mid-sized tributaries of the Upper Colorado River Basin with heavy sediment loads, high annual peak flows, and low base flows. Adult bluehead suckers exhibit a strong preference for rocky substrate and are typically found in runs or riffles with rock or gravel substrate while juveniles have been collected from shallow riffles, backwaters, and eddies with silt or gravel substrate. Species generally inhabits streams with cool temperatures but have been found in small creeks with water temperatures as high as 82.4 °F. Adults scrape algae and invertebrates off rocks with cartilaginous scraper. This long lived species has a lifespan of 20 years (Ptacek et al. 2005).

The species is known to occur in most of Nutrioso Creek, including Nelson Reservoir, and the LCR from Lyman Lake upstream to near the SFLCR. Bluehead suckers are also found in other major tributaries to the LCR including East Fork Little Colorado River, and in the Silver Creek, Chevelon Creek and Clear Creek watersheds. Species is documented outside the action area for Greens Peak Allotment, occurring 17 miles downstream from the allotment in the LCR, but suitable or potential habitat occurs in that portion of the LCR within the action area.

Southwestern toad

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species breeds from February-July (earlier at lower elevations) in streams but may be abroad until September. Breeding is not dependant on rainfall as with many other species. Egg strands are laid on bottom of pools. Found in rocky streams and canyons in the pine-oak belt and in lower deserts e.g. Agua Fria River area from near seal level to around 8,000 ft. (AGFD 2002).

Range within Arizona includes east to west central Arizona, canyons and flood plains south of the Mogollon Rim, but also found in East Clear Creek. Occurs in Apache, Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Navajo, and Yavapai counties (AGFD 2002).

On the Forest, the species has been documented in the Blue River and Eagle Creek watersheds (Sredl et al. 1994). Species not documented in the action area but potential/suitable habitat occurs on the allotment in Carnero Creek and Carnero Lake. In the action area, this habitat also occurs in Norton Reservoir, Fish Creek and Mineral Creek. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis.

Northern leopard frog

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

This highly aquatic amphibian occurs chiefly in the oak and mixed oak and pine woodlands. All leopard frogs are highly aquatic and almost always associated with permanent water, preferably with emergent and submergent vegetation (Sredl 1992, Stebbins 1985, Schwable 1988). It may also occur in wet meadows at higher elevations and has been found in stock ponds (Sredl, et al. 1994, AGFD 1994). Sixty-eight percent of known populations of this species in Arizona occur in lentic habitats with stock tanks constituting 46% of all known localities (Sredl, et al. 1997). Sredl et al. (1994) did not present habitat descriptions for this species, however, bank vegetation and aquatic macrophytes are common elements associated with perennial waters where leopard frogs are found on the ASNF. These components provide cover for adults, larvae, and eggs, and habitat for insect prey. AGFD (1994) noted that Northern leopard frogs utilizes a variety of habitats associated with permanent waters such as is found in ponds, canals, marshes, springs and streams.

Although Northern leopard frog are a wide ranging species, found in northern and central Arizona, they have not been documented in the action area. Surveys conducted by the Springerville Ranger District in 2003 within Oso Draw and Big Hollow Wash watersheds did not find ranid frogs. Recent sightings of Northern leopard frogs in Lyman Lake have been documented by AGFD, although this occurs 20+ miles from the allotment boundary. Based on the known distribution of the species supported with some survey data, there is no habitat likely to be occupied in the action area. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis.

In summary, there is no occupied habitat in the action area. Potential or suitable habitat for Northern leopard frogs occurs in perennial streams, lakes and stock tanks in the action area.

Mexican garter snake

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Mexican garter snakes are found in or near water in pine-oak forests, mesquite grasslands and desert from 2000' to 8500' in elevation in wetlands, streams and stock tanks. Mexican gartersnakes most frequently occur between 3,000 and 5,000 feet elevation. Often found foraging along streams, irrigation ditches and lakes for amphibian prey (Behler 1979). The most important habitat characteristics for the species are permanent water, dense bank and aquatic vegetation, and an abundance of frogs, toads and small fish (Rosen and Schwalbe 1988).

Species occurs in the southeast corner of state from the Santa Cruz Valley east and generally south of the Gila. Recent valid records (post 1980) occur from the San Rafael and Sonoita grasslands area and from Arivaca. It is also known from the Agua Fria River, Oak Creek, the Verde River, and from several upper Salt/Black River sites, including smaller tributaries (Rosen and Schwalbe 1988).

Species has not been documented in the action area and is not known to occur historically, but potential or suitable habitat is present. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis. It is assumed that all aquatic environments including streams and stock tanks could be utilized, although elevations on most of the allotments may be too high for occupancy (> 8500'). Habitat meeting this description can be found mainly on the northern end of Greens Peak Allotment.

Narrow-headed garter snake

Status Summary: *Species is not present in the action area although potential/suitable habitat is present.*

This species has been found in perennial rivers and creeks on the ASNF at elevations from 4900 to 7900 feet on the Alpine, Clifton, Chevelon and Springerville Ranger Districts, in the Black River, Blue River, Eagle Creek, and Chevelon Creek systems. Associated habitats include piñon-juniper, pine-oak and ponderosa pine habitats adjacent to perennial streams with rocky substrate (AZGF 1994). Foods of the narrow-headed garter snake include small fish, tadpoles and salamanders (Schwalbe 1985). Rosen and Schwalbe (1988) found this species abundant only where native fish were abundant. Rosen and Schwalbe (1988) determined important microhabitat features for narrow-headed garter snakes include the submerged interstitial spaces in emergent complexes of rocks and boulders in lotic systems. They concluded that although heavy siltation would eliminate this microhabitat, flooding in most Arizona streams prevents silt accumulation that would destroy this habitat component. Shrub-sized woody plants along streambanks are also important habitat features (Rosen and Schwalbe 1988).

There is no occupied habitat in the action area. The closest documented occurrence of the species is in the Upper Black River watershed, over 12 direct linear miles from the allotment. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis. Suitable or potential habitat is present since the species can utilize a variety of permanently wetted habitats including streams and perennial stock tanks, although elevations on most of the allotments may be too high for occupancy (> 7900'). Lower elevation habitat meeting this description can be found mainly on the northern end of Greens Peak Allotment.

Arizona snaketail

Status Summary: *Species is not present in the action area although potential/suitable habitat is present.*

Species is a fairly large mostly green dragonfly. The thorax is all green except for reduced black shoulder stripes, and an abdomen striped lengthwise. The larva is flat and brown with an oval abdomen. The *Ophiogomphus arizonicus* is nearly identical to *O. severus*, but the male epiproct is only half length of cerci (3/4 in *O. severus*), and the female has a straight post-ocellar ridge on vertex (strongly undulate in *O. severus*). And the larva has higher dorsal abdominal spines than *O. severus*. Range within Arizona includes Eastern Arizona. Reproduction behavior includes: The adult males perch on rocks near stream pools to wait for females. The females perch on a rock

until they accumulate a ball of eggs then fly out to deposit them in water. The larvae overwinter and the flight season is from early June to early September. They are invertivores as adults and immatures. They are found in fairly swift rocky mountain streams in pine woodland with silt for larval habitat. Elevation range, plant associations and population trends are unknown. The major threats to this population are lumbering, overgrazing and fires that destabilize stream flow. The larvae are susceptible degradation of water flow and alterations of stream flow (AGFD 2002).

Species not documented on the allotments but potential or suitable habitat could occur in riparian habitat along perennial Carnero Creek (3 mile) on Greens Peak Allotment and along Mineral and Fish Creeks (4 miles & 3 miles, respectfully) downstream from the allotment.

Ferris' copper

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Presumably like other coppers (butterfly) it does not move between habitat patches and widely within patches. It is likely to move along stream corridors especially. Reproduction behavior includes: One flight in late July and August. Aestivates then hibernates as an egg. They are larva in the spring, with the pupal stage probably about 10 days. *Rumex hymenosepalus* is the larval host. The adults feed on flower nectar including that of yellow composites. Species is associated with riparian areas near the foodplant *Rumex hymeospalus* (AGFD 2002).

Species not documented on the allotments but an estimated 11 miles of suitable or potential habitat could occur in riparian habitat along perennial Carnero Creek (3 mile) and Carnero Lake and numerous stock tank perimeters (0.7 mile total) on the allotment. Downstream from the allotment, habitat occurs along Mineral and Fish Creeks (4 miles & 3 miles, respectively) and on the perimeter of Norton Reservoir (0.3 mile).

Four Spotted skipperling

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species prefers grassy areas along mountain streams and ranges from Mexico into southern New Mexico and central Arizona and possibly into southern Utah. Not much is known about life history; flight dates are generally July and early August. Adults fly among streamside grasses and are attracted to flowers (Ferris and Brown 1981). Species is thought to be fairly common. Adults rest with their wings closed, but bask with the hindwings open wide and forewings open to about 45 degrees. Caterpillars live and feed within nests of webbed leaves. The adults fly in summer, mid-July to mid-September. Fully-grown caterpillars hibernate. They have also been seen congregating in numbers on moist cliffsides. There is a single rainy season brood between June and August. It occurs mostly in July north of the Gila River and slightly later south of it. The males patrol to find receptive females. Caterpillars likely feed on a native grass. Nothing is confirmed for the area but *Dactylis glomerata* (Poaceae) is strongly suspected. Adults feed on the nectar of various flowers including yellow composites. Found in moist woodland openings with lush vegetation, meadows, ravines and streamsides in the mountains (AGFD 2002).

Species not documented on the allotments but an estimated 11 miles of suitable or potential habitat could occur in riparian habitat along perennial Carnero Creek (3 mile) and Carnero Lake and numerous stock tank perimeters (0.7 mile total) on the allotment. Downstream from the

allotment, habitat occurs along Mineral and Fish Creeks (4 miles & 3 miles, respectfully) and on the perimeter of Norton Reservoir (0.3 mile).

Nokomis fritillary

Status Summary: *Species is not present in the action area although potential/suitable habitat is present.*

The wingspan of this butterfly is 2 ½ - 3 1/8 in. (6.3-7.9 cm). Also for the species the upper side of the male is a bright brownish orange with darkened wing bases and dark markings. Sub marginal chevrons do not touch the very even black marginal line. The upper side of the female is black and the outer half of the wing has cream-colored spots. Both sexes have hind wing below with black-bordered silver spots. For *Speyeria nokomis nokomis* the hind wing disc is light brown in males and deep olive in females. This species is found throughout the state of Arizona. The larvae are nocturnal. Reproduction behavior includes: for the species males patrol for receptive females, who walk on the ground to lie, singe eggs near host plants. Unfed, first-stage caterpillars hibernate and in the spring they feed on the leaves of the host. They have one brood from late July-September. Food habitats include: the caterpillar host plant is *Viola nephrophylla*. The adults feed on flower nectar including that from thistles. Found in streamside meadows and open seepage areas with an abundance of violets in generally desert landscapes. The colonies are often isolated. Elevation range, plant associations and population trends are unknown. Problems for the species as a whole mainly include habitat loss, along with herbiciding, heavy grazing and changes to hydrology. Over-collecting has not apparently been a problem so far but delayed reproduction by females increases impact from collecting on this genus (AGFD 2002).

Species not documented on the allotments but an estimated 11 miles of suitable or potential habitat could occur in riparian habitat along perennial Carnero Creek (3 mile) and Carnero Lake and numerous stock tank perimeters (0.7 mile total) on the allotment. Downstream from the allotment, habitat occurs along Mineral and Fish Creeks (4 miles & 3 miles, respectfully) and on the perimeter of Norton Reservoir (0.3 mile).

Nitocris fritillary

Status Summary: *Species is not present in the action area although potential/suitable habitat is present.*

The mountain silverspot butterfly is known to occupy alpine meadows (AZGF 2002). Typically, the mountain silverspot butterfly is found in wet meadows and along creeks and rivers from 5400 to 8500 feet elevation (Ferris and Fisher 1971). Adults feed on red thistles (Ferris and Fisher 1971), whereas the larvae are closely associated with violets (Ferris and Brown 1981). Red star thistle is not documented in Apache County, although violets do occur. Except when feeding, adult females generally keep to dense vegetation such as tall grass and willows bordering streams (Ferris and Fisher 1971).

The range of this subspecies extends across the Mogollon Rim region of Arizona, into the Mogollon Mountains and the mountains of northern New Mexico, and into southern Colorado where it is locally abundant (Ferris and Fisher 1971). This subspecies has been documented on the Chevelon, Alpine, and Springerville Ranger Districts (notes from files of U.S. Fish and Wildlife Service, Phoenix, Arizona).

Species not documented on the allotments but an estimated 11 miles of suitable or potential habitat could occur in riparian habitat along perennial Carnero Creek (3 mile) and Carnero Lake and numerous stock tank perimeters (0.7 mile total) on the allotment. Downstream from the

allotment, habitat occurs along Mineral and Fish Creeks (4 miles & 3 miles, respectfully) and on the perimeter of Norton Reservoir (0.3 mile).

Hall Allotment Threatened, Endangered and Sensitive Species

Threatened, Endangered or Sensitive fish, reptiles, amphibians, clams, snails, or insects documented on Hall Allotment or with potential or suitable habitat in the action area are listed below in Table 19. The majority of the action area includes portions of three 5th HUC watersheds: Oso Draw, Big Hollow Wash and Carnero Creek -Little Colorado River Headwaters. One other 5th HUC watershed has approximately 500 acres in the action area: Upper North Fork White River. Species described below in Table 19 could occur on the District, but do not occur on the allotment. Those species that are present in the action area or that have potential or suitable habitat in the action area (AA) have further analysis.

Table 19. Aquatic Threatened (T), Endangered (E), Experimental, and Proposed Threatened (PT) or Proposed Endangered (PE) Species in Hall Allotment Action Area

Common Name	Scientific	Status	Critical Habitat Designated?	Critical Habitat in HALL?	Species Known to Occur Historically?	Species Known to Occur Currently?	Suitable or Potential Habitat in AA?
Little Colorado spinedace & critical habitat	<i>Lepidomeda vittata</i>	T	Yes	No Critical habitat not in AA. Closest critical habitat is over 20 linear miles from the allotment in Nutrioso Creek.	No Species not known to occur in the AA.	No Closest occurrence of species is in the Little Colorado River (LCR), over 18 miles from allotment via unnamed intermittent tributaries to the LCR	No Closest potential or suitable habitat is over 20 miles from allotment in the LCR, above Lyman Lake.
Apache trout	<i>Oncorhynchus apache</i>	T	No	No	Yes Species stocked into Mineral Creek in the 1960's.	Yes	Yes 4 miles of occupied habitat in Mineral Creek, approx. 3 miles downstream from allotment.
Loach minnow & proposed critical habitat	<i>Tiaroga cobitis</i>	T ¹	Proposed ¹	No Proposed critical habitat does not occur in action area. Closest occurrence is over 22 linear miles from the allotment In the Black River watershed.	No Species not known to occur in 5 th HUC watersheds in AA.	No Closest occurrence of species and proposed critical habitat is in the Upper Black River watershed, over 22 direct linear miles from the allotment.	No Species not native to Little Colorado River drainages.
Chiricahua leopard frog & proposed critical	<i>Lithobates chiricahuensis</i>	T	Proposed	No Proposed critical	No Species not known to	No Closest occurrence is	Yes 4 miles of potential or

habitat				habitat does not occur in action area. Closest occurrence is over 22 linear miles from the allotment at Three Forks, Black River.	occur in 5 th HUC watersheds in AA.	over 22 linear miles from the allotment at Three Forks, Black River.	suitable habitat in Mineral Creek, & up to 3 acres of stock tank habitat.
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¹On Oct. 28, 2010, the U.S. Fish and Wildlife Service proposed to change the status of loach minnow (*Tiaroga cobitis*) from threatened to endangered under the Endangered Species Act of 1973, as amended, and to designate critical habitat.

Apache Trout

Species is not present on the allotment but does occur in the action area.

Apache trout are present in Mineral Creek, approximately 3 miles downstream from the allotment boundary via the intermittent drainage Udall Draw. Udall Draw drains into the “east fork” of Mineral Creek, which is also intermittent. Apache trout occur in the perennial portions of Mineral Creek, below the confluence of the “east” and “west” forks as well as upstream in the “west” fork. The occupied sections of Mineral Creek include Mineral Creek, from Mineral Springs downstream to the fish migration barrier at the upper end of section 7, just above the ditch confluence. This small isolated population is considered to be viable according to Arizona Department of Game and Fish (AGFD) because it has been self-sustaining since the original stocking in the late 1960’s. It is also necessary to maintain this population for species recovery

In the action area, Apache trout are present in Mineral Creek, approximately three miles downstream from the allotment boundary via the intermittent drainage, Udall Draw.

Chiricahua leopard frog

Although species is not present on the allotment or in the action area, potential or suitable habitat may occur.

Although the species does not have documented historical habitat in the action area it has been documented elsewhere in the watersheds of the Little Colorado River. Mineral Creek provides potential or suitable habitat for the species, should it be introduced in the action area. Existing stock tanks could also provide supplemental habitat. The closest population of Chiricahua leopard frogs is found at Three Forks in the Black River, approximately 22 linear miles from the allotment.

Surveys conducted by the Springerville Ranger District in 2003 within Oso Draw and Big Hollow Wash watersheds did not find ranid frogs. Based on the criteria described above and the known distribution of the species supported with some survey data, there is no habitat likely to be occupied in the action area. Up to 4 miles of potential or suitable habitat in Mineral Creek is downstream from the allotment and up to 3 acres of stock tank habitat occur on the allotment.

There is no proposed critical habitat in the action area. The nearest area proposed occurs in the Upper Black River Watershed approximately 22 direct linear miles from the allotment.

U.S. Forest Service Sensitive Species

The Region 3, Regional Forester’s Sensitive Species List, dated 9/21/07 was utilized to identify aquatic and semi-aquatic species that could occur on the Springerville Ranger District and the Hall Allotment, specifically. Sensitive (S) or Candidate (C) species described below in Table 20 could occur on the District, and were considered for this analysis. Those species that are present in the action area or that have potential or suitable habitat in the action area have further analysis.

Table 20. Sensitive Species Status in Hall Allotment Action Area

Common Name	Scientific	Status	Species Known to Occur Historically?	Species Known to Occur Currently?	Suitable or Potential Habitat in AA?
Little Colorado sucker	<i>Catostomus sp. 3</i>	S	No Species not known to occur in the AA. Species is known to occur in the LCR, near St. Johns, upstream, to include the lower South Fork Little Colorado River (SFLCR); also found in other major tributaries to the LCR including Clear Creek drainage, Chevelon Creek and Silver Creek. Additionally, the species has been introduced into the Salt River watershed.	No Closest occurrence of species is in the Little Colorado River (LCR), over 18 miles from allotment via unnamed intermittent tributaries to the LCR	No Closest potential or suitable habitat is over 18 miles from allotment in the LCR, above Lyman Lake.
Bluehead sucker	<i>Catostomus discobolus discobolus</i>	S	No This species is commonly collected in small or mid-sized tributaries of the Upper Colorado River Basin. Species is known to occur in most of Nutrioso Creek, including Nelson Reservoir, and the LCR from Lyman Lake upstream to near the SFLCR. Bluehead suckers are also found in other major tributaries to the LCR including East Fork Little Colorado River, and in the Silver Creek, Chevelon Creek and Clear Creek watersheds.	No Closest occurrence of species is in the Little Colorado River (LCR), over 18 miles from allotment via unnamed intermittent tributaries to the LCR	No Closest potential or suitable habitat is over 18 miles from allotment in the LCR, above Lyman Lake.
Desert sucker	<i>Catostomus clarki</i>	S	No No records of occurrence.	No. Not found in 5 th HUC watersheds. Occurs in the lower Colorado River downstream from the Grand Canyon, generally including the Bill Williams, Salt, Gila, and San Francisco River drainages (AGFD 2002).	No Species not native to AA drainages.
Sonora sucker	<i>Catostomus insignis</i>	S	No No records of occurrence.	No. Not found in 5 th HUC watersheds. Widespread in the Gila and Bill Williams river basins in Arizona (AGFD 2002).	No Species not native to AA drainages.
Roundtail chub	<i>Gila robusta</i>	C/S	No Historic habitat in the LCR, below Lyman Lake, over 25 miles from allotment. Collected in 1939 (Young et al	No. Not found in 5 th HUC watersheds in AA. Occurs in the mainstem and tributaries of the Verde and Salt Rivers, as well as canals in metropolitan Phoenix (AGFD 2002).	No

			2001)		
California floater	<i>Anodonta californiensis</i>	S	No Historically found in the Black, Salt, Santa Cruz, Verde, Gila and Colorado Rivers.	No. Not found in 5 th HUC watersheds. From British Columbia south throughout California into Chihuahua and possibly Sonora, Mexico. East to Washington, Oregon, Idaho, Wyoming, Utah, Nevada, and Arizona. Today it is found in Arizona only in the upper Black River in the Alpine Ranger District of the Apache-Sitgreaves National Forest, Arizona, to at least the White Mountain Apache Reservation. An extant population may also occur in Chevelon Creek, a tributary to the LCR, located SE of Winslow, AZ (AGFD 2001).	No Species not native to HALL drainages.
Three Forks springsnail	<i>Pyrgulopsis trivialis</i>	C/S	No No records of occurrence.	No. Not found in 5 th HUC watersheds. Found in several springs at Three Forks on the Black River on the southern slopes of the White Mountains, Apache County, Arizona (AGFD 2003).	No Species not native to HALL drainages.
Arizona toad	<i>Bufo microscaphus</i>	S	No No records of occurrence.	No No populations in 5 th HUC watersheds.	Yes. 4 miles of potential /suitable habitat in Mineral Creek and estimated 3 acres of stock tanks.
Northern leopard frog	<i>Rana pipiens</i>	S	No No records of occurrence.	No. Although species has been reported in Lyman Lake which is 20+ miles below the allotment in the LCR drainage.	Yes. 4 miles of potential /suitable habitat in Mineral Creek and estimated 3 acres of stock tanks.
Mexican garter snake	<i>Thamnopsis eques megalops</i>	S	No. The historical distribution of Mexican garter snakes in the U.S. included the Santa Cruz, San Pedro, Colorado, Gila, Salt, Agua Fria, and Verde river watersheds in Arizona and the upper Gila River watershed in New Mexico. It also occurred from the United States border south through central Mexico, including the Sierra Madre Occidental and the Mexican Plateau.	No Not documented in 5 th HUC watersheds.	Yes 4 miles of potential /suitable habitat within & adjacent to Mineral Creek and estimated 3 acres of stock tanks.
Narrow headed garter snake	<i>Thamnopsis rufipunctatus</i>	S	No No records of occurrence.	No Not documented in 5 th HUC watersheds.	Yes. 4 miles of potential /suitable habitat within & adjacent to Mineral Creek and estimated 3 acres of stock tanks.
Arizona snaketail	<i>Ophiogomphus arizonicus</i>	S	No No records of occurrence.	No No records of occurrence.	Yes. 4 miles of potential /suitable habitat adjacent to Mineral Creek.
Ferris'	<i>Lycaena</i>	S	No	No	Yes. 4.5 miles of potential /suitable

copper	<i>ferrisi</i>		No records of occurrence.	No records of occurrence.	habitat adjacent to Mineral Creek and along the perimeters of stock tanks.
Four spotted skipperling	<i>Piruna polingi</i>	S	No No records of occurrence.	No No records of occurrence.	Yes. 4.5 miles of potential /suitable habitat adjacent to Mineral Creek and along the perimeters of stock tanks.
Nokomis fritillary	<i>Speyeria nokomis nokomis</i>	S	No No records of occurrence.	No No records of occurrence.	Yes. 4.5 miles of potential /suitable habitat adjacent to Mineral Creek and along the perimeters of stock tanks.
Nitrocris fritillary	<i>Speyeria nokomis nitrocris</i>	S	No No records of occurrence.	No No records of occurrence.	Yes. 4.5 miles of potential /suitable habitat adjacent to Mineral Creek and along the perimeters of stock tanks.

Southwestern toad

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

On the Forest, the species has been documented in the Blue River and Eagle Creek watersheds (Sredl et al. 1994). Species not documented in the action area but 4 miles of potential/suitable habitat occurs within Mineral Creek and approximately 3 acres of stocktanks on the allotment. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis.

Northern leopard frog

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Surveys conducted by the Springerville Ranger District in 2003 within Oso Draw and Big Hollow Wash watersheds did not find ranid frogs. Recent sightings of Northern leopard frogs in Lyman Lake have been documented by AGFD, although this occurs 20+ miles from the allotment boundary. Based on the known distribution of the species supported with some survey data, there is no habitat likely to be occupied in the action area. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis.

There is no occupied habitat in the action area. Potential or suitable habitat for Northern leopard frogs includes up to 4 miles of Mineral Creek. There is also up to 3 acres of potential breeding and dispersal habitat in the stock tanks that exist throughout the action area.

Mexican garter snake

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species has not been documented in the action area and is not known to occur, but potential or suitable habitat is present. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis. It is assumed that all aquatic environments including streams and stock tanks could be utilized, although elevations on most of the allotments may be too high for occupancy (> 8500'). Habitat meeting this description can be found mainly on the northern end of Hall Allotment.

There is no occupied habitat in the action area. The closest documented occurrence of the species is in the Upper Black River watershed, over 22 direct linear miles from the allotment. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis. Suitable or potential habitat is present since the species can utilize a variety of permanently wetted habitats including streams and perennial stock tanks, although elevations on most of the allotments may be too high for occupancy (> 7900'). Lower elevation habitat meeting this description can be found mainly on the northern end of Hall Allotment.

There are up to 3 acres of perennial stock tanks on Hall Allotment and downstream from the

allotment, 4 miles of stream in Mineral Creek that will be considered potential or suitable habitat for Mexican garter snake.

Narrow-headed garter snake

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

There is no occupied habitat in the action area. The closest documented occurrence of the species is in the Upper Black River watershed, over 22 direct linear miles from the allotment. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis. Suitable or potential habitat is present since the species can utilize a variety of permanently wetted habitats including streams and perennial stock tanks, although elevations on most of the allotments may be too high for occupancy (> 7900'). Lower elevation habitat meeting this description can be found mainly on the northern end of Hall Allotment.

There are up to 3 acres of perennial stock tanks on Hall Allotment and downstream from the allotment, 4 miles of stream in Mineral Creek that will be considered potential or suitable habitat for Mexican garter snake.

Arizona snaketail

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species not documented on the allotments but potential or suitable habitat could occur in riparian habitat along perennial Mineral Creek downstream from the allotment.

Ferris' copper

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species not documented on the allotment but an estimated 4 miles of potential or suitable habitat could occur in riparian habitat along perennial Mineral Creek, 3 miles downstream from the allotment boundary. One-half mile of stock tank perimeter habitat will also be considered potential/suitable habitat for the species.

Four Spotted skipperling

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species is not documented in the action area for Hall Allotment but potential or suitable habitat exists wherever the food plants are found which would include perennial Mineral Creek and adjacent to action area stock tanks.

Nokomis fritillary

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species is not documented in the action area for any of the allotments but suitable or potential habitat exists wherever the host plant is found. An estimated 4 miles of potential or suitable

habitat could occur in riparian habitat along perennial Mineral Creek, 3 miles downstream from the allotment boundary. One-half mile of stock tank perimeter habitat will also be considered potential/suitable habitat for the species.

Nitocris fritillary

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species is not documented in the action area for any of the allotments but suitable or potential habitat exists wherever the host plant is found. An estimated 4 miles of potential or suitable habitat could occur in riparian habitat along perennial Mineral Creek, 3 miles downstream from the allotment boundary. One-half mile of stock tank perimeter habitat will also be considered potential/suitable habitat for the species.

Cerro Trigo Allotment Threatened, Endangered and Sensitive Species

Threatened, Endangered or Sensitive fish, reptiles, amphibians, clams, snails, or insects documented on Cerro Trigo Allotment or with potential or suitable habitat in the action area are listed below in Table 21. The action area includes portions of three 5th HUC watersheds: Oso Draw, Big Hollow Wash and Carnero Creek -Little Colorado River Headwaters. Species described below in Table 21 could occur on the District, but do not occur on the allotment. Those species that are present in the action area or that have potential or suitable habitat in the action area (AA) have further analysis.

Table 21. Threatened (T), Endangered (E), Experimental, and Proposed Threatened (PT) or Proposed Endangered (PE) Species in Cerro Trigo Allotment Action Area

Common Name	Scientific	Status	Critical Habitat Designated ?	Critical Habitat in AA?	Species Known to Occur Historically?	Species Known to Occur Currently?	Suitable or Potential Habitat in AA?
Little Colorado spinedace & critical habitat	<i>Lepidomeda vittata</i>	T	Yes	No Critical habitat not in AA. Closest critical habitat is over 21 linear miles from the allotment in Nutrioso Creek.	No Species not known to occur in the AA.	No Closest occurrence of species is in the Little Colorado River (LCR), over 18 miles from allotment via unnamed intermittent tributaries to the LCR	No Closest potential or suitable habitat is over 18 miles from allotment in the LCR, above Lyman Lake.
Apache trout	<i>Oncorhynchus apache</i>	T	No	No	No Species not known to occur in the AA. No perennial streams in AA.	No Species not known to occur in the AA. No perennial streams in AA.	No No perennial streams in AA.
Loach minnow & proposed critical habitat	<i>Tiaroga cobitis</i>	T ¹	Proposed ¹	No Proposed critical habitat does not occur in action area. Closest occurrence is over 25 linear miles from the allotment in the Black River watershed.	No Species not known to occur in 5 th HUC watersheds in AA.	No Closest occurrence of species and proposed critical habitat is in the Upper Black River watershed, over	No Species not native to Little Colorado River drainages. allotment.

						25 direct linear miles from the	
Chiricahu a leopard frog & proposed critical habitat	<i>Lithobates chiricahuensis</i>	T	Proposed	No Proposed critical habitat does not occur in action area. Closest occurrence is over 25 linear miles from the allotment at Three Forks, Black River.	No Species not known to occur in 5 th HUC watersheds in AA.	No	Yes 1 acre of stock tanks on allotment.

¹On Oct. 28, 2010, the U.S. Fish and Wildlife Service proposed to change the status of loach minnow (*Tiaroga cobitis*) from threatened to endangered under the Endangered Species Act of 1973, as amended, and to designate critical habitat.

Chiricahua leopard frog

Although species is not present on the allotment or in the action area, potential or suitable habitat may occur.

Although the species does not have documented historical habitat in the action area it has been documented elsewhere in the watersheds of the Little Colorado River. Existing stock tanks could provide habitat. The closest population of Chiricahua leopard frogs is found at Three Forks in the Black River, approximately 25 linear miles from the allotment.

Surveys conducted by the Springerville Ranger District in 2003 within Oso Draw and Big Hollow Wash watersheds did not find ranid frogs. Based on the criteria described above and the known distribution of the species supported with some survey data, there is no habitat likely to be occupied in the action area. Up to 1 acres of potential or suitable habitat in stock tanks occur on the allotment.

There is no proposed critical habitat in the action area. The nearest area proposed occurs in the Upper Black River Watershed approximately 25 direct linear miles from the allotment.

U.S. Forest Service Sensitive Species

The Region 3, Regional Forester’s Sensitive Species List, dated 9/21/07 was utilized to identify aquatic and semi-aquatic species that could occur on the Springerville Ranger District and the Hall Allotment, specifically. Sensitive (S) or Candidate (C) species described below in Table 22 could occur on the District, and were considered for this analysis. Those species that are present in the action area or that have potential or suitable habitat in the action area have further analysis.

Table 22. Sensitive Species Status in Cerro Trigo Allotment Action Area

Common Name	Scientific	Status	Species Known to Occur Historically?	Species Known to Occur Currently?	Suitable or Potential Habitat in AA?
Little Colorado sucker	<i>Catostomus sp.</i> 3	S	No Species not known to occur in the AA. Species is known to occur in the LCR, near St. Johns, upstream, to include the lower South Fork Little Colorado River (SFLCR): also found in other major tributaries to the LCR including Clear Creek drainage, Chevelon Creek and Silver Creek. Additionally, the species has been introduced into the Salt River watershed.	No Closest occurrence of species is in the Little Colorado River (LCR), over 18 miles from allotment via unnamed intermittent tributaries to the LCR	No Closest potential or suitable habitat is over 18 miles from allotment in the LCR, above Lyman Lake.

Bluehead sucker	<i>Catostomus discobolus discobolus</i>	S	No Species not known to occur in the AA. This species is commonly collected in small or mid-sized tributaries of the Upper Colorado River Basin. Species is known to occur in most of Nutrioso Creek, including Nelson Reservoir, and the LCR from Lyman Lake upstream to near the SFLCR. Bluehead suckers are also found in other major tributaries to the LCR including East Fork Little Colorado River, and in the Silver Creek, Chevelon Creek and Clear Creek watersheds.	No Closest occurrence of species is in the Little Colorado River (LCR), over 18 miles from allotment via unnamed intermittent tributaries to the LCR	No Closest potential or suitable habitat is over 18 miles from allotment in the LCR, above Lyman Lake.
Desert sucker	<i>Catostomus clarki</i>	S	No No records of occurrence.	No Not found in 5 th HUC watersheds. Occurs in the lower Colorado River downstream from the Grand Canyon, generally including the Bill Williams, Salt, Gila, and San Francisco River drainages (AGFD 2002).	No Species not native to AA drainages.
Sonora sucker	<i>Catostomus insignis</i>	S	No No records of occurrence.	No Not found in 5 th HUC watersheds. Widespread in the Gila and Bill Williams river basins in Arizona (AGFD 2002).	No Species not native to AA drainages.
Roundtail chub	<i>Gila robusta</i>	C/S	No Historic habitat in the LCR, below Lyman Lake, over 25 miles from allotment. Collected in 1939 (Young et al 2001)	No Not found in 5 th HUC watersheds in AA. Occurs in the mainstem and tributaries of the Verde and Salt Rivers, as well as canals in metropolitan Phoenix (AGFD 2002).	No
California floater	<i>Anodonta californiensis</i>	S	No Historically found in the Black, Salt, Santa Cruz, Verde, Gila and Colorado Rivers.	No Not found in 5 th HUC watersheds. From British Columbia south throughout California into Chihuahua and possibly Sonora, Mexico. East to Washington, Oregon, Idaho, Wyoming, Utah, Nevada, and Arizona. Today it is found in Arizona only in the upper Black River in the Alpine Ranger District of the Apache-Sitgreaves National Forest, Arizona, to at least the White Mountain Apache Reservation. An extant population may also occur in Chevelon Creek, a tributary to the LCR, located SE of Winslow, AZ (AGFD 2001).	No Species not native to AA drainages.
Three Forks springsnail	<i>Pyrgulopsis trivialis</i>	C/S	No No records of occurrence.	No Not found in 5 th HUC watersheds. Found in several	No Species not native to AA

				springs at Three Forks on the Black River on the southern slopes of the White Mountains, Apache County, Arizona (AGFD 2003).	drainages.
Arizona toad	<i>Bufo microscaphus</i>	S	No No records of occurrence.	No No populations in 5 th HUC watersheds.	Yes 1 acre of stock tanks on allotment.
Northern leopard frog	<i>Rana pipiens</i>	S	No No records of occurrence.	No Although species has been reported in Lyman Lake which is 25+ miles below the allotment in the LCR drainage.	Yes 1 acre of stock tanks on allotment.
Mexican garter snake	<i>Thamnopsis eques megalops</i>	S	No The historical distribution of Mexican garter snakes in the U.S. included the Santa Cruz, San Pedro, Colorado, Gila, Salt, Agua Fria, and Verde river watersheds in Arizona and the upper Gila River watershed in New Mexico. It also occurred from the United States border south through central Mexico, including the Sierra Madre Occidental and the Mexican Plateau.	No Not documented in 5 th HUC watersheds.	Yes 1 acre of stock tanks on allotment.
Narrow headed garter snake	<i>Thamnopsis rufipunctatus</i>	S	No No records of occurrence.	No Not documented in 5 th HUC watersheds. No No perennial streams in AA. Associated habitats include piñon-juniper, pine-oak and ponderosa pine habitats adjacent to perennial streams with rocky substrate (AZGF 1994).	No No perennial streams in AA.
Arizona snaketail	<i>Ophiogomphus arizonicus</i>	S	No No records of occurrence.	No No perennial streams in AA They are found in fairly swift rocky mountain streams in pine woodland with silt for larval habitat (AGFD 2002).	No No perennial streams in AA.
Ferris' copper	<i>Lycaena ferrisi</i>	S	No No records of occurrence.	No No records of occurrence.	Yes <1 acre of riparian habitat on stock tank perimeter.
Four spotted skipperling	<i>Piruna polingi</i>	S	No No records of occurrence.	No No records of occurrence.	Yes <1 acre of riparian habitat on stock tank perimeter.
Nokomis fritillary	<i>Speyeria nokomis nokomis</i>	S	No No records of occurrence.	No No records of occurrence.	Yes <1 acre of riparian habitat on stock tank perimeter.
Nitrocris fritillary	<i>Speyeria nokomis nitrocris</i>	S	No No records of occurrence.	No No records of occurrence.	Yes <1 acre of riparian habitat on stock tank perimeter.

Southwestern toad

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

On the Forest, the species has been documented in the Blue River and Eagle Creek watersheds (Sredl et al. 1994). Species not documented in the action area but potential or suitable habitat occurs. 1 acre of stock tank habitat occurs on the on allotment. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis.

Northern leopard frog

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Surveys conducted by the Springerville Ranger District in 2003 within Oso Draw and Big Hollow Wash watersheds did not find ranid frogs. Recent sightings of Northern leopard frogs in Lyman Lake have been documented by AGFD, although this occurs 20+ miles from the allotment boundary. Based on the known distribution of the species supported with some survey data, there is no habitat likely to be occupied in the action area. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis.

In summary, there is no occupied habitat in the action area. Potential or suitable habitat for Northern leopard frogs occurs in 1 acre of stock tank habitat on allotment. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis.

Mexican garter snake

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species has not been documented in the action area and is not known to occur, but potential or suitable habitat is present. Since species is mobile across the landscape, and could theoretically move from watershed to watershed, potential or suitable habitats in the action area will be considered for this analysis. It is assumed that all aquatic environments including streams and stock tanks could be utilized, although elevations on most of the allotments may be too high for occupancy (> 8500'). Stock tank habitat meeting this description is dispersed throughout the allotment, covering approximately 1 acre.

Ferris' copper

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species not documented on the allotment but less than one acre of potential or suitable habitat could occur in riparian habitat adjacent to allotment stock tanks.

Four Spotted skipperling

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species not documented on the allotment but less than one acre of potential or suitable habitat could occur in riparian habitat adjacent to allotment stock tanks.

Nokomis fritillary

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species is not documented in the action area for any of the allotments but potential or suitable habitat exists wherever the host plant is found. Species not documented on the allotment but less than one acre of potential or suitable habitat could occur in riparian habitat adjacent to allotment stock tanks.

Nitocris fritillary

Status Summary: Species is not present in the action area although potential/suitable habitat is present.

Species is not documented in the action area for any of the allotments but potential or suitable habitat exists wherever the host plant is found. Species not documented on the allotment but less than one acre of potential or suitable habitat could occur in riparian habitat adjacent to allotment stock tanks.

Environmental Consequences Federally Listed Endangered, Threatened, and Proposed Species Including Designated Critical Habitat

Little Colorado Spinedace

Greens Peak Allotment

Alternative 1- No Action Alternative

Direct and Indirect Effects

There will be no direct effects to the species or its critical habitat with the implementation of this alternative since the species is not present in the project area. Indirect sedimentation effects to occupied habitats will not occur under this alternative.

Potential for indirect effects to the species or its critical habitat will not occur. With the long-term removal of livestock from all pastures, conditions across the watershed, such as maintenance of groundcover and riparian condition should improve the quickest.

This alternative would have a greater potential for improving watershed conditions through increased groundcover more quickly, as compared to Alternative 2. This alternative would likely best meet the needs of aquatic and riparian associated species by expediting improvements to watershed, soils, and riparian recovery through removal of livestock grazing direct and indirect impacts to stream channels and upland watershed conditions by the removing all livestock impacts to aquatic habitats in the future.

Cumulative Effects to Little Colorado Spinedace and Critical Habitat

There will be no cumulative effects from this “No Action” alternative.

Determination of Effects. **Based on the above discussion, in consideration with past, present and future foreseeable impacts, Alternative 1 may beneficially affect Little Colorado Spinedace. Implementation of the proposed action will not affect critical habitat.**

Alternative 2- Proposed Action

Direct and Indirect Effects

With the implementation of this alternative, measurable indirect impacts to spinedace and its critical habitat are not expected to occur. This alternative should maintain current watershed conditions through continuation of groundcover to the greatest extent possible with the current tree density and herbaceous species composition. Sedimentation effects to downstream habitats will be minimal with the maintenance of good watershed and riparian condition on the allotment.

Riparian areas are critical areas on the allotment. Where the potential exists, we will maintain stubble heights of herbaceous vegetation at the green line of streamside perennial vegetation (6 inches for streams and in hydrophilic vegetation in wetlands in satisfactory condition; 8 inches if less than satisfactory).

The proposed livestock management strategy should reduce indirect effects to Little Colorado spinedace to a discountable level by limiting sediment contribution to the LCR. No critical habitat is present in the action area. Monitoring described in Appendix A will document improvements or declines in watershed conditions from which management adjustments can be made in order to achieve desired conditions.

Cumulative Effects to Little Colorado Spinedace

Cumulatively, this alternative adds no appreciable adverse impacts to species of concern within the action area. Livestock grazing management on these allotments will achieve or maintain good riparian conditions which limit sediment movement into downstream habitats. Cumulatively, livestock grazing on the allotments when considered with Wallow Fire effects would contribute negligible effects to the Little Colorado Spinedace or its critical habitat due to the location of the allotments outside the Wallow Fire burn perimeter.

Nonetheless, aquatic species and their habitats are affected by past and present management activities as well as natural events in the action area. Most of these types of activities increase watershed erosion rates which can have adverse effects to aquatic species of concern. Future foreseeable activities include revision of an adjacent grazing allotment management plan for Harris Lake Allotment, north of Greens Peak Allotment. The 1995 Harris Lake decision allows 277 cow/calf pairs to graze from 6/16 to 10/15 annually.

Non-Federal ongoing actions include: livestock grazing on state and private lands south of the allotment, off of the Forest; water withdrawals from Fish and Carnero Creek; and water impoundment at the Greer Lakes in the LCR will continue by state & private water rights holders. Water impoundment and removal from drainages and springs in the action area will affect the amount of habitat that is available to Little Colorado spinedace in the LCR. There are no additional state, tribal or non-Federal actions that are reasonably certain to occur within the action area.

Over the short (≤ 5 years) and long-term (≥ 6 years), cumulative sediment inputs from future foreseeable activities will occur but effects from implementation of this action are not expected to be at a level to measurably affect Little Colorado spinedace.

Determination of Effects. Based on the above discussion, the proposed action may effect, but is not likely to adversely affect Little Colorado Spinedace. The proposed action will not affect Little Colorado spinedace critical habitat.

Apache trout

Alternative 1- No Action Alternative-

Greens Peak & Hall Allotments

Direct and Indirect Effects

There will be no direct effects to the species with the implementation of this alternative since the species is not present in the project area. Indirect sedimentation effects to occupied habitats will not occur under this alternative.

Potential for indirect effects to the species will not occur. With the long-term removal of livestock from all pastures, conditions across the watershed, such as maintenance of groundcover, should improve, thereby increasing HCI ratings for Mineral Creek.

With the long-term removal of livestock from all pastures, conditions in most riparian areas, both lentic and lotic, would improve immediately. Good riparian condition would likely be achieved in most areas and healthy stands of sedges and rushes would have the opportunity to increase in density and vigor, although grazing by elk could still be detrimental.

Because healthy and abundant riparian vegetation slows water flow, promotes lower water temperatures, and reduces sediments in the water, habitats for amphibians, invertebrates, and fish would be improved. Dense, vigorous riparian will also maximize habitat availability for the riparian dependent insects and reptiles identified as potentially occurring in the action area. Also, increases in available herbaceous vegetation would mean more litter for soil protection and enrichment in riparian habitats. Increased riparian ground cover would reduce erosion and sediment delivered to streams, thus reducing impacts to aquatic species. Expeditions reductions in suspended sediments and bedloads to more natural levels will benefit Apache trout in the action area.

This alternative would have the greatest potential for restoration of the riparian areas to full potential in less time as compared to the action alternative. Threatened Apache trout would benefit more quickly under this non-use alternative than they would under Alternative 2. With the removal of livestock grazing, degraded riparian areas such as Udall Draw and Potato Patch, would have the opportunity to reach satisfactory condition faster and more quickly lower erosion rates that could affect Mineral Creek as compared to Alternative 2. Rather than trying to maintain a minimum stubble height in riparian areas as is proposed in the action alternatives, these areas would be allowed to reach their full potential that is achievable with continued wild ungulate grazing impacts. This alternative would best meet the needs of aquatic and riparian associated species by not only expediting improvements to watershed, soils, and riparian recovery through removal of livestock grazing direct and indirect impacts to stream channels, but also through the long-term removal of all potential livestock impacts to aquatic habitats in the future.

Cumulative Effects to Apache trout

There will be no cumulative effects from this “No Action” alternative.

Determination of Effects. Based on the above discussion, in consideration with past, present and future foreseeable impacts, Alternative 1 may beneficially affect Apache trout.

Alternative 2- Proposed Action

Direct and Indirect Effects

Since Apache trout are not found on the allotment, no direct effects will occur with the implementation of this action.

With the implementation of this alternative, conditions in riparian areas should be maintained or improve to at least a functionally acceptable level. Land-use practices such as timber harvest/thinning, prescribed fire, and livestock grazing can affect healthy riparian corridors that promote sufficient habitat conditions to allow for all life functions including spawning, hatching, rearing, foraging, loafing, and over-wintering. Management activities (such as construction or upland watershed changes) that affect riparian conditions also contributed to the species decline (AGFD 2001, U.S. Fish and Wildlife Service 2009). Good riparian condition would likely be achieved in most areas that are not heavily impacted by wild ungulates. Healthy stands of sedges and rushes would have the opportunity to increase in density and vigor, although grazing by elk could still be detrimental.

Indirect effects to downstream Apache trout from livestock grazing are expected to be discountable with the expected improvements to riparian and upland conditions both in the short term and long term. Indirect effects to downstream Apache trout from livestock grazing can include maintenance of elevated levels of sedimentation within the drainages resulting from mechanical impacts to stream banks and grazing impacts to riparian and upland vegetation. Increased sedimentation can degrade water quality and alter physical parameters of aquatic habitat for these species. Although levels of sedimentation are expected to be above those found in the absence of livestock, livestock management on the allotment is expected to produce good riparian and improved upland conditions resulting in no measurable effects to species of concern.

Riparian areas are critical areas on both allotments. Where the potential exists, the Forest will maintain stubble heights of herbaceous vegetation at the green line of streamside perennial vegetation (6 inches for streams and in hydrophilic vegetation in wetlands in satisfactory condition; 8 inches if less than satisfactory). On Greens Peak these areas include: North Spring, Udall Draw Spring and Sherlock Draw areas, and streamcourses or wetlands currently in less than Proper Functioning Condition. On Hall Allotment, these areas include: Potato Patch, Vernon Creek, the riparian zone in the northern part of West CC pasture, and streamcourses or wetlands currently in less than Proper Functioning Condition. If improvements in riparian areas cannot be achieved through timing of grazing, season of use or adjustments in numbers, then adaptive management options can be implemented to assist with meeting desired conditions. See proposed action for description of specific adaptive management actions. Most of these options are designed to get better livestock distribution and less concentration of use in the riparian bottoms.

The existing HCI of 43.6% (60% is considered satisfactory) in Mineral Creek would likely improve with the implementation of Alternative 2, although improvements would be quicker under Alternative 1. One way the HCI value could be improved would be by the reduction in fine sediment deposition in the creek that originates from within the watershed. The proposed livestock management strategy should reduce indirect effects to Apache trout to a discountable level by limiting sediment contribution to stream habitats from both riparian and uplands. The presence of at least two tanks in Udall Draw on Hall Allotment will further assist with reductions in sediment transport to downstream Mineral Creek. Monitoring described in the Monitoring Plan found in Appendix A, will document improvements or declines in riparian and watershed conditions from which management adjustments can be made in order to achieve desired conditions.

Cumulative Effects to Apache Trout

Cumulatively, this alternative adds no appreciable adverse impacts to species of concern within the action area. Livestock grazing management on these allotments will achieve or maintain good riparian conditions which limit sediment movement into downstream habitats.

Nonetheless, aquatic species and their habitats are affected by past and present management activities as well as natural events in the action area. Most of these types of activities increase watershed erosion rates which can have adverse effects to aquatic species of concern. Future foreseeable activities include those described for Little Colorado spinedace cumulative effects analysis. Cumulatively, livestock grazing on the allotments when considered with Wallow Fire effects would contribute negligible effects to the Apache Trout, due to the location of the allotments outside the Wallow Fire burn perimeter.

Non-Federal ongoing actions include: livestock grazing on state and private lands north of the allotment, off of the Forest; Red Hill residential subdivision activities such as home construction and road maintenance on the private parcel adjacent to Kitchen Springs pasture. There are no additional state, tribal or non-Federal actions that are reasonably certain to occur within the action area.

Over the short and long-term, cumulative sediment inputs from future foreseeable activities will occur but effects from implementation of this action are not expected to be at a level to measurably affect Apache trout.

Determination of Effects. Based on the above discussion, the proposed action may effect, but is not likely to adversely affect Apache trout.

Chiricahua Leopard Frog

Greens Peak, Hall and Cerro Trigo Allotments

Alternative 1- No Action Alternative

Direct and Indirect Effects

There will be no direct effects to the species or its proposed critical habitat with the implementation of this alternative since the species and its proposed critical habitat are not present on the allotment.

Indirect sedimentation effects to Chiricahua leopard frog from the proposed action will not occur. With the long-term removal of livestock from all pastures, conditions across the watershed, such as maintenance of groundcover and riparian condition should improve.

This alternative would have a greater potential for improving watershed conditions through increased groundcover more quickly, as compared to Alternative 2. This alternative would likely best meet the needs of aquatic and riparian associated species by expediting improvements to watershed, soils, and riparian recovery through removal of livestock grazing direct and indirect impacts to stream channels and upland watershed conditions by the removing all livestock impacts to aquatic habitats in the future.

Cumulative Effects to Chiricahua Leopard Frog and Proposed Critical Habitat

There will be no cumulative effects from this “No Action” alternative.

Determination of Effects. Based on the above discussion, in consideration with past, present and future foreseeable impacts, Alternative 1 may beneficially affect Chiricahua leopard frog. There will be no effect to proposed critical habitat.

Alternative 2- Proposed Action

Direct and Indirect Effects

With the implementation of the proposed action for each of the allotments, riparian and watershed conditions are expected to improve as described for Apache trout and Little Colorado spinedace.

Similar improvements are also expected for Cerro Trigo Allotment, although riparian habitats are more limited on the allotment.

Since Chiricahua leopard frogs are not found on the allotments or in the 5th HUC watersheds (Oso Draw, Big Hollow Wash, South Fork & Carnero Creek Little Colorado Headwaters, Upper North Fork White River), no direct effects to the species will occur with the implementation of this alternative. Indirect effects to the species are unlikely given the species distribution. The closest population occurs 20 miles from the Greens Peak Allotment.

Livestock grazing impacts to potential and suitable habitats in the action area can include maintenance of elevated levels of sediment within the drainages resulting from mechanical impacts to stream banks and grazing impacts to riparian and upland vegetation. Increased levels of sedimentation can degrade water quality and alter physical parameters of aquatic habitat for this species. Sediment alters primary productivity and fills interstitial spaces in streambed materials with fine particulates that impede water flow, reduce oxygen levels, restrict waste removal and reduce aquatic macroinvertebrate food supplies. Although sedimentation levels are expected to be above those found in the absence of livestock, management on the allotment is expected to produce good riparian sediment buffers and improved upland conditions resulting in no measurable sedimentation effects Chiricahua leopard frog.

With the implementation of this alternative, riparian areas in good condition should be maintained and areas with unsatisfactory conditions should improve to at least a functionally acceptable level. Good condition is defined as those areas rated as proper functioning condition (PFC). On Greens Peak, riparian areas of concern include several springs, wetlands and drainages. These include: Driveway Spring, Pipeline Spring, Burnt Mill Spring, Vernon Creek, Potato Patch, Upper Draw and several unnamed wetlands. Most of these areas currently exhibit unsatisfactory conditions and are rated as Functioning at Risk (FAR). With the implementation of the proposed action, good riparian condition would likely be achieved in most areas that are not heavily impacted by wild ungulates. Healthy stands of sedges and rushes would have the opportunity to increase in density and vigor, although grazing by elk could still be detrimental.

Riparian areas are critical areas on all allotments. Where the potential exists, we will maintain stubble heights of herbaceous vegetation at the green line of streamside perennial vegetation (6 inches for streams and in hydrophilic vegetation in wetlands in satisfactory condition; 8 inches if less than satisfactory). On Cerro Trigo, riparian areas of concern include: (Kitchen Spring, Atascacita Spring), and streamcourses or wetlands currently in less than Proper Functioning Condition) having substantially met PFC. Riparian areas of concern for Greens Peak and Hall Allotments were described in the Apache trout section of the BAE. Cattle can remove bankline vegetation that provides escape cover for frogs and a source of insect prey. However, dense shoreline or emergent vegetation in the absence of grazing may favor some predators so some open areas are desirable. The proposed livestock management strategy should reduce adverse impacts to Chiricahua leopard frog habitats by increasing cover in these riparian areas and lowering erosion rates across the watershed from present levels. Monitoring as described in Appendix A will document riparian/watershed improvements. Livestock grazing on the allotment should not preclude the use of potential or suitable habitat in stock tanks by the species.

Since it is unlikely that the species is present in the action area, potential effects to Chiricahua leopard frog in the action area are to be insignificant. Also, effects to potential or suitable habitats are not expected to preclude occupancy of these habitats by Chiricahua leopard frog now or in the future.

This alternative has potential for restoration of the riparian areas at a slower rate as compared to Alternative 1. Nonetheless, riparian is expected to improve where possible to at least satisfactory condition. Potential Chiricahua leopard frog habitat on the allotment will benefit with improved

riparian conditions. Satisfactory riparian condition combined with improvements to upland watershed condition will minimize adverse effects to species of concern and their critical habitats.

Cumulative Effects to Chiricahua Leopard Frog

Cumulatively, this alternative adds no appreciable adverse impacts to species of concern within the action area. Livestock grazing management on these allotments will achieve or maintain good riparian conditions which limit sediment movement into downstream habitats.

Nonetheless, aquatic species and their habitats are affected by past and present management activities as well as natural events in the action area. Most of these types of activities increase watershed erosion rates which can have adverse effects to aquatic species of concern. Future foreseeable activities by the U.S. Forest Service include those described for Little Colorado spinedace cumulative effects analysis. Cumulatively, livestock grazing on the allotments when considered with Wallow Fire effects would contribute negligible effects to the Chiricahua Leopard Frog due to the location of the allotments outside the Wallow Fire burn perimeter.

Non-Federal ongoing actions include: livestock grazing on state and private lands north and south of the allotments, off of the Forest; Red Hill residential subdivision activities such as home construction; road maintenance on the private parcel adjacent to Kitchen Springs pasture; water withdrawals from Fish and Carnero Creek; water impoundment at the Greer Lakes in the LCR. Water impoundment and removal from drainages and springs in the action area will affect the amount of habitat that is available to Chiricahua leopard frog. There are no additional state, tribal or non-Federal actions that are reasonably certain to occur within the action area.

Over the short term and long term, cumulative sediment inputs from future foreseeable activities will occur but effects from implementation of this action is not expected to be at a level to measurably affect Chiricahua leopard frog or the suitability of habitats within the action area.

Determination of Effects. Based on the above discussion, the proposed action may effect, but is not likely to adversely affect Chiricahua leopard frog. There will be no effect to proposed critical habitat.

Little Colorado Sucker and Bluehead Sucker

Greens Peak

Alternative 1- No Action Alternative

Direct and Indirect Effects

There will be no direct effects to the three species with the implementation of this alternative since these species are not present on the allotment. Indirect sedimentation effects to occupied or potential/suitable habitats will not occur under this alternative.

Indirect effects to these species are the same as described for Little Colorado spinedace and will be discountable. With the long-term removal of livestock from all pastures, conditions across the watershed, such as maintenance of groundcover and riparian should improve the quickest as compared to Alternative 2.

Cumulative Effects to Little Colorado Sucker and Bluehead Sucker

There will be no cumulative effects from this “No Action” alternative.

Determination of Effects. Based on the above discussion, in consideration with past, present and future foreseeable impacts, the proposed action will have a beneficial impact on Little Colorado Sucker or Bluehead Sucker.

Alternative 2- Proposed Action

Direct and Indirect Effects

There will be no direct effects to these species with the implementation of this alternative since they are not present on the allotment.

Indirect sedimentation effects to these species are the same as described for Little Colorado spinedace and will be discountable. With the implementation of this alternative, riparian and watershed conditions are expected to improve as described for Little Colorado spinedace for Alternative 2. Measurable impacts to the species downstream or potential/suitable habitat are unlikely based upon proposed livestock management season and frequency of use. With the implementation of this alternative, measurable indirect impacts to Little Colorado sucker or bluehead sucker are not expected to occur. This alternative should maintain current watershed conditions through continuation of groundcover to the greatest extent possible with the current tree density and herbaceous species composition.

Riparian areas are critical areas on the allotment. Where the potential exists, we will maintain stubble heights of herbaceous vegetation at the green line of streamside perennial vegetation (6 inches for streams and in hydrophilic vegetation in wetlands in satisfactory condition; 8 inches if less than satisfactory).

This alternative has potential for restoration of watershed conditions including riparian areas at a slower rate as compared to Alternative 1. The proposed livestock management strategy should reduce indirect effects to Little Colorado sucker and bluehead sucker to a level that does not affect species viability by limiting sediment contribution to the Little Colorado River. The proposed action may impact individuals but is not likely to result in a trend toward federal listing or loss of species viability.

Cumulative Effects to Little Colorado Sucker and Bluehead Sucker

With the implementation of this alternative, no measurable adverse cumulative effects to aquatic species are expected. Nonetheless, aquatic species and their habitats are affected by past and present management activities in the action area as described for Little Colorado spinedace. Cumulatively, livestock grazing on the allotments when considered with Wallow Fire effects would contribute negligible effects to the Little Colorado Sucker and Bluehead Sucker due to the location of the allotments outside the Wallow Fire burn perimeter.

Water withdrawals from both Fish and Carnero Creek will continue by state & private water rights holders. Water impoundment and removal from drainages in the action area will affect the amount of habitat that is available to Little Colorado sucker and bluehead sucker in the LCR. There are no additional state, tribal or non-Federal actions that are reasonably certain to occur within the action area.

Over the and long-term, cumulative sediment inputs from future foreseeable activities will occur but effects from implementation of this action is not expected to be at a level to measurably affect aquatic species or the suitability of habitats within the action area.

Determination of Effects. Based on the above discussion, in consideration with past, present and future foreseeable impacts, the proposed action may impact individuals but is not likely to result in a trend toward federal listing or loss of species' viability for Little Colorado sucker or Bluehead sucker.

Arizona Toad and Northern Leopard Frog

Greens Peak, Hall and Cerro Trigo Allotments

Alternative 1- No Action Alternative

Direct and Indirect Effects

There will be no direct effects to Arizona toad and Northern leopard frog with the implementation of this alternative since these species are not present on the allotment. Indirect sedimentation effects to potential or suitable habitats will not occur under this alternative.

Indirect sedimentation effects to these species are the same as described for Chiricahua leopard frog and will be discountable. Impacts to riparian habitats are also the same as described for Chiricahua leopard frog. With the long-term removal of livestock from all pastures, conditions across the watershed, such as maintenance of groundcover, should improve quickest as compared to Alternative 2.

Cumulative Effects to Arizona Toad and Northern Leopard Frog

There will be no cumulative effects from this “No Action” alternative.

Determination of Effects. Based on the above discussion, in consideration with past, present and future foreseeable impacts, the proposed action will have a beneficial impact on Arizona toad and Northern leopard frog.

Alternative 2- Proposed Action

Direct and Indirect Effects

Direct effects to the species could occur since both species may be present in the action area, although given the species’ known distribution; it is unlikely that either amphibian are present in the action area. Nonetheless, if present, direct effects would include displacement of individuals as disturbance occurs or from trampling of individuals.

Indirect sediment effects to these species are the same as described for Chiricahua leopard frog and will be discountable. Impacts to stock tanks and riparian habitats are also the same as described for Chiricahua leopard frog. With the implementation of this alternative, riparian and watershed conditions are expected to improve as described for Chiricahua leopard frog on Greens peak Allotment.

This alternative has potential for restoration of watershed conditions including riparian areas at a slower rate as compared to Alternative 1. Proposed livestock management will prevent measurable indirect impacts to perennial habitats in the action area with improved riparian conditions. If present on the allotment, species may be impacted by livestock on the allotments through direct disturbance or trampling. Indirect impacts to the species related to livestock generated erosion are not likely to measurably affect the species given the extent of livestock impacts which includes limited time spent in each pasture and the retention of stubble heights adjacent to perennial habitats.

Cumulative Effects to Arizona toad and Northern Leopard Frog

With the implementation of this alternative, no measurable adverse cumulative effects to Arizona toad and Northern leopard frog are expected. Nonetheless, semi-aquatic species habitats are affected by past and present management activities in the action area as described for Chiricahua leopard frog.

Over the short and long-term, cumulative sediment inputs from future foreseeable activities will occur but effects from implementation of this action is not expected to be at a level to measurably affect semi-aquatic species potential or suitable habitats within the action area. Cumulatively,

livestock grazing on the allotments when considered with Wallow Fire effects would contribute negligible effects to the Arizona toad and Northern Leopard Frog due to the location of the allotments outside the Wallow Fire burn perimeter.

Determination of Effects. Based on the above discussion, in consideration with past, present and future foreseeable impacts, the proposed action may impact individuals but not likely to result in a trend toward federal listing or loss of species' viability for Arizona toad or Northern leopard frog.

Mexican Garter Snake and Narrow-headed Garter Snake

Greens Peak, Hall and Cerro Trigo Allotments

Alternative 1- No Action Alternative

Direct and Indirect Effects

There will be no direct effects to Mexican garter snake and narrow-headed garter snake with the implementation of this alternative. Indirect sedimentation effects to potential or suitable habitats will not occur under this alternative.

Indirect effects to these species are the same as described for Chiricahua leopard frog and will be discountable. With the long-term removal of livestock from all pastures, conditions across the watershed, such as maintenance of groundcover and riparian vegetation, should improve the quickest as compared to Alternative 2.

Cumulative Effects to Mexican Garter Snake and Narrow-headed Garter Snake

There will be no cumulative effects from this “No Action” alternative.

Determination of Effects. Based on the above discussion, in consideration with past, present and future foreseeable impacts, the proposed action will have a beneficial impact on Mexican garter snake and Narrow-headed garter snake.

Alternative 2- Proposed Action

Direct and Indirect Effects

Direct effects to the species could occur since both species may be present in the action area, although given the species' known distribution; it is unlikely that either reptile are present in the action area. Nonetheless, if present, direct effects would include displacement of individuals as disturbance occurs or from trampling of individuals.

Indirect effects to species' potential and suitable habitats are the same as described for Chiricahua leopard frog and will be discountable. It should be noted that potential or suitable habitat for the narrow-headed garter snake does not occur on Cerro Trigo Allotment. Impacts to stock tanks and riparian habitats are also the same as described for Chiricahua leopard frog. Proposed livestock management will prevent measurable indirect impacts to species and habitat downstream with improved riparian and watershed conditions. Indirect impacts to the species related to livestock generated erosion are not likely to measurably effect the species given the magnitude of livestock impacts. If present on the allotment, species may be impacted by livestock on the allotments through indirect disturbance or habitat modification through forage utilization. With the implementation of this alternative, riparian and watershed conditions are expected to improve as described for Chiricahua leopard frog.

This alternative has potential for restoration of the riparian areas at a slower rate as compared to Alternative 1. Proposed livestock management will prevent significant indirect impacts to suitable

or potential habitat with management designed to improve riparian and watershed conditions. Proposed riparian vegetation stubble retention should provide for good bank vegetation, important to the species. In areas of unsatisfactory riparian condition (FAR), an 8 inch stubble height of herbaceous vegetation at the green line will be maintained over winter. In areas rated as satisfactory, 6 inch overwinter stubble will be left to dissipate flow energies during spring runoff and to otherwise protect soil surfaces from excessive erosion. Although riparian vegetation may not be at its full potential with the implementation of the proposed action, it should be in sufficient quantity to provide for good riparian habitat.

Cumulative Effects to Mexican Garter Snake and Narrow-headed Garter Snake

With the implementation of this alternative, no measurable adverse cumulative effects to aquatic species are expected. Nonetheless, aquatic species and their habitats are affected by past and present management activities in the action area as described for Chiricahua leopard frog.

Over the short and long-term, cumulative sediment inputs from future foreseeable activities will occur but effects from implementation of this action is not expected to be at a level to measurably affect suitability of semi-aquatic species' potential or suitable habitats within the action area. Cumulatively, livestock grazing on the allotments when considered with Wallow Fire effects would contribute negligible effects to the Mexican Garter Snake and Narrow-headed Garter Snake due to the location of the allotments outside the Wallow Fire burn perimeter.

Determination of Effects. Based on the above discussion, in consideration with past, present and future foreseeable impacts, the proposed action may impact individuals but not likely to result in a trend toward federal listing or loss of species viability for the Mexican garter snake and the narrow-headed garter snake.

Arizona Snaketail, Ferris' Copper, Four Spotted Skipperling, Nokomis Fritillary, Nitocris Fritillary

Greens Peak, Hall and Cerro Trigo Allotments

Alternative 1- No Action Alternative

Direct and Indirect Effects

There will be no direct effects to Arizona snaketail, Ferris' copper, four spotted skipperling, nokomis fritillary or nitocris fritillary with the implementation of this alternative. It should be noted that Arizona snaketail is not present on Cero Trigo Allotment due to the lack of perennial streams in the action area.

No direct effects to riparian habitats will occur. With the long-term removal of livestock from all pastures, conditions across the watershed, such as maintenance of groundcover and riparian vegetation, should improve the quickest as compared to Alternative 2.

Cumulative Effects to Arizona Snaketail, Ferris' Copper, Four Spotted Skipperling, Nokomis Fritillary, Nitocris Fritillary

There will be no cumulative effects from this "No Action" alternative.

Determination of Effects. Based on the above discussion, in consideration with past, present and future foreseeable impacts, the proposed action will have a beneficial impact on Arizona Snaketail, Ferris' Copper, Four Spotted Skipperling, Nokomis Fritillary and Nitocris Fritillary.

Alternative 2- Proposed Action

Direct and Indirect Effects

There could be direct effects to these insect species with the implementation of this alternative since these species could be present on the allotment. Direct effects would include displacement of individuals as disturbance occurs or from trampling of individuals.

With the implementation of this alternative, riparian and watershed conditions are expected to improve as described for Chiricahua leopard frog. Indirect effects to species' potential and suitable riparian habitats are the same as described for Chiricahua leopard frog and will be discountable.

If present on the allotment, implementation of the proposed action could result in indirect impacts such as trampling of or grazing of food plants as livestock utilize the allotment. Although proposed livestock management will prevent significant impacts to species and habitat, indirect effects to the four spotted skipperling could occur with the reduction in grasses or flowering annuals through livestock consumption. Since rumex may be found in riparian areas on the allotment, Ferris copper and its suitable habitat could be impacted by livestock grazing on rumex or trampling of plants. The extent of these impacts is not expected to affect Arizona snaketail, Ferris' copper, four spotted skipperling, nokomis fritillary or nitocris fritillary species viability. This is due to the limited extent of livestock impacts which includes limited time spent in each pasture and the reduced impacts to riparian habitats from implementation of the proposed action.

This alternative has potential for restoration of the riparian areas at a slower rate as compared to Alternative 1. Proposed livestock management will prevent measurable indirect impacts to perennial habitats in the action area with improved riparian conditions. With the implementation of this alternative, riparian and watershed conditions are expected to improve as described for Chiricahua leopard frog. If present on the allotment, all species may be impacted by livestock on the allotments through direct disturbance or trampling. Indirect impacts to the species related to livestock generated erosion are not likely to measurably affect the species given the extent of livestock impacts which includes limited time spent in each pasture and the retention of stubble heights adjacent to perennial habitats.

Cumulative Effects to Arizona Snaketail, Ferris' Copper, Four Spotted Skipperling, Nokomis Fritillary, Nitocris Fritillary

With the implementation of this alternative, no measurable adverse cumulative effects to Arizona snaketail, Ferris' copper, four spotted skipperling, nokomis fritillary and nitocris fritillary are expected. Nonetheless, these semi-aquatic species and their riparian habitats are affected by past and present management activities in the action area as described for Chiricahua leopard frog. Over the short and long-term, cumulative riparian impacts from future foreseeable activities will occur but effects from implementation of this action is not expected to be at a level to measurably affect the semi-aquatic species or the suitability of habitats within the action area. Cumulatively, livestock grazing on the allotments when considered with Wallow Fire effects would contribute negligible effects to the Arizona Snaketail, Ferris' Copper, Four Spotted Skipperling, Nokomis Fritillary, and Nitocris Fritillary due to the allotments location outside the Wallow Fire burn perimeter.

Determination of Effects. The proposed action may impact individuals but is not likely to result in a trend toward federal listing or loss of species viability for Arizona snaketail, Ferris' copper, four spotted skipperling, nokomis fritillary and nitocris fritillary.

Management Indicator Species

Project level Existing Conditions

The Wallow fire did not occur on the Hall, Greens Peak or Cerro Trigo Allotments. There are 916 riparian acres, or <2% of the total riparian acres on the Forest(s), in all three allotments combined. Of the total riparian areas on the allotments, 85 acres occur on Cerro Trigo Allotment; 269 acres occur on Greens Peak Allotment; and 562 acres occur on Hall Allotment. All of the riparian acres on Hall and Cerro Trigo Allotments are associated with springs, wetlands and cienegas which would not generally support populations of aquatic macroinvertebrates. None of the riparian acres on these two allotments are associated with perennial streams or lakes which have sufficient surface water to support diverse aquatic macroinvertebrate populations. Of the 269 total riparian acres on Greens Peak Allotment, there are 118 acres that are associated with a perennial drainage, Carnero Creek. Carnero Creek riparian represents 0.2% of the total riparian acres on the Forest(s). In addition, Hall Allotment also has Carnero Lake which also provides sufficient habitat for aquatic macroinvertebrates. No aquatic macroinvertebrate surveys have been conducted in Carnero Creek or in Carnero Lake.

On Greens Peak Allotment, riparian areas of concern include several springs, wetlands and drainages. These include: Driveway Spring, Pipeline Spring, Burnt Mill Spring, Vernon Creek, Potato Patch, Upper Draw and several unnamed wetlands. Most of these areas currently exhibit unsatisfactory conditions and are rated as Functioning at Risk (FAR). On Greens Peak, riparian areas of concern include several springs, wetlands and drainages. These include: Swinborn Spring, North Spring and Carnero Lake, Carnero Spring and Carnero Creek. Most of these areas currently exhibit satisfactory conditions and are rated as proper functioning condition (PFC). On Cerro Trigo, riparian areas of concern include several springs: Kitchen, Little Giant, Atascacita, Mallory, Pipeline, Fran Day, Driveway Hall and several unnamed springs. Most of these areas currently exhibit PFC.

Greens Peak Allotment Aquatic Macroinvertebrates

Management indicator species (MIS) are those species that represent a particular suite of species, which utilize habitat niches and elements in similar ways. Therefore, if a MIS is predicted to be positively or adversely impacted by a particular land management activity, it is assumed that other species sharing those same habitat needs will be similarly impacted.

Aquatic macroinvertebrates are identified in the Apache-Sitgreaves National Forest(s) Plan (FLMP) as a management indicator group (MIS) for riparian habitat (MA-03) found on the Forests since these species are generally found in perennial habitats that are associated with riparian habitats. Groups or species of aquatic macroinvertebrates are classified by habitat types, feeding preferences, and pollution tolerances. These organisms can detect changes in water quality, stream temperatures, and substrate composition and their composition in an aquatic system change in response to changes in their environment. This sensitivity makes them a useful management tool for monitoring stream (and riparian) habitats. As a group, aquatic macroinvertebrates are generally larger than 0.5 mm, lack a backbone and require an aqueous environment to persist.

Riparian habitats are important to aquatic macroinvertebrates for several reasons including: providing organic material as a food source in forested headwater streams, providing cover and shade for cool water temperatures, as well as for providing dense vegetation to hold streambanks together. Of the 18 miles of streams on the allotment, approximately 3 miles (Carnero drainage)

are perennial. The 65-100 acre Carnero Lake also occurs on the allotment and also provides habitat for macroinvertebrates. Perennial streams and lakes in the action area that likely contain aquatic macroinvertebrates include Mineral Creek, Fish Creek and Carnero Creek and Norton Reservoir.

Within the *action* area there were two macroinvertebrate samples collected from Mineral Creek. The results of from these surveys are summarized below in Table 23:

Table 23. Macroinvertebrate Analysis Results for Mineral Creek.

Station	Sampling Date	BCI/Rating
2	11/86	81/Good
3	11/86	85/Good

Both 1986 samples meet Forest Plan standards and although no current data is available, some beneficial habitat changes have occurred within Mineral Creek since 1986 including a decrease in substrate embeddedness, which would likely have resulted in maintenance or improvement of the 1986 BCI indices.

The Forest Level Macroinvertebrate Summary (2005) provides an updated Forest level analysis of aquatic macroinvertebrates, including a discussion of Forest Plan Standards and Guidelines. The standards and guidelines for aquatic macroinvertebrates are to manage for and maintain at least an 80 % Biotic Condition Index (BCI) on all perennial streams. The Fisheries and Riparian Habitat Improvement for the Apache-Sitgreaves National Forests Implementation Plan (Forest Riparian Plan) provides the rationale and methods to be used and is discussed in the 2005 Summary.

The BCI score indicates as a percentage how close an aquatic ecosystem is to its own potential. Currently, there is insufficient information available to document actual Forest-wide trends in populations or habitats based upon BCI indices. Most streams have not had multiple year samples analyzed and therefore comparisons of BCI indices over time cannot be done. Many years and seasons of sampling are needed to identify the natural variability of population numbers within local aquatic macroinvertebrate communities before trends can actually be determined. Nonetheless, when all available riparian and aquatic habitat data is considered at the Forest level, trends in macroinvertebrate populations and habitats are *estimated* to be downward on 70% of the cold water streams on the Forests. For a full discussion of aquatic MIS species habitats, population trends, and related ASNFs actions see the Forest Level MIS analysis (2005).

Table 24 below summarizes all 35 of the streams sampled across the Forests. Seven (20%) of the streams did not have a BCI calculated, and a total of 28 (80%) streams had the BCI calculated at 156 sites. Three streams (9%) of the samples collected were meeting LRMP standards, 13 (37%) were not meeting LRMP standards, and 12 streams (34%) had mixed results (i.e., some reaches were meeting and some were not). rated good, and 42 (27%) rated excellent. Both good and excellent ratings are at a 80 BCI or above, and are considered meeting Forest Plan standards. Those sites meeting or exceeding Forest Plan standards comprised 34% of the total, and those sites not meeting Forest Plan standards occurred at 66% of the sampled locations.

Table 24. Macroinvertebrate data collected on the Apache-Sitgreaves National Forests from 1986 through 2002. Summarized by streams that are meeting, not meeting, or have mixed results for the Biological Condition Index (BCI) rating.

Stream	# of streams	% of total	% of streams with BCI data
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Streams meeting LRMP standard	3	9	11
Streams not meeting LRMP standard	13	37	46
Streams with mixed results	12	34	43
Streams with no BCI calculated	7	20	0

Udall Draw and Mineral Creek

See description for Mineral Creek in Hall Allotment existing conditions, with the exception: that less than one mile of the uppermost portion of Udall Draw occurs on the allotment. The remaining sections of Udall Draw and Mineral Creek described for Hall Allotment occur in the action area.

Norton Reservoir Draw and Fish Creek

Perennial portions of Norton Reservoir Draw and Fish Creek occur within the action area. The intermittent headwaters of Norton Reservoir Draw, a tributary to Fish Creek, occur on the allotment. Less than 1.5 miles of the uppermost portion of Norton Draw occurs on the allotment. From the allotment boundary it is an estimated 2 miles downstream to Norton Reservoir and another .25 miles downstream to Norton Draw's confluence with Fish Creek. Field observations made by Springerville RD in 1992 for the Beehive Timber Sale (USFS unpublished report 1992) indicate speckled dace were present in Norton Reservoir Draw, below the reservoir and in Fish Creek above the confluence with Norton Creek Draw. Norton Reservoir Draw was noted as intermittent above the reservoir and perennial below Norton dam if the headgate is kept open enough. Overall drainage channel conditions were noted as good and stable with a few areas impacted by ungulate use resulting in unstable banks.

From the confluence of Norton Draw with Fish Creek; it is an estimated 2.5 miles downstream to the water diversion structures in Fish Creek. It appears that during low to normal water years a significant percentage of the total streamflow is diverted into the Fish Creek Ditch system to be utilized further downstream on private lands. Briggs (2004) measured flow above the diversion structures at 1.75 cfs. Visual observations and fish sampling of upper Fish Creek has occurred by District biologist since 2001. It has been noted by the District Fisheries Biologist that flows are significantly reduced in Fish Creek below the diversion with the channel becoming dry above the FR 118 crossing during previous summer field reviews. Upper Fish Creek in the vicinity of SH 260 is perennial and contains speckled dace. The portion of Fish Creek below the allotment is estimated to be perennial for up to three miles and likely could support speckled dace. Overall channel conditions were noted as good in the canyon reaches below the confluence with Norton Reservoir Draw but channel instability is present in some of the meadow reaches.

Carnero Creek

Occurs within the allotment. All of Carnero Creek above the reservoir and less than ½ mile below the reservoir occurs on the allotment. The remaining sections of the Carnero Creek drainage system are within the action area.

Carnero Creek was noted as perennial above Carnero Lake (<1 mile in length) and intermittent below the lake (Young et al. 2001). The perennial portion of Carnero Creek originates at Carnero Spring where it is diverted away from its natural channel and into a ditch in order to fill Carnero Reservoir. The perennial portion of Carnero Creek could provide limited habitat for rainbow trout. The intermittent portion of Carnero Creek was described by Briggs (2004) and includes both natural channel and manmade ditch sections: The Carnero Creek ditch system begins at Carnero reservoir and from the reservoir outlet, water flows approximately 0.16 miles in a manmade drainage to reach the natural drainage of Carnero Creek. Water flows in the natural

drainage of Carnero Creek for approximately 1.7 miles until reaching a permanent earthen diversion structure in the Carnero Creek Channel that diverts all flows into the manmade Carnero Creek Ditch (Briggs 2004). All flows in the Carnero Creek Drainage and Ditch system that originate on National Forest land are diverted downstream to private lands for use.

Carnero Lake

Occurs within the allotment. This 65-100 acre cold water reservoir was historically stocked from 1979-1981 with rainbow and brown trout. Current AZGFD management emphasis for Carnero Lake is for a blue ribbon sportfish fishery (Young et al. 2001). With the recent acquisition of the majority of water storage rights in the reservoir, resumed stocking of 5000- 8000 rainbow trout has occurred annually since 2003. Angler use has yet to be documented. Occasional winterkills have been documented in this shallow eutrophic lake (Dave Dorum (AZGFD) personal communication).

Hall Allotment Aquatic Macroinvertebrates

Of the 30 miles of streams in the project area, none are perennial. Perennial streams in the action area that likely contain aquatic macroinvertebrates include 4 miles of Mineral Creek located three miles downstream from the allotment boundary.

Within the *action* area there were two macroinvertebrate samples collected from Mineral Creek. The results of from these surveys are summarized in Table 23 within the macroinvertebrate discussion for Greens Peak Allotment. Forest-wide trends for macroinvertebrates are also discussed for Greens Peak Allotment and are relevant for Hall Allotment.

Udall Draw and Mineral Creek

Mineral Creek occurs within the action area. The intermittent headwaters of Udall Draw, a tributary to Mineral Creek, occur on the allotment.

Approximately 3.5 miles of Udall Draw are found on the allotment. In the vicinity of FR 61, this drainage is not well defined and flows thorough what used to be a wet meadow that looks heavily utilized by undulates with soil compaction and high forage utilization evident. A series of tanks are distributed in this large meadow area to capture surface flow. Farther down channel in the vicinity of Sawmill springs, a few small headcuts are moving up the defined drainage in this section of meadow. Again, soil compaction and high forage utilization are evident. Willow skeletons are present in this area indicating that this meadow may have been a wetter site in the past.

Within Mineral Creek, the perennial stream reaches flow through A-SNFs administered lands at elevations ranging from 8520 ft. at Mineral Springs to 7,600 ft. near the Forest boundary. Fish habitat occurs from Mineral Springs downstream for approximately four miles to just south of the Forest boundary. At this point, immediately below the fish migration barrier, flow is diverted into an irrigation ditch for use on private land. The only documented species within this drainage is Apache trout.

A search of District survey records indicate that the perennial reaches of Mineral Creek were surveyed in 1986, 1991, 2001, and 2003 by the Arizona Department of Game and Fish and in 1996 by the U.S. Forest Service (Springerville RD records) utilizing GAWS survey methodologies. The 2003 survey results are summarized below (Table 25). All of the surveyed reach miles are downstream from the allotment boundary.

Table 25. Habitat Conditions from Mineral Creek 2003.
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	Forest Plan Standard (satisfactory condition)	Reach 1 (3301 m)	Reach 2 (925 m)	Reach 3 (786 m)	Stream Average
HCI %	≥ 60	47.9	38.4	41.0	43.6
Streambank Soil/Vegetation Stability %*	> 80	68.1	68.8	66.3	67.7
Substrate Embeddedness %	< 20	10.9	32.0	36.0	23.0
Riparian Condition	> 9	10	8	11	10

* Average of bank soil stability and bank vegetation stability ratings.

Based upon the 2003 survey results, the average ratings for all reaches do not meet Forest Plan standards and guidelines except for riparian condition which is satisfactory overall. Streambank soil and vegetative stability ratings are measures of the effectiveness of soil and vegetative conditions in compensating for erosive forces. Substrate embeddedness ratings estimate how much surface area of large substrate particles are covered by fine sediments and can indicate the degree of upstream erosion occurring. Both streambank soil/vegetative stability and substrate embeddedness average ratings do not meet Forest plan standards. HCI ratings measure existing trout habitat quality by factoring in pool habitat, bank stability and spawning gravel measurements. The low HCI ratings in Mineral Creek were predominately due to the near absence of pool habitat. Average ratings are improved from 1986 conditions seen in Table 26, below.

	Forest Plan Standard (satisfactory condition)	Reach 1 (3301 m)	Reach 2 (925 m)	Reach 3 (786 m)	Stream Average
HCI %	≥ 60	53.8	23.9	13.5	36.1
Streambank Soil/Vegetation Stability %*	> 80	56.9	19.7	12.5	29.7
Substrate Embeddedness %	< 20	68.0	85.7	91.4	78.4
Riparian Condition	> 9	6.5	7	7	6.8

* Average of bank soil stability and bank vegetation stability ratings.

It should be noted that in the 1980's the Mineral Creek livestock enclosure was completed which excluded livestock from all sections of the drainage south of FR404 and from the fish barrier upstream for 0.6 miles. By the mid 1990's the remaining one mile of drainage open to livestock was also excluded from planned grazing. The entire perennial portion of Mineral Creek above the fish barrier has been excluded from livestock grazing since 1996 which has enabled this stream to move toward meeting Forest Plan standards. The 1986 GAWS survey indicated high levels of bank damage caused by ungulates while the 2003 survey noted very minor impacts.

Although the above ratings have improved for Mineral Creek, it still has not reached its potential for providing quality fish habitat. Quality pools are an essential habitat component for this system that is nearly absent. Stream flows have been significantly reduced by drought conditions seen since the early 2000's affecting all available habitats. The channel is braided along portions of its length even further limiting fish sustaining habitat and the resulting resident fish population is estimated to be low.

Cerro Trigo Allotment Aquatic Macroinvertebrates

Of the 5 miles of streams in the project area, none are perennial. No perennial streams occur in the action area. Within the action area no macroinvertebrate samples were collected. There are no perennial streams in the action area. Forest-wide trends for macroinvertebrates for Cerro Trigo Allotment are the same as were discussed for Greens Peak Allotment. A few stock tanks present in the project area. These aquatic habitats are not capable of supporting fish, clams or snails but could potentially provide habitat for amphibians, reptiles and some insects.

Environmental Consequences MIS

Greens Peak, Hall and Cerro Trigo Allotments

Alternative 1-No Action Alternative

Direct and Indirect Effects

Riparian habitat will not be affected by livestock grazing on Greens Peak, Hall and Cerro Trigo Allotments. No livestock grazing will occur. With the long-term removal of livestock from all pastures, riparian condition should improve the quickest as compared to Alternative 2.

Cumulative Effects to Aquatic Macroinvertebrates

There will be no cumulative effects from this "No Action" alternative.

Determination of Effects. Forest-wide trends in macroinvertebrate populations are estimated to be downward on 70% of the cold water streams on the Forests. Based upon the "no action" project effect to the Forest-wide trend for riparian habitat, implementation of Alternative 1 will contribute no effect to the Forest-wide aquatic macroinvertebrate population trend.

Alternative 2

Direct and Indirect Effects

Riparian areas are critical areas on all three, especially Greens Peak and Hall Allotment. Very little riparian exists on Cerro Trigo Allotment. Where the potential exists, the Forest will maintain stubble heights of herbaceous vegetation at the green line of streamside perennial vegetation (6 inches for streams and in hydrophilic vegetation in wetlands in satisfactory

condition; 8 inches if less than satisfactory). On Greens Peak these areas include: North Spring, Udall Draw Spring and Sherlock Draw areas, and streamcourses or wetlands currently in less than Proper Functioning Condition. On Hall Allotment, these areas include: Potato Patch, Vernon Creek, the riparian zone in the northern part of West CC pasture, and streamcourses or wetlands currently in less than Proper Functioning Condition. If improvements in riparian areas cannot be achieved through timing of grazing, season of use or adjustments in numbers, then adaptive management options can be implemented to assist with meeting desired conditions. See proposed action for description of specific adaptive management actions. Most of these options are designed to get better livestock distribution and less concentration of use in the riparian bottoms. Riparian vegetation off of the allotment will not be directly or indirectly affected by the proposed action.

With the implementation of Alternative 2, riparian areas in good condition should be maintained and areas with unsatisfactory conditions should improve to at least a functionally acceptable level. Good condition is defined as those areas rated as proper functioning condition (PFC). On Greens Peak, riparian areas of concern include several springs, wetlands and drainages. These include: Driveway Spring, Pipeline Spring, Burnt Mill Spring, Vernon Creek, Potato Patch, Upper Draw and several unnamed wetlands. Most of these areas currently exhibit unsatisfactory conditions and are rated as Functioning at Risk (FAR). With the implementation of the proposed action, good riparian condition would likely be achieved in most areas that are not heavily impacted by wild ungulates. Healthy stands of sedges and rushes would have the opportunity to increase in density and vigor, although grazing by elk could still be detrimental.

This alternative has potential for restoration of the riparian areas at a slower rate as compared to Alternative 1. Nonetheless, riparian is expected to improve where possible to at least satisfactory condition. Riparian on the allotments includes: the 3 miles of perennial stream that occurs on the allotments encompasses <1% of the Forest-wide perennial stream miles (1000 acres); and the 100 acres of lake habitat on the allotments represents 1% of the Forest-wide lake habitat. Any potential changes to riparian habitats at the project level are not expected to be significant either in quantity or quality, and should not alter Forest-wide riparian habitat trends which were estimated to be downward. Any potential effects to riparian vegetation will be insignificant in its affects across the landscape.

In the short term and long-term, this project would have minimal impacts on forest-wide habitat or population trends for aquatic macroinvertebrates.

Cumulative Effects to Aquatic Macroinvertebrates

Cumulatively, this alternative adds no appreciable adverse impacts to riparian habitat in the action area. Livestock grazing management on these allotments will achieve or maintain good riparian conditions.

Nonetheless, riparian habitats are affected by past and present management activities as well as natural events in the action area. Future foreseeable activities by the U.S. Forest Service that may affect riparian habitats include those described for Little Colorado spinedace cumulative effects analysis. Cumulatively, livestock grazing on the allotments when considered with Wallow Fire effects would contribute negligible effects aquatic macroinvertebrates due to the location of the allotments outside the Wallow Fire burn perimeter.

Over both short term and long-term timeframes, some impacts to riparian habitats will occur with the implementation of the proposed action combined with the future foreseeable activities described above, but these impacts will not contribute measurable effects to the Forest-wide aquatic macroinvertebrate population trend .

Determination of Effects. Forest-wide trends in macroinvertebrate populations are estimated to be downward on 70% of the cold water streams on the Forests. Based upon the anticipated project effect to the Forest-wide trend for riparian habitat, implementation of Alternative 2 will contribute no measurable effect to the Forest-wide aquatic macroinvertebrate population trend, and is similar to Alternative 1 in its effects.

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 MEMBERS:

Name	Title	EA Contribution
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Weaver, Stacey	Cartographic Technician (GIS)	GIS support
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FEDERAL, STATE, AND LOCAL AGENCIES:

Federal

USDA National Resources Conservation Service

U. S. Army Corps of Engineers

U. S. Department of the Interior

U. S. Fish and Wildlife Service

State

Arizona Department of Environmental Quality

Arizona Department of Game and Fish

Arizona State Land Department

Local

Apache County Board of Supervisors

Little Colorado Natural Resources Conservation District

Town of Eagar

Town of Springerville

TRIBES:

Fort McDowell Yavapai Nation

Tonto Apache Tribe

The Hopi Tribe

White Mountain Apache Tribe

The Navajo Nation

Yavapai-Apache Nation of the Camp Verde Indian Reservation

Ramah Navaho Chapter

Yavapai-Prescott Tribe of the Yavapai Reservation

San Carlos Apache Tribe

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OTHERS:

Norman Brown/Norman and Karen Brown, allotment permittee and manager for J. Albert Brown Ranches, allotment permittee

Carey Dobson/Timberline Cattle Co., allotment permittee

Dale Hall/The Hall Revocable Trust, allotment permittee

Charles Waite/Charles and Susan Waite, allotment permittee

Dolores Salazar, allotment permittee

Chapter 5 – Appendices

Appendix A. – Monitoring Strategy

Introduction

The objective of this monitoring strategy for the Greens Peak, Hall and Cerro Trigo allotments is to identify monitoring methodologies and frequencies, to determine whether management is being implemented as envisioned in the chosen alternative, and whether the actions are effective at achieving or moving toward desired conditions.

Monitoring is a measure of indicators that detect change and may trigger further detailed analysis of a particular resource. Either monitoring or detailed analysis may trigger adaptive management options on the allotments on a seasonal basis or to verify changes needed in the Allotment Management Plan and term permit.

We need to acknowledge that there are environmental factors outside management control, such as multi-year droughts or large fires, which can overpower the effects of livestock management actions. The time frames of this strategy do not take such events into account. However, such events can take place and if so, need to be taken into account in analyzing the effects of management on the resources. Another major environmental factor affecting resource condition is the West-wide increase in tree canopy cover of almost every tree species. In these allotments it is most felt in historic grasslands being overtaken by juniper and ponderosa pines, and taking on the aspect of forests. This ongoing increase in tree cover outcompetes and replaces herbaceous and shrubby cover, and cannot be reversed by livestock management. Where TES map units envision potential vegetation communities being grasslands, and existing tree cover exceeds about 10 percent, only active tree reduction projects will open enough resources to effect movement towards increased similarity to the envisioned herbaceous density and composition. Such projects are not within the scope of this analysis and decision.

This strategy envisions that final details of monitoring locations, if not already established, will be established in a collaborative way with input from the district range personnel, the riparian coordinator and permittee(s). For instance, certain stream reaches have been identified by name in the analysis as being in less than Proper Functioning Condition. Selecting where along the identified reach to install permanent monitoring transects would be done as described above.

Tables are provided that give an overview of monitoring needs on the allotments, followed by narratives that explain planned monitoring in more detail.

Monitoring Definitions

Monitoring: Monitoring is defined as the orderly collection, analysis, and interpretation of resource data, to evaluate progress toward meeting management goals and objectives. This process must be conducted over time in order to determine whether or not management objectives are being met.

Implementation Monitoring: Determines whether standards and management practices are implemented as detailed in a Decision Document, Allotment Management Plan (AMP), or Annual Operating Instructions (AOI). This short-term monitoring answers the question: was the management implemented as designed? It annually documents several items. Items which may be documented through implementation monitoring include, but are not limited to: actual use

(livestock numbers and days), condition of range improvements, levels of forage utilization, stubble heights, etc.

Effectiveness Monitoring: Determines whether management practices are effective in moving the allotment toward a desired condition as described in the AMP. This long-term monitoring documents whether management actions are having the expected progress towards achieving resource management objectives. Examples include:

- 1) Evaluating changes in vegetation composition or soil cover (ecological status).
- 2) Tracking progress of specific PFC elements

Monitoring Summary

The following Tables 1 and 2 summarize the monitoring to be accomplished on the allotments.

Table 27: Summary of Monitoring by Allotment

Monitoring Item	Greens Peak Allotment	Hall	Cerro Trigo
Riparian obligate vegetation height*	annually	annually	annually
Ecological Status/Range Condition (trend, composition, soil cover)	Years 5 and 10	Years 5 and 10	Years 5 and 10
Riparian Condition / Key PFC Elements	Years 1, 5 and 10	Years 1, 5 and 10	Years 1, 5 and 10
Soil Condition	As Needed	As Needed	As Needed
Watershed / Soils Problem Areas	As Needed	As Needed	As Needed

* Yearly monitoring will occur in years when the allotments are stocked with livestock.

Table 28: Specific Monitoring Items: Who, What, When and Where

Monitoring Item:	Methods	Timing	Frequency (Interval, years)	Where	Critical Triggers	Lead Responsibility
Riparian Obligate Vegetation height	Residual vegetation (stubble height)	end of growing season and/or seasonal	Annually	Critical riparian areas – see table below for details	Sat: < 6” going into winter Unsat: < 8” going into winter	Range
Upland forage utilization	Various methods*	end of growing season	Annually	Key and critical upland	Percent utilized >10% above	Range

		and/or seasonal		areas, including goshawk habitat	allowable, in two consec. years	
Ecological Status/ Range Condition (trend, composition, ground cover)	Various methods*	late Summer	Year 5 & 10	Permanent transects – see range specialist report for locations. Paced transects, as determined necessary.	Decreased status compared to prior monitoring; no improvement in unsat. parameters (if tree canopy permits); Less than USLE tolerance thresholds conditions	Range
Assess Riparian condition / key PFC elements	Various method, such as documented in Multiple Indicators Monitoring, as needed to quantify aspects previously id'd in PFC as unsatisfactory	Mid Summer or Later	Unsat: year 1 & 5 & 10 Sat: year 10	Critical riparian areas – see table below for details	Downward trend or non-apparent trends if unsat.	Watershed
Soil Condition	Various methods*	Any	As Needed: Onset, yr 5 & 10	Critical Areas – see watershed specialist report for details	Downward or non-apparent trends	Watershed
Watershed/Soils Problem Areas	Field observation and/or inspection	Any	As Needed: Onset, yr 5 & 10	Gullies, headcuts, rills, wherever found	Non-apparent trend in unsat. areas, or downward trends	Range

*Available from Interagency Technical Guide, 1996, Region 3 Rangeland Analysis and Management Training Guide, Principles of Obtaining and Interpreting Utilization Data on Rangeland, 5/07, finalized Forest Service Handbook, and other acceptable methods.

Table 29: Minimum locations and parameters for riparian monitoring

Greens Peak	Hall	Cerro Trigo
<p>Carnero Springs - Yearly streambank residual veg min 6".</p>	<p>Potato Patch – Lentic wetland extent; lotic greenline to greenline stream width; lentic and lotic annual disturbance; lotic streambank stability; veg comparison to exclosure – all years 1, 5 and 10. Yearly streambank residual veg min 8". PFC assessments at years 5 and 10.</p>	<p>Lentic areas around Kitchen Springs - Yearly streambank residual veg min 6". PFC assessments at years 5 and 10.</p>
<p>Sherlock Draw Tank lentic zone - Yearly streambank residual veg min 8". PFC assessments at years 5 and 10.</p>	<p>Vernon Creek/CC Flat - Lentic wetland extent; lotic greenline to greenline stream width; lentic/lotic veg composition; lentic and lotic annual disturbance; lotic streambank stability – all years 1, 5 and 10. Yearly streambank residual veg min 8". PFC assessments at years 5 and 10.</p>	
	<p>Lentic within/near MSO PACs - Yearly streambank residual veg min 8".</p>	

Monitoring Strategy: Range Management

Implementation Monitoring -- Objective: Insure that the action(s) described in the Decision Document (EA) are implemented accordingly, as scheduled and are in compliance with the Forest Plan standards and guidelines.

Annual monitoring to adjust or evaluate the timing, intensity, frequency and season of use, and livestock numbers will be conducted during the grazing season (seasonal) and/or at the end of the growing season. These practices are part of adaptive management and make necessary management changes needed for range development and recovery.

Compliance with Annual Operating Instructions (AOI) – Each year’s AOI includes specific pasture rotations, livestock numbers to be grazed, pasture entry and exit dates, improvement maintenance and construction, and general annual allotment operating procedures. Monitoring involves allotment inspections, counting livestock on or off, and required permittee-provided documentation of accurate records of the number of livestock run on the allotment and entry and exit dates of each pasture grazed.

Range Readiness - Range readiness checks will be conducted in anticipation of livestock entry in seasons when spring growth is delayed. The main objective is to determine whether entry pastures are capable of being grazed and trampled without causing long term damage to the vegetation or soils.

1. Soil condition - The soil is firm, at or below field capacity.

Saturated soils are not present, shown by the reviewer being able to walk about without leaving depressions in the soil. Standing water and ponding from snowmelt are not present.

2. Vegetative development stage. With rest or deferment it may be possible to graze at earlier stages, however not on an annual basis. Rangeland is generally ready when cool-season grasses are headed out, forbs are in full bloom, and brush and aspen is leafed out. Range readiness dates will vary between allotments and pastures with different elevations and management systems.

Stubble Height –Monitoring of riparian vegetation in critical areas, to help ensure retention of adequate stubble height at the end of the growing season in order to protect soil from high spring runoff and snowmelt, and that appropriate grazing levels are being met in Mexican spotted owl habitat. The minimum height is 6 inches of stubble height of sedge species/perennial greenline herbaceous vegetation in satisfactory riparian condition (in PFC), and 8 inches of stubble height of sedge species/perennial greenline herbaceous vegetation in unsatisfactory riparian condition (FAR or NF), at the end of the growing season.

Forage Utilization (Height-Weight, Landscape Appearance, Grazed Class etc.) - To assure that conservative maximum use levels of 30%-40% in key upland areas and levels of 20 to 40% used within northern goshawk habitat are being met. Along with actual use and stubble heights, these methods measure short-term effects of grazing activities and are used as a basis for adjusting future grazing use.

Effectiveness Monitoring -- Objective: Effectiveness monitoring is intended to determine whether management is successful at moving rangeland resources towards desired conditions. The long term-term health of upland and riparian resources will be monitored in key areas or critical areas on each allotments using one or more of the following methods as needed, but not limited to:

Ecological Status and/or Range Condition/Trend - Range transect sites and areas suitable for determining long-term trend in vegetation should be read at years 5 and 10. Emphasize monitoring ecological status.

1. Ecological Status (Cover Frequency/Similarity)
2. Paced Transect
3. Parker 3-Step

Soil Cover – The percent of an area that is covered by vegetation, rocks and litter. Ground cover is important to intercept raindrops impact before reaching the soil. An increase in vegetation and litter cover from baseline measures documented in the project files is considered as moving toward Desired Conditions (DC); a decrease is considered as not accomplishing DC. Soil cover data can be accomplished using any of the protocols below, or through stand-alone data collection.

1. Point Cover
2. Cover Frequency

3. Paced Transect
4. Parker 3-Step

Forage Production – Forage production surveys are optional unless indicated by actual forage utilization levels significantly higher or lower from those listed in the decision for the various land categories, for more than a single year. Forage production surveys will facilitate capacity determination if the rangeland is found able to support more AUMs than the current high end or less than the current low end.

1. Ocular Estimates with Calibration Clipping
2. Production/Utilization surveys and mapping

Noxious Weeds - The location of any noxious weeds should be noted in the monitoring write ups, and transferred into the current Forest Service database. If appropriate, at discovery noxious weeds shall be grubbed out or treated and documented regarding the location.

Monitoring will be used to analyze and if necessary adjust or amend previously described actions in the decision document or AMP. Permittees should be informed of upcoming monitoring dates and invited to attend or assist. Information on monitoring should be shared with the permittee and others concerned with the decision. Data provided by the permittee or other stakeholders can be accepted and used if performed in locations and with protocols meeting Forest Service standards.

If the monitoring data indicates management is not achieving or moving toward the Desired Conditions, Forest Service personnel must analyze the problem and decide on a course of action. If necessary, an ID Team may be instituted to determine if the goals and objectives are correct or need to be adjusted. Re-initiation of NEPA is not necessary if the adaptive action is still within the scope of the original decision.

Monitoring Strategy: Riparian, Watershed/Hydrology, & Soils

Watershed Hydrology Monitoring Methods

Under “watershed monitoring,” most often parameters of runoff timing, runoff quantity, runoff quality, and sediment yield apply. Current levels of livestock grazing usually do not produce measurable change resulting from allotment management on any of these parameters. Runoff timing and quantity is usually a function of either massive precipitation events such as large rainfalls or rain on snow events, or large-scale ground disturbing activities such as wholesale clear-cut logging or fires that remove existing overstory and ground cover. The smaller scale of sediment discharge associated with grazing allotments is best monitored at a local scale, watching for pedestalled plants, surface rill erosion or gully formation within problem areas. Larger basin-scale monitoring of sediment movement is usually studied in relation to river or stream functionality (PFC discussed below) or on even larger scales which aim at geomorphological changes.

As watershed hydrology is intimately related to the health or functionality of its drainage network, monitoring drainage characteristics often pays off. The discussion below pertaining to “Riparian Areas” concerns the proper functioning condition (PFC) of drainage channels.

There are numerous elements that influence watershed function: soil infiltration rates, ground cover, canopy cover, amount of overstory, soil type, soil condition including compaction, soil structure, slope, etc. Many of these factors have been combined into what are known as “runoff curves” in standard methods of calculating potential runoff from different ground cover scenarios

such as urban areas, pavement, and agricultural fields, to name a few. These methods can estimate runoff from whole sub-watersheds or basins and are sensitive to gross differences in cover type, like for example an urban area versus an agricultural field. However, they are not designed to be sensitive to minute changes that occur from subtle differences in compaction for example, or slight changes in litter ground cover. Most runoff formulas use soil type as a constant (soil classes A thru D) and subtle differences in soils are not accounted for. Therefore the concept of runoff curve numbers is incapable of tracking allotment management changes and is wholly inadequate as a monitoring tool at smaller scale.

In terms of monitoring “watershed condition,” attention focuses on ground cover. This item is covered under “Soils” below. Related characteristics, such as monitoring local rill and gully formation or areas of excessive plant pedestalling are also discussed under “Soils.” The condition of drainage channels is discussed under “Riparian Areas” below.

Soil Monitoring Methods

As soil formation is extremely slow, the conservation of soils – the basic resource – is of prime importance. Several attempts at modeling soil erosion have been made, however in order to simplify the countless contributing factors, most of these models were initially designed to simulate erosion from agricultural fields. Later, these models were extrapolated to wildland situations; however their results must be taken at best as gross estimates of actual values. Resulting values serve more as a basis of comparison rather than absolutes.

The most used of these erosion models is known as USLE, or the Universal Soil Loss Equation. The USLE is the most comprehensive technique available for field use in estimating cropland erosion. It involves six major factors that affect upland soil erosion in terms of water: rainfall erosiveness, soil erodibility, slope length, slope steepness, cropping management techniques, and supporting conservation practices. Four values are commonly derived from USLE, including erosion rates and corresponding ground cover for: potential soil loss, natural soil loss, current soil loss and tolerance soil loss. These are further defined in the Apache-Sitgreaves Terrestrial Ecosystem Survey. Briefly, they are defined as follows. Natural soil loss is the rate of soil loss expected under climax conditions, potential soil loss is the loss rate expected under complete removal of ground cover, tolerance soil loss is the loss rate that can occur while sustaining inherent productivity, and current soil loss is the loss rate under existing conditions of effective ground cover.

The most important element in controlling erosion, according to the USLE model, is **ground cover**. A minimum of ½ inch of litter, a live plant base or a rock of at least ½ inch diameter counts as effective ground cover. Data regarding effective ground cover is collected in numerous ways. It is collected from permanent range transects (Parker 3-Step), from Daubenmire transects, from pace transects, or even from ocular estimates. This ground cover data is sufficient to track changes in ground cover, which relates to watershed condition as well as soils.

If more detailed information is desired regarding soils, then the standard Region 3 protocol for **soil condition** is used which more closely looks at numerous site factors that enter into soil function. This may be of use in areas as small as a pasture, in order to assess what elements of soil condition may be at risk the most and it may also yield some answers regarding what needs to change for a better soil condition score.

In specific local instances, **problem areas** with obvious signs of erosion such as rills, gullies, headcuts, or pedestalled plants may be found. If documentation of this is desired, it is recommended to take photographs, roughly describe conditions and mark locations on maps so

they can easily be relocated. It is advised to seek help from SO watershed specialists regarding restoration plans. If needed, conduct a soil condition assessment in order to help determine causes of accelerated erosion that can then be used to change livestock management or to seek other means of helping to correct the situation. In cases of large headcuts or gullies, different livestock management may help the healing process, but active restoration will be needed to reshape affected areas and to provide effective means of stabilization.

Riparian Area Monitoring Methods

The standard assessment protocol for riparian and wetland areas is the **PFC procedure (Proper Functioning Condition)**. This assessment is established for lentic (wetlands) and lotic (streams) areas, and a separate procedure is used for each respective type of riparian area. The lotic procedure uses 17 key yes/no questions, while the lentic procedure uses 20 questions. During the assessment, it is encouraged to answer each question as detailed as possible. In cases of “no” answers, these items then become the focus for future monitoring to determine whether positive change has occurred. In this regard, monitoring of riparian areas becomes very simple, using established procedures, and able to focus on changing only specific elements to obtain satisfactory conditions.

Each of the individual **PFC elements can be quantified** by separate procedures on an as-needed basis. For example, if information is desired regarding species composition, one or more transects can be established in the lentic area in question, to document current and future conditions and trends. Similarly, methods to quantify any site characteristic can be found to help answer specific questions. Under normal circumstances, quantification of PFC elements is not necessary, and field conditions can be photographed and adequately described to serve the purpose of documenting current or improving conditions. See the draft Multiple Indicator Monitoring Field Guide for monitoring examples (Burton et al, 2009).

Lentic and Lotic Area Stubble Height of sedges or greenline perennial vegetation can be measured at seed maturity or later, to estimate whether the minimum stubble height will be retained at the end of the grazing season. A minimum of 6 inches will be present going into winter in satisfactorily functioning areas, and whether a minimum of 8 inches will be present in non-functional and functioning-at-risk areas. The purpose is to keep streambank vegetation and roots healthy and abundant to protect streambanks from erosion during spring runoff, and to encourage maximum growth of sedges needed for riparian / wetland function.

Riparian Condition – This monitoring tracks the effectiveness in improving or maintaining riparian condition.

1. Full PFC assessments of lentic and lotic areas
2. Followup quantifiable assessments of key elements needing improvement

Monitoring Strategy: Wildlife & Fisheries

Monitoring described above for range, watershed, riparian and soils will meet the needs of wildlife and fisheries.

Monitoring of important wildlife habitat parameters (i.e. Mexican spotted owl and northern goshawk prey base) have been incorporated into the range monitoring planned for these allotments.

Fisheries desired conditions focus on maintenance of healthy watersheds, including riparian areas, in order to minimize downstream adverse effects to aquatic species from allotment-generated sedimentation. Monitoring identified for soils, watershed and riparian are also crucial for aquatic resources.

Documentation of Monitoring

All forms of monitoring will be documented and retained in appropriate District files.

Appendix B – Best Management Practices

A Best Management Practice (BMP) is a practice or combination of practices that are determined (by a state or designated area-wide planning agency) through problem assessment, examination of alternative practices, and appropriate public participation to be the most effective, practicable (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.

BMPs from various sources have been incorporated into the authorization, monitoring, adaptive management options and mitigation measures for the proposal. These sources include Arizona Department of Environmental Quality, Apache-Sitgreaves Land Management Plan, Forest Service Handbook 2509.22 (R3 Soil and Watershed Conservation Practices Handbook), and other sources listed in the Specialist Report for Watershed, Hydrology, Riparian and Soils.

The following are examples of BMPs incorporated into project design:

- 1. The location, timing and intensity of livestock grazing** activities shall be implemented with objectives of achieving soil cover to prevent accelerated erosion and to protect water quality.
- 2. Planned grazing systems** shall be implemented to maintain or improve plant cover while properly using the forage available, increasing efficiency by uniformly using all suitable parts of each grazing unit, reducing erosion and improve water quality, insuring a supply of forage throughout the grazing season, increasing production with improved quality of forage, enhancing wildlife habitat, promoting flexibility in the grazing program and buffer the adverse effects of drought. Proper stocking and improved distribution of cattle will be major considerations for evaluating effects of implementing a system.
- 3. Grazing** shall be at an **intensity** that will maintain enough cover to protect the soil or improve the quantity and quality of desirable vegetation. Utilization guidelines may be adjusted by soil condition and other resource concerns. Key grazing areas will be monitored to determine when cattle should be moved to prevent over use. Riparian areas shall be identified as critical areas.
4. Utilize **salt** to improve livestock distribution. Salt a reasonable distance (at least ¼ mile) away from water or natural congregating areas such as roads, trails, and saddles in hills, and avoid key areas. Move salt when distribution objectives are not being met or to correct localized overuse problems.
- 5. Structural range improvements**, when determined necessary to meet desired conditions, such as fences, water developments, trails and corrals, will be planned, constructed and utilized in a manner to enhance or maintain water quality.

Chapter 6 – References

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