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Walnut Grove Grazing Allotment Management

Bradshaw Ranger District, Prescott National Forest
Yavapai County, Arizona



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Reinitiation of 30-Day Comment Period

A Preliminary Environmental Assessment (EA) for the Walnut Grove Grazing Allotment Management was mailed to interested groups and the grazing permittee on March 28, 2011, and a legal notice was published in the Prescott Courier newspaper on March 26, 2011 soliciting comments during the 30-day EA comment period. Since that time, more information has been gathered concerning current resource conditions and anticipated environmental consequences of the two alternatives. This EA has been prepared to disclose this additional information and to solicit public comments for another 30-day period. The new information is displayed in Chapters 3 and 4 of this document. Additionally, the beginning of Chapter 2 contains more detail than previously provided concerning the resource management objectives that have been chosen to measure progress towards desired conditions in areas where the desired conditions are not currently being met. Those that submitted comments during the initial 30-day EA comment period that began on March 26, 2011 have standing for appeal purposes.

CHAPTER 1 – PURPOSE OF & NEED FOR ACTION

Introduction

The Prescott National Forest Interdisciplinary Range Analysis Team has conducted an environmental analysis and prepared this Environmental Assessment (EA) documentation in order to describe alternatives considered for management of the Walnut Grove Grazing Allotment on the Bradshaw Ranger District and the potential effects associated with each alternative. The document is provided for public review and comment and for review and consideration by the decision maker when making the decision. The analysis has been conducted in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations.

The EA is based upon background information about the allotment including current and past surveys and monitoring data, the desired condition of resources on the allotment derived from direction and guidelines in the Prescott NF Land and Resource Management Plan (1987), as amended (Forest Plan), as well as from resource specialists' knowledge of the allotment. This information, provided in Chapter 1, forms the basis for the Forest Service's Proposed Action and the current analysis. Chapter 2 provides detailed descriptions of the Forest Service's Proposed Action Alternative for management of the allotment and the No Action (No Permit Issued/No Grazing) Alternative. At the end of Chapter 2 is a summary table of anticipated effects to each resource area by alternative. Supporting documents, including resource specialists' reports containing details of the existing condition and resource effects, are included in the project record maintained in the Chino Valley Ranger District Office of the Prescott National Forest, Chino Valley, Arizona.

Background

The Walnut Grove Allotment is located on the Bradshaw Ranger District of the Prescott National Forest (PNF) and represents the project area for this environmental analysis, an area of approximately 8,400 acres. The allotment is located in the southwestern portion of the District, approximately fourteen miles southeast of Kirkland Junction, Arizona. (See vicinity map in Chapter 2). The allotment extends from about 2 miles east of the Hassayampa River east to the top of Longfellow Ridge. Generally the allotment is 2 to 3 miles wide and 6 miles long and

contains two pastures. The allotment straddles the lower four miles of Crooks Canyon plus two miles of Milk Creek into which the Crooks Canyon stream flows. Milk Creek is a major tributary to the Hassayampa River.

The elevation of the allotment averages from 4,000 feet at the point where Milk Creek leaves the allotment to 5,500 feet in the northeast corner. The southern 1/3 of the allotment is relatively flat and the upper 2/3 of the allotment is rather mountainous. All major drainages flow into the Hassayampa River via Crooks Canyon, Milk Creek, and Blind Indian Creek.

Precipitation patterns in this area are bimodal with monsoon events occurring during the summer and a second period of precipitation occurring in the winter season. Average annual precipitation across the area ranges from 16 to 25 inches.

There are three distinct vegetation types on the Walnut Grove Allotment. Pinion-juniper woodland covers approximately 6,390 acres or 78% of the allotment and occurs in isolated stands scattered throughout the area. The dominant species within the woodland are one-seed, Utah, and some alligator juniper combined with pinion pine and a native perennial grass understory. The semi-desert grassland covers approximately 862 acres or 10% of the allotment and occurs in stands dispersed throughout the allotment. The dominant species are blue, black, hairy, and sideoats grama; tobosa, Arizona cottontop, and various annual forbs and grasses. Chaparral makes up approximately 605 acres or 8% of the allotment and occurs in isolated stands primarily in the southern portion of the allotment and in fairly dense stands in the north and east portion of the allotment. The principle species within the chaparral areas are turbinella oak, manzanita, ceanothus, silk tassel, and some Apache plume.

The Walnut Grove Allotment is currently permitted for 100 head of cattle, authorized as cows with calves, from October 15th to April 15th, annually. Livestock grazing generally starts in the West Pasture for approximately one month then moves to the East Pasture for four months and then back to the West Pasture until livestock removal in the spring (depending on water availability).

The Prescott Forest Plan has determined that Management Areas 3 and 5, which contain this allotment, are suitable for livestock grazing. Range management in Management Areas 3 and 5 is to be at Level E, which seeks to realize maximum livestock production and utilization of forage allocated for livestock use consistent with maintaining the environment and providing for multiple use of the range. Range management at Level E allows for substantial increases in new structural and nonstructural range developments to help achieve management objectives (Forest Plan, pg. 125). This specific project proposes to reconstruct or improve several water developments that are existing, plus construction of new fencing to protect some riparian areas at Ross and Carter Spring, and the Ross Flat Watershed.

Authority to manage rangeland resources is derived from laws enacted by Congress that authorize the Secretary of Agriculture to administer National Forest System (NFS) lands and issue necessary regulations¹. Where consistent with the goals, objectives, standards and guidelines of Forest Plans, Federal regulations direct the Forest Service to manage forage-producing lands for livestock grazing (36 CFR 222.2 [c]).

¹ Summaries of these laws and regulations are found in the Forest Service Manual (FSM) 2201. Forest Service objectives and policies for rangeland management are found in FSM 2202 and FSM 2203.

Purpose of and Need for Action

The purpose of and need for the actions being proposed by the Bradshaw District Ranger are to continue to authorize livestock grazing on the Walnut Grove Allotment in a manner consistent with Federal laws and regulations and the Forest Plan and to apply adaptive management principles to management of the allotment to provide for movement toward or maintenance of desired resource conditions. Continuation of the livestock grazing authorization, under the described proposed action, is needed for the Walnut Grove Allotment because:

- Where consistent with other multiple use goals and objectives, there is Congressional direction to provide for livestock grazing on suitable lands under the Multiple Use Sustained Yield Act of 1960, the Wilderness Act of 1964, the Forest and Rangeland Renewable Resources Planning Act of 1974, and the Federal Land Policy and Management Act of 1976, as amended.
- It is Forest Service policy to continue to make contributions to economic and social well-being by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood (FSM 2202.1).
- 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 222.2 (c)).
- The lands making up the Walnut Grove Allotment are identified as suitable for domestic livestock grazing in the Forest Plan and continued domestic livestock grazing is consistent with the goals, objectives, standards, and guidelines of the Forest Plan.
- There is a need to provide for management flexibility in order to address changing ecosystem conditions, site-specific concerns, and desired conditions provided by the Forest Plan, as amended.
- There is a need to incorporate formally into the administration and management of this allotment the adaptive management principles established in 2004 as Forest Service Policy in Chapter 90 of Forest Service Handbook (FSH) 2209.13.
- There is a need to utilize existing and new range improvements to facilitate herd management and address resource conditions and concerns.

The Walnut Grove Allotment is scheduled for an environmental analysis of grazing management practices at this time in order to comply with section 504 of the Emergency Supplemental Appropriations and Rescissions Act of 1995, as amended (the Burns Amendment, P.L. 104-19, 109 Stat. 212).

Desired Conditions & Resource Objectives

The desired conditions and resource objectives for resources and infrastructure on this grazing allotment, based on the Forest Plan and the work of the Interdisciplinary Analysis Team, include:

- rangeland management that can respond to local or national demands for livestock production while maintaining air, soil, and water resources at or above minimum local, State, or Federal standards (Forest Plan, pg. 11);
- range administration that provides for the maintenance of satisfactory rangeland management status with a static or upward apparent trend (Forest Plan, pg. 32);

- management of the grazing operations using a system that is responsive to changing climatic or environmental conditions;
- the maintenance of vegetation with mid- to high similarity to the potential natural plant community (PNC) providing for ecological functionality and resiliency following disturbance while sustaining long-term productivity of the land;
- the installation and maintenance of structural improvements, such as water-supply systems, that enhance management control and flexibility and allow for effective distribution of forage use;
- the maintenance of soils in satisfactory condition over the long-term with improvement shown in areas departing from satisfactory condition where livestock grazing is contributing to the condition;
- the maintenance of satisfactory conditions for water resources that meet total maximum daily load (TMDL) and other State water quality objectives;
- the maintenance of functioning spring-fed riparian systems, and saturated soils where potential exists, that support vegetation within site potential and provide habitat for riparian-dependent plants and animals while providing water sources for wildlife and livestock needs;
- the maintenance of fully functional riparian systems supported by herbaceous and multi-age woody vegetation, within site potential, that provides for geomorphically stable stream channels, banks, and habitat for riparian-dependent plants and animals (functional riparian systems support water quality and both hydrogeomorphic and biological attributes and processes);
- protection and preservation of important historic and cultural sites; and
- the maintenance of suitable habitats for Management Indicator Species, Migratory Bird Treaty Act species, Federally listed Threatened and Endangered species, Regional Forester Sensitive species, and for indigenous plant and animal species.

Forest Plan Direction

The Prescott Forest Plan provides the following guidance, management direction, and standards and guidelines for management activities:

All Resources:

- The forest is managed with a primary emphasis on healthy, robust environments with productive soils, clean air and water, and diverse populations of flora and fauna. (pg. 11)
- Cross-country travel by any vehicle is prohibited, with the exception of approved resource management activities (employees/permittees) (pg. 19).
- Implement appropriate [access restriction] measures to ensure that significant long-term resource damage does not occur (page 20).
- Management projects within riparian areas will be in accordance with legal requirements regarding flood plains, wetlands, wild and scenic rivers, cultural and other resources and will be in accordance with standards and guidelines identified in the Southwestern Regional Guide. (pg. 30)

Range Management:

- Provide forage to grazing and browsing animals to the extent benefits are relatively commensurate with costs without impairing land productivity, in accordance with management area objectives. (pg. 12)
- 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 1/4 mile from water and less than 20 acres. Within key forage monitoring areas, select appropriate key species to monitor average allowable use. (pg. 155, Prescott Forest Plan, as amended, and *Record of Decision for Amendment of Forest Plans*, USFS Southwestern Region, 6/96)
- Manage to bring all grazing allotments to satisfactory management by the end of the first decade (1986-1995). Satisfactory management occurs on allotments where management actions are proceeding according to a schedule (allotment management plan), which leads to fair or better range condition with an upward trend. (pg. 32)
- Manage livestock grazing to achieve soil and water protection objectives. Make use of cost effective range improvements and management techniques. (pg. 32)
- Control livestock grazing through management and/or fencing to allow for and favor adequate establishment of riparian vegetation and elimination of overuse. (pg. 32)
- Implement grazing systems and/or methods that will advance the ecological objectives for riparian dependent resources, and require sufficient recovery rest to meet the physiological needs of the plants and plant associations. (pg. 35)
- Proper allowable use within riparian areas will not exceed 20 percent on woody species. (pg. 35)
- Salting within a quarter mile of riparian areas for the purpose of management of livestock is prohibited. This includes the use of salt to gather livestock. (pg. 35)
- Ensure permittee maintenance of existing structural improvements on an annual basis to ensure full life of projects. (p. 34)
- Manage range resources in Management Area 3 – Chaparral, to realize maximum livestock production and utilization of forage allocated for livestock use consistent with maintaining the environment and providing for multiple use of the range. Substantial increases in new structural and nonstructural developments are made to help achieve these objectives. (pg. 58 & pg. 125)

Soils, Watershed, and Riparian Areas:

- Protect and improve the soil resource. (pg. 13)
- Restore all lands to satisfactory watershed condition. (pg. 14)
- Give riparian-dependent resources preference over other resources. (pg. 14)
- Improve all riparian areas and maintain in satisfactory condition. (pg. 14)
- Maintain riparian communities by providing water for wildlife and livestock away from sensitive areas. (pg. 31)
- Livestock will be utilized to achieve soil and water protection objectives when:

1. The ability of livestock to achieve these objectives has been substantiated by verifiable monitoring and/or independent research;
 2. Use of livestock is the most cost-effective means of achieving these objectives; and
 3. Use of livestock will not lead to unacceptable levels of conflict with other resources or management area direction. (pg. 34)
- Minimize impacts to soil and water resources in all ground-disturbing activities. Where disturbance cannot be avoided, provide stabilization and revegetation as part of the project. (pg. 39)
 - Through the use of best management practices (BMPs), the adverse effect of planned activities will be mitigated and site productivity maintained. (pg. 40)
 - Meet the following riparian standards in the Southwestern Regional Guide for 80 percent of riparian areas by the year 2030: (pg. 30)
 - Maintain at least 80 percent of the potential overstory crown closure of obligate riparian species.
 - Manage resources to create or maintain at least three age classes of woody riparian species with at least 10 percent of the woody plant cover in sprouts, seedlings, and saplings, where site potential exists.
 - Maintain adequate emergent vegetation to ensure compliance with the goals of the strategic plan.
 - Maintain at least 80 percent of streambank linear distance in stable condition.
 - Retain snags in riparian areas that are not a safety hazard.
 - Projects impacting riparian areas will be designed to protect the productivity and diversity of riparian-dependent resources. Emphasize protection of soil, water, vegetation, wildlife, and fish resources. (pg. 30)
 - Riparian-dependent resources will have preference over other resources. Other resource uses and activities may occur to the extent that they support the objective of riparian enhancement. (pg. 30)
 - Construct adequate exclosures to protect key riparian areas from livestock grazing where rest rotation or time control grazing fails to provide adequate protection to the riparian areas. (pg. 31)

Wildlife, Rare Plant, Fish & Aquatic Species Management:

- All water developments will consider small game and nongame needs and escape devices. (pg. 27)
- All fencing will be to wildlife standards and consider local species" needs. (pg. 27)

Heritage Resources:

- The forest will comply with the National Historic Preservation Act, Executive Order 11593, the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, and the Programmatic Agreement regarding cultural resources protection and responsibilities executed by the New Mexico, Arizona, Texas and Oklahoma State Historic Preservation Officers (SHPO), the advisory Council on Historic Preservation, and the USDA Forest Service, Southwestern Region. (pg. 21)

Public Involvement

Notice of the intention to initiate the present analysis of the proposed action for this allotment was provided in the Schedule of Proposed Actions (SOPA) as of April 2010 at <http://www.fs.fed.us/sopa/>. A letter dated 7/09/2010 describing the proposed action for management of this allotment was sent to the permit holder of the allotment under consideration, to adjacent allotment permit holders, and to members of the public, non-profit groups, and other entities who have expressed interest in livestock grazing activities. It was also sent to State and Federal government entities and to six Native American Tribes interested in activities in the area inviting them to provide information regarding concerns or opportunities related to the proposal.

Scoping Response / Issue Identification

The purpose of scoping is to provide an opportunity for the public to share concerns or issues they may have regarding an action being proposed by the Forest Service. Issues are defined as concerns about the effects of a proposed action that are not addressed by the project design or alternatives to the proposed action. The subject of an issue must be within the scope of the proposed action and relevant to the decision to be made; not already decided by law, regulation, or higher-level decisions; and must be supported by scientific or factual evidence. Concerns or issues that meet these criteria may be determined to be key issues and may drive the development of alternative actions for analysis if they have not been resolved or already addressed in an alternative.

Three letters were received in response to the scoping period for this project that began on July 9, 2010. There were comments that expressed concern about the riparian areas being adequately protected through project design. The upland soil and vegetation condition in the West Pasture was mentioned as a concern that should be remedied by resting this pasture until desired conditions are met. Other comments focused on the ability of the Forest Service to be able to monitor the allotment and apply adaptive management when needed. There were comments made that the reader needed more information that adequately described the proposed action, and the rationale behind its development. One letter focused mainly on concerns that the planning guidance in Forest Service Handbook FSH 2209.13, Chapter 90, used by the Forest Service to develop the proposed action should have itself gone through an environmental analysis process. The content of each scoping letter was broken down into individual statements of concern that were then responded to by agency personnel (Project Record #31). The Deciding Official reviewed the content analysis from scoping and the agency responses and determined whether the comments would lead to the development of other project alternatives.

No responses received during the scoping period raised concerns that will not be addressed through implementation of the proposed action within the framework of the direction, standards and guidelines of the Prescott Forest Plan. In regards to the scoping comment that the West Pasture should be rested until desired resource conditions are met before resuming livestock grazing, the Interdisciplinary Team and the Responsible Official considered an alternative to address this, but determined that the alternative should not be carried through the analysis for reasons stated in Chapter 2.

Permit and Consultation Requirements_____

Consultation with the Arizona State Historic Preservation Office, in compliance with the National Historic Preservation Act of 1966, will be completed before a decision is made regarding this allotment. Consultation with the Hopi, Hualapai, Tonto Apache, and Yavapai Prescott Tribes, and the Fort McDowell Yavapai and Yavapai-Apache Nations was conducted through project scoping and continued coordination.

Consultation with the US Fish and Wildlife Service (FWS) is not being conducted because there will be no effects to Federally listed species (Endangered, Threatened, Proposed, or Candidate) or their designated Critical Habitats by implementing this project. The Wildlife, Fish, and Rare Plant specialist report in the project record offers further documentation of this determination.

The selected alternative for management of this allotment will be implemented through Allotment Management Plans (AMPs) and Annual Operating Instructions (AOIs), issued by the District Ranger, under a Term Grazing Permit issued for up to 10 years. Additional permits may be issued as long as desirable resource conditions continue to be maintained or are moving toward desired conditions.

Decision to be Made – Decision Framework_____

The Bradshaw District Ranger is the responsible official who will decide, based upon the Purpose and Need for this action, the information provided in this EA, the project record, and other considerations, whether to continue livestock grazing on the Walnut Grove Allotment; if so, under what conditions; and whether new improvements including fences and water system improvements will be constructed. The decision will also include a determination of consistency with the Forest Plan, National Forest Management Act, National Environmental Policy Act, and other applicable laws, regulations and executive orders.

In addition to this decision, the Ranger will make a finding on the significance of the environmental effects anticipated from the implementation of the selected action and whether an environmental impact statement (EIS) will need to be prepared.

Future Review of the Decision_____

Adaptive management, as described in this document, is based on the cycle of implementation of a course of action, monitoring of conditions and results, and adjustment of management as needed to continue to steer a stated course. Monitoring of adaptive management is designed to answer the question “Is acceptable progress being made towards attainment of resource management objectives and thus desired conditions?” Changes in management actions are considered and implemented as appropriate when monitoring indicates that current actions are not being effective in reaching defined objectives. Through the implementation of a NEPA decision that includes adaptive management principles and which identifies an array of possible management practices, the grazing permit, Allotment Management Plan (AMP) and/or Annual Operating Instructions (AOI) may be administratively modified or re-issued over time, based on monitoring, as long as the modified permit, AMP, and/or AOI are within the bounds of the original adaptive management decision and supporting NEPA analysis and documentation. (FSH 2209.13, Section 92.23b)

A project-level, NEPA-based decision, such as the decision to be made based upon this analysis, remains valid as long as the authorized activity complies with laws, regulations, and the Forest Plan, and is within the scope of the decision. Reviews of existing project-level

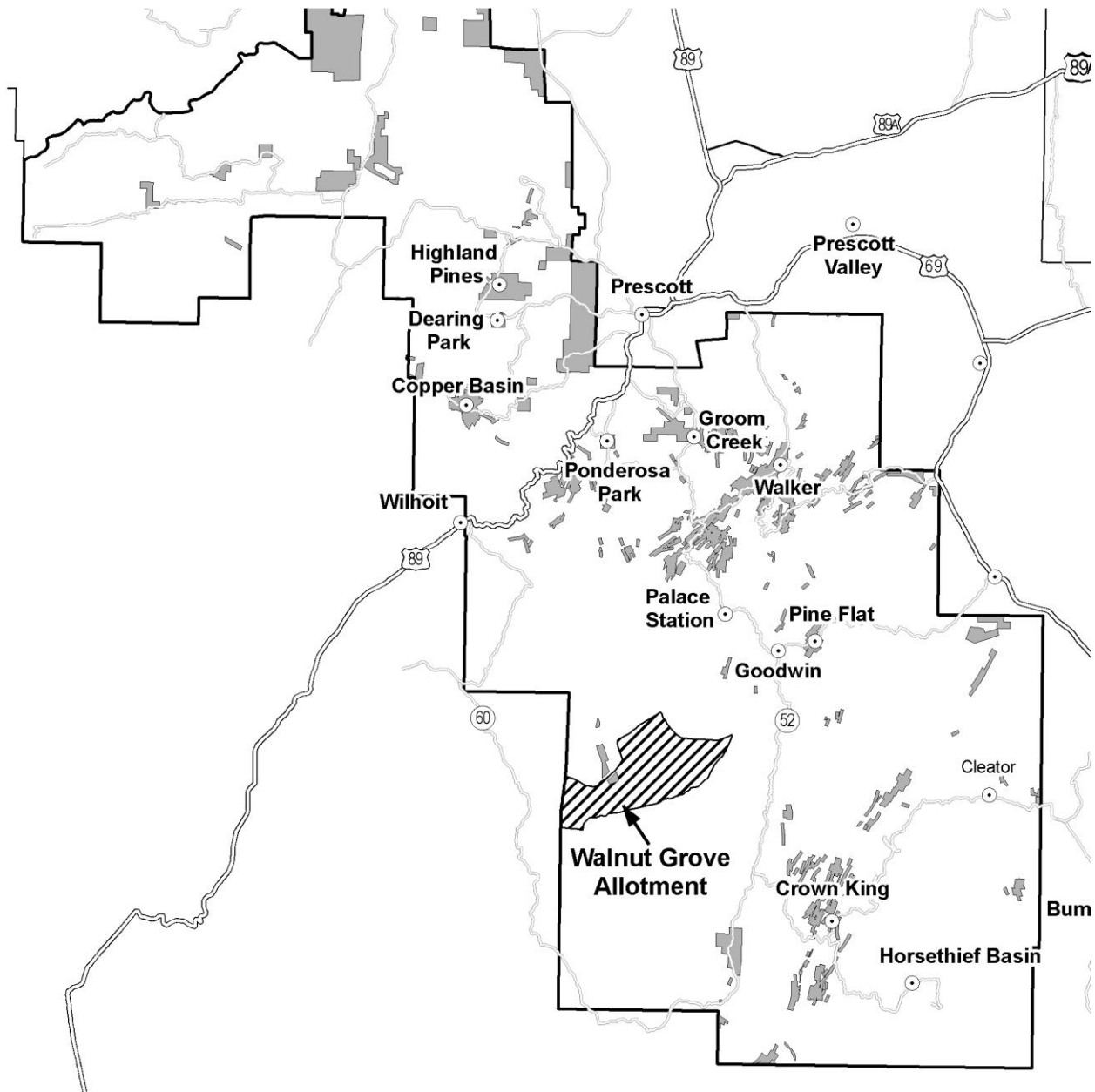
decisions must be conducted on an interval of at least 3-5 years to determine if the grazing activity, permit(s), AMP, and AOIs are consistent and within the bounds of the existing NEPA documentation; if that analysis and documentation continue to remain valid; or if new information exists that requires some further analysis and potential modification of the activity. If the responsible official determines that correction, supplementation, or revision is not necessary, implementation of existing decisions shall continue. The findings of the review shall be documented in the program or project file. (FSH 2209.13, Sec. 96)

CHAPTER 2 – Proposed Action and Alternatives

This chapter describes the alternatives considered for the management of the Walnut Grove Allotment. The alternative descriptions provide the basis for a comparison of alternatives and define the differences between actions which would be taken with each. Monitoring to be conducted is also described.

A map showing the location of the allotment is provided here. A detailed map of the allotment showing pastures and proposed improvements is provided in Appendix 1.

Vicinity Map – Walnut Grove Allotment



Alternatives Considered but Eliminated from Detailed Study

Rest the West Pasture until Desired Conditions are Met

Two comment letters received in response to the scoping letter dated July 9, 2010 voiced concerns that the West Pasture should be rested to allow for resource conditions to improve before grazing is resumed. This alternative was not considered further because there are already provisions in place in the Proposed Action and in the current term grazing permit that allow for non-use of a pasture if resource conditions are such that further grazing would cause damage to resources. For example, during the 2010 winter grazing season the West Pasture was not grazed because of a lack of available forage, and further grazing would reduce residual vegetative biomass and litter below acceptable levels that provide for protection of soils and plant health. There are specific management objectives in place in the Proposed Action that will allow for desired resource conditions to be met while providing for light to conservative use of forage resources in areas of concern. Under an adaptive management scenario, there is the option to rest a pasture or adjust use periods in response to monitoring of current resource conditions.

Departure between Existing and Desired Resource Conditions

A comparison of existing resource conditions with desired conditions as stated in Chapter 1 forms the basis for determining a course of resource management actions. If existing conditions are the same as desired conditions, there is no need for a change from current livestock management. If existing conditions and desired conditions are not the same, there is a need for change. The representative soil map unit in the East Pasture, TES 406, is meeting desired resource conditions for vegetation and soils. In the West Pasture, TES 481 is meeting desired conditions for vegetation, but in some areas soil condition was determined to be unsatisfactory and there is a need to improve protective ground cover to promote soil stabilization. Both TES 406 and 370 in the West Pasture are not meeting desired resource conditions for vegetation and soils. Vegetation in TES 406 is meeting desired condition for similarity to site potential for species mix, but the apparent trend is down. Vegetation in TES 370 is not meeting desired conditions for species mix, the amount of plant cover, and for apparent trend. Soil condition in TES 406 in the West Pasture is unsatisfactory because soil loss is exceeding acceptable levels and more protective ground cover is needed. Soil condition in TES 370 is unsatisfactory because soils are compacted, which leads to increased run off and lack of water infiltration, and there is a lack of protective ground cover from plants and litter.

Crooks Canyon in the East Pasture is meeting riparian resource objectives since it was assessed as being in properly functioning condition. Riparian desired conditions are not being met on segments of Crooks Canyon and Milk Creek in the West Pasture where there is a lack of age class diversity amongst woody riparian plants and the herbaceous component is limited. Desired conditions are not being met in Ross Spring in the West Pasture because there is head cutting and down cutting in the channel resulting in a lowering of the water table, there is a lack of age class diversity for riparian woody plant species, and a lack of herbaceous species. At Carter Spring, there is a lack of herbaceous plant cover to protect the integrity of the channel.

Resource Management Objectives:

Resource management objectives are concise statements of measurable, time-specific outcomes intended to achieve desired conditions. Management objectives are the means of measuring progress toward achieving or maintaining desired conditions. A good management

objective is specific in what it will accomplish; measurable in what it will produce; achievable in that it has a good chance of being carried out; and realistic within the given time frame and scope of the project.

The following management objectives were developed to measure progress towards meeting desired conditions in areas where there is a departure between existing and desired conditions:

Vegetation:

- In TES map units 406 and 370 in the West Pasture, detect an upward trend of herbaceous cover and composition within 5 years

Soil:

- In TES 370 and TES 406 in the West Pasture detect an increase of vegetation ground cover levels and improved vegetation spatial distribution within 5 years.
- In TES 406 in the West Pasture improve vegetation ground cover levels from 16% to 25% within 10 years in order to maintain tolerable soil loss levels.
- In TES 481 in the West Pasture on unsatisfactory soil sites detect an increase of biotic crust and graminoid basal cover within 7 to 10 years.

Riparian:

- Crooks Canyon and Milk Creek in the West Pasture - detect an increase of effective herbaceous presence and woody species recruitment and indicators of increased bank and channel stability within 3 – 5 years.
- Ross Spring - detect an increase of herbaceous cover and gully stabilization within 3 years.
- Carter Spring - detect an increase of herbaceous cover and sediment entrapment within 2 years.

Where desired resource conditions are not being met, site-specific resource protection measures (shown on page 15-16) were developed as part of the proposed action that are intended to lead towards improvement and achievement of management objectives.

Attainability of Resource Management Objectives:

There is a time frame associated with each management objective listed above. The ID Team developed the management objectives and time frames to achieve them considering the best available science as it pertains to the potential for resource improvement that could be realized by changing grazing management only. There is some uncertainty as to whether TES 370 in the West Pasture has the ability to measurably improve in vegetation ground cover and spatial distribution within 5 years, or measurably show an upward trend towards this objective. There is evidence from state and transition models developed for areas similar to TES 370 that once perennial grass cover drops to levels below 5% that it is not possible to revert back to cover levels that are similar to the potential natural community (PNC) levels that are around 28% cover of perennial grasses. The current cover from perennial grasses is only a trace (less than 1%) for TES 370. In order to determine with greater certainty the level of improvement that can be achieved in TES 370 by simply removing grazing, a grazing exclosure will be established. This will be a fenced area of sufficient size to show if perennial grasses can expand naturally in the absence of grazing. The ungrazed exclosure will be compared to the grazed portions of TES 370 to determine if management objectives can be realized in the 5 year time frame. If the

ungrazed enclosure in TES 370 does not show any measurable improvement in 5 years, it will be necessary to re-evaluate the time frame to achieve improved conditions. If the enclosure does improve more quickly than the outside grazed area, that could indicate the need to provide for more rest from grazing in TES 370. It is a site-specific resource protection measure to provide for 1 to 3 years of complete rest in the West Pasture if 5 years of improved grazing management does not result in progress toward desired vegetative condition. A comparison of the TES 370 enclosure and adjacent grazed areas will be made to determine if vegetation trend is upward or not, and what attainable level of improvement can be realized in TES 370 that makes up 8% of the West Pasture.

Alternatives Studied in Detail

Alternative 1 – Proposed Action _____

Proposed Action

The following Proposed Action has been developed to meet the project's purpose and need for action and is designed to comply with Forest Plan standards and guidelines, as amended. The Proposed Action consists of the following elements: Stocking Rate, Adaptive Management, Best Management Practices, Resource Protection Measures, Authorization, Structural Range Improvements, and Monitoring. The Proposed Action follows current guidance from Forest Service Handbook 2209.13, Chapter 90 (Grazing Permit Administration; Rangeland Management Decision-making). The following paragraph describes the rationale for determining the proposed stocking rate that is shown in the Authorization section.

Stocking Rate

The estimated grazing capacity on the Walnut Grove Allotment (Project Record #13) from the historical actual use of livestock grazing records, and application of calculations based upon Holechek (1988), is variable and would support a range of livestock numbers based on fluctuating conditions. Estimates were made on the allotment as a whole and pasture by pasture. Animal Units² (AU) ranged from 20 AU in the East Pasture for 6 months, to 82 AU in the West Pasture for 3 months. The estimated grazing capacity for both pastures for 6 months is 72 AU, or about 430 Animal Unit Months (AUMs)³.

This range of variability is consistent with the legacy analysis data. The allotment is permitted at 100 cattle (cow/calf) for 6 months; however, actual use for the 10 year period from 1998-2007 reveals an average number of cows run to be approximately 84 head for 6 months which is approximately 500 Animal Months (AMs)⁴. It is important to note that Forest Service actual use data in Animal Months (AM) is not synonymous with the animal unit month (AUM) made from calculations based on the consumption of forage; therefore, only rough comparisons are warranted with AUM's estimated through calculations.

² Animal Unit (AU) is considered to be one mature cow of about 1,000 lbs., either dry or with calf up to six months of age, consuming about 26 lbs. of dry forage per day.

³ Animal Unit Month (AUM) is the amount of oven-dry forage required by one animal unit (forage demand) for a standardized period of 30 animal-unit days.

⁴ An Animal Month (AM) is 30-days tenure upon the range by one animal. Must specify kind and class of animal (i.e. cow with calf, yearlings, bulls).

Given this information, a stocking rate within the range of 123 to 606 AUMs (23-100 cattle for 182 days) is identified. As with any capacity estimate, monitoring over time will be necessary to validate this range.

Adaptive Management

The Proposed Action includes the application of adaptive management principles. Adaptive management is designed to provide sufficient flexibility to allow livestock management to address changes in climatic conditions, seasonal fluctuations in forage production, and other dynamic influences on the ecosystem in order to effectively make progress toward or maintain desired conditions of the rangeland and other resources. Adaptive management will also include the implementation of resource protection measures.

Under the adaptive management approach, regular/annual monitoring of short-term indicators may suggest the need for administrative changes in livestock management. The need for adaptation would be based on the magnitude or repeated re-occurrence of deviations from guidelines provided, or due to indications of a lack of progress toward desired resource conditions. The timing of such management changes would reflect the urgency of the need for adaptation. AOI and the AMP may be modified as appropriate to adapt management within the parameters of this proposed action.

If monitoring indicates that progress toward desired conditions is not being achieved on the allotment, management will be modified in cooperation with the permittee. Modifications may include adjustments in timing, intensity, and duration of grazing. Timing is the time of year the livestock are present in a pasture. Intensity is the degree to which forage is removed through grazing and trampling by livestock. Duration is the length of time livestock are present in a given pasture.

These modifications would be made through administrative decisions such as: the specific number of head stocked on the allotment annually or in a particular season; the class of animals stocked (cow/calf pairs vs. yearlings, steers or heifers, etc.); specific dates of grazing; livestock herd movement; and/or periods of rest, deferment or non-use of portions or all of the allotment for an appropriate period of time, as conditions warrant. Such changes will not result in exceeding the AUMs authorized for livestock use included in this proposed action.

Future proposals to use other resource management tools such as prescribed fire or mechanical vegetation treatments will be subject to additional project-specific analysis under the National Environmental Policy Act. Adaptation of livestock management may be applied to accommodate use of these vegetation management tools.

Best Management Practices

Best Management Practices (BMPs) are a practice or combination of practices determined to be the most effective, practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals, and are developed to comply with the Clean Water Act (FSH 2509.22_10.5). The Interdisciplinary Team followed the guidance in the Southwest Region Forest Service Handbook 2509.22, Chapter 20, in the formulation of the following resource protection measures related to range management that also function as BMPs to address water quality and watershed concerns. These resource protection measures will be implemented in order to comply with the Clean Water Act.

Resource Protection Measures

Resource protection measures are incorporated into the project as design features to protect forest resources such as soil, water, vegetation, riparian habitats, and wildlife, as well as to maintain or make progress toward desired conditions.

Allotment-wide Measures: On those portions of the allotment where no specific resource concerns were identified by the Interdisciplinary (ID) Team, livestock will be managed with the objective of maintaining or improving the condition of rangeland resources through the use of grazing intensity guidelines. Holechek and Galt (2000⁵, 2004⁶) provide a comprehensive review of studies related to residual leaf lengths on Southwestern forage species and growth forms as indicators of grazing intensity. They concluded that grazing at moderate or conservative intensities will generally result in maintaining or improving rangeland conditions over time.

Stubble height guidelines for riparian herbaceous species are used as a short-term indicator of livestock grazing impacts and are not a riparian area management objective unto themselves. The goal of management is to achieve desired conditions in riparian areas using the stubble height guidelines as a tool, realizing that the guideline may be adjusted to allow for attainment of riparian management objectives described for this project. The stubble height guideline of 4-6" for hydrophytic species is based on research by Clary and Leininger (2000) and Clary and Kruse (2003) and is intended as a starting point in this adaptive management scenario where management success is based on achievement of desired resource conditions.

Grazing intensity guidelines will be applied across the allotment to provide rangeland managers with information needed to adapt management through adjustments, as may be needed, on an annual basis. Examples of appropriate grazing intensity and forage use guidelines for areas of the allotment that are generally described to be in satisfactory condition include:

1. Conservative grazing intensity (31-40% use) on key herbaceous species during the spring and summer growing periods (typically April 1 to September 30). Note that for this allotment, grazing may only occur between September 1st and April 15th, primarily during the dormant season.
2. Moderate grazing intensity (41-50% use) on key herbaceous species during the dormant season;
3. Moderate grazing intensity (50-60% leaders browsed) on key upland woody species;
4. Minimum stubble height on key riparian herbaceous species, four to six inches where sedges and rushes are key and eight inches where deergrass is key;
5. Up to 20% use on key woody species within riparian areas.

Grazing intensity will be determined using key herbaceous and browse species within key areas. Guidelines would be adjusted if periodic monitoring indicates that desired resource conditions are not being maintained.

Site-specific Measures: The following measures will be applied in areas of concern where current conditions are not meeting desired conditions, and management objectives have been established to measure progress towards meeting desired resource conditions:

⁵ Holechek, J.L. and D. Galt. 2000. Grazing Intensity Guidelines. *Rangelands* 22 (3):11-14.

⁶ Holechek, J. and D. Galt. 2004. More on Stubble Height Guidelines. *Rangelands* 26 (4):3-7.

1. Incidental use⁷ only, regardless of season, on unsatisfactory soil sites in the West Pasture at TES 370, 406, and portions of 481 and unsatisfactory RMS areas with a downward trend that are currently TES 370 and 406 in the West Pasture.
2. Maintain minimum stubble heights on key herbaceous species at riparian and spring areas in partially functional status that includes Milk Creek, Crooks Canyon, and Carter Spring in the West Pasture. The guideline is to maintain eight inches where sedges and rushes are key and 12 inches where deergrass is key;
3. Apply 5 years of livestock distribution techniques and grazing intensity guidelines in the West Pasture. After the 5-year timeframe, if the attainable level of progress toward desired vegetative condition is not shown, one to three years of grazing rest will be implemented for the West Pasture. The attainable level of progress in TES 370 will be shown by comparing the ungrazed exclosure area to adjacent grazed sites. If progress towards desired conditions is not shown in the absence of grazing, this timeframe will need to be adjusted. See page 12 in the section entitled *Attainability of Resource Management Objectives* for more information on the grazing exclosure planned for TES 370.

In addition to the grazing intensity guidelines, the following constructed features serve as site-specific resource protection measures:

4. Construct a fence around Ross Spring to prevent livestock access to the spring source in order to improve riparian herbaceous vegetation and channel stability. Develop the spring and provide livestock water outside the riparian zone.
5. Apply 2 years of livestock distribution techniques to reduce impacts at Carter Spring. After the 2-year timeframe, if progress toward desired condition is not shown, a fence will be constructed to protect the water influenced area of the spring system. This fence will be configured to provide livestock water outside the fenced area.
6. Maintain and modify the existing Ross Flat watershed improvement exclosure to continue to protect compacted and eroding soil sites and provide livestock water.

In the event that the above resource protection measures do not accomplish site-specific resource objectives, additional optional measures may be implemented. These optional measures will be designed to address site-specific resource concerns and may include, but are not limited to, such things as temporary fencing, electric fencing, drift fences, additional livestock exclosures, temporary pipelines and water troughs, reconstruction of existing spring improvements, and construction of new improvements such as spring boxes and water gaps.

Authorization

The Bradshaw District Ranger proposes to continue to authorize livestock grazing on the Walnut Grove Allotment under the following terms:

- ✚ A term grazing permit will be issued providing for seasonal livestock use over a range of 123 to 606 Animal Unit Months (AUMs) for up to 182 days between the periods of September 1 and April 15. (An AUM is defined as the average forage consumed by one cow/calf pair over a period of one month.) As an example, this would provide for livestock numbers to range from 23 to 100 head of cattle, cow/calf pairs and bulls, for six months.

⁷ Incidental Use targets the lower range of the light use (0-30%) category in all seasons by applying such practices as herding or by limiting where livestock attractants such as salt or water are placed relative to the area of concern. Adaptive management methods and practices to achieve this will be based on site-specific allotment management scenarios.

- ✦ Livestock will be managed under a rotational grazing system.

The term grazing permit will be issued for up to ten years. The permit will authorize livestock use within parameters identified in this proposal, and subsequent permits may be issued as long as resources continue to move further toward desired conditions or are being maintained in satisfactory condition, as appropriate.

Structural Range Improvements

Construction of New Range Improvements: In addition to the structural improvements included above in site-specific resource protection measures, the proposed action includes construction of the following structural improvements (see map in Appendix for locations of improvements):

1. Increase water storage capacity at Deer Spring by adding a 3,000 to 5,000 gallon water storage tank.
2. Reconstruct the South Trick Tank water system.
3. Reconstruct the West Trick Tank. If resource objectives have not been met in the West Pasture before reconstruction is complete, additional measures such as a control valve or fence will be added to control livestock access to water in this area.
4. Increase water storage capacity by adding a 3,000 to 5,000 gallon storage tank at Deer Trick Tank and reconstruct the collection apron.
5. Modify the Ross Flat watershed exclosure fence by adding ½ to 1 mile of new fence. (Resource Protection Measure)
6. Construct a new fence around Ross Spring to control livestock access. (Resource Protection Measure)
7. Reconstruct and maintain existing erosion control structures at Ross Flat (Forest Service Responsibility).
8. Reconstruct the Upper Tank in the East Pasture.

Maintenance of Range Improvements: The Term Grazing Permit includes a list of all improvements which the permittee will continue to maintain at a level that effectively provides for their intended uses and purposes. Range improvements will be inspected periodically during the term of the permit to document condition. Annual Operating Instructions (AOIs) will identify range improvements in need of maintenance. Existing improvements may be replaced when their conditions warrant.

Access to Improvements: Authorization for cross-country motorized travel is provided for the permittee to administer the livestock operation and maintain improvements under the terms and conditions of the Term Grazing Permit.

Annual authorization for actions implementing management direction in the Allotment Management Plan (AMP) will be included in the Annual Operating Instructions (AOI) , such as a description of the anticipated level of cross- county travel, travel needed for improvement maintenance, new improvement construction, or reconstruction of existing improvements.

The proposed action scoping letter sent on 7/09/2010 identified the need for maintenance work on a section of road used to access the South Trick Tank. Based on new evidence from field reconnaissance of the travel route into South Trick Tank, it was determined that road repair

would not be needed to allow truck access, and there would be only minimal disturbance required for cross-country access to the range improvement to make the needed repairs. The overland travel route has been surveyed for heritage resources and there will be no impact to these resources. The cross-country travel to make repairs to South Trick Tank would be supervised by Forest Service personnel and would be authorized within the AOI.

All authorizations for cross-country motorized travel are subject to existing regulations intended to protect natural and/or heritage resources. Cross-country travel is not allowed when such travel would cause unacceptable resource damage.

Monitoring

Three types of monitoring will be used - implementation monitoring, periodic monitoring of short-term indicators of resource conditions, and effectiveness monitoring.

Implementation Monitoring: This monitoring will be conducted on an annual basis and will include such things as livestock actual use (# of head, # of months) and scheduled and unscheduled inspections to ensure that all livestock and grazing management measures stipulated in permits, AMPs, and AOIs are being implemented (e.g. cattle numbers, on/off dates, rotation schedules, maintenance of improvements, mitigation measures).

Periodic Monitoring of Short-term Indicators of Resource Conditions: Short-term indicators of resource conditions such as forage utilization, residual forage, species composition, plant cover, frequency or density, and/or vegetative ground cover will be monitored on the allotment at key areas and at areas identified with site-specific resource concerns. Methods will include generally accepted monitoring protocols.

The purpose of periodic monitoring of short-term indicators is to determine:

1. If individual plants have had an opportunity to recover, grow and reproduce following grazing impacts.
2. If sufficient residual forage remains at the end of the growing season to provide for other resource values or requirements such as soil productivity, wildlife habitat, and dormant season use.
3. If maintenance or improvement of rangeland conditions are indicated.
4. If management adjustments are warranted for the following season to provide for the physiological needs of primary forage species and other resources identified as concerns.
5. If soils and riparian areas are maintaining or moving toward desired conditions.
6. If areas of concern are improving and moving toward desired conditions.

Meeting guidelines established for short-term indicators is not a management objective; rather, guidelines are one of the indicators or tools managers use to guide management. These point-in-time monitoring measurements provide information about current resource conditions and apparent trend. When and where resource condition indicators on an allotment are obviously better than those called for under management guidelines, actual measurements may or may not be recorded every year for all key areas; however, at a minimum, observed general forage conditions at the end of each growing season will be documented in the allotment file by rangeland managers. Grazing intensity guidelines may be revised upward or downward as conditions warrant and as monitoring indicates the progress toward desired conditions.

Effectiveness Monitoring: Monitoring, according to a Monitoring Plan to be established in the Allotment Management Plan, to evaluate the success of management in achieving the desired objectives will occur within key and critical areas or on permanent transects at an interval of 10 years or less. Initial baseline information will be collected on this allotment. Effectiveness monitoring may also occur if data and observations from monitoring of short-term indicators suggest a need for additional information.

Both qualitative and quantitative monitoring methods will be used in accordance with Interagency Technical References, the Region 3 Rangeland Analysis and Management Training Guide, and the Region 3 Allotment Analysis Handbook.

Alternative 2 – No Action/No Grazing Alternative_____

Alternative 2 is the No Action/No Grazing Alternative required by FSH 2209.13 Chapter 90. Under Alternative 2, livestock grazing on the Walnut Grove Allotment would be discontinued and the Term Grazing permit would be cancelled after a 2-year notification to the permit holder (FSM 2231.62d/FSH 2209.13-16.24).

Authorization

Under this alternative, livestock grazing would not be authorized.

New Range Improvements

Under this alternative, no new range improvements would be constructed on the allotment.

Maintenance of Existing Range Improvements

Under this alternative, maintenance of range improvements normally assigned to the permit holder would no longer occur.

Cancellation of the Grazing Permit

After cancellation of the Term Grazing Permit, existing structural improvements that contribute to resource protection or that are important to other resources and functions, such as water sources for wildlife populations or fire control, would remain but would not be maintained unless this activity were funded under another resource area on the Prescott NF or by a cooperating partner. Removal of improvements losing their functionality would have to be authorized under a future NEPA decision if new ground disturbance were anticipated. Where allotment boundary fences are necessary, the maintenance of these fences could be reassigned to adjacent grazing permit holders in order to maintain the integrity of the boundaries of adjacent allotments.

The cancellation of the term permit under this alternative does not represent an official administrative closing of the allotment; rather it would represent the suspension of grazing on this allotment for an undetermined amount of time, until or unless a different decision is made. This alternative could be selected by the responsible official in situations of compelling resource concerns where higher resource values may be at risk and conflict directly with livestock grazing management.

Comparison of Alternatives and Effects for Walnut Grove Allotment

Walnut Grove Allotment	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
Authorization (AUMs, Season of Use & Term)	From 123 to 606 AUMs for 182 days between the periods of September 1 and April 15. As an example, this would provide for livestock numbers to range from 23 to 100 head of cattle for six months. Permit term is 10 years.	N/A
Grazing Intensity	Conservative to Moderate, except in areas of concern for uplands or riparian areas where site-specific measures apply	N/A
New Improvements	<p>Add storage capacity at Deer Trick Tank and Deer Spring.</p> <p>Repair/reconstruct Deer, South, and West Trick Tanks and Upper Tank.</p> <p>Add ½ to 1 mile of new fence at Ross Flat Watershed.</p> <p>Construct exclosure fence around Ross Spring.</p> <p>Construct a fence to exclude Carter Spring if desired conditions cannot be met using improved management.</p>	None
Maintenance of Improvements	Maintenance assigned to the permittee during term of permit	Maintenance of range improvements discontinued
Monitoring	Monitoring of implementation and effectiveness of Adaptive Management during term of permit	Monitoring of livestock use and effects discontinued

Walnut Grove Allotment	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
Range and Upland Vegetation Effects	Management flexibility with adaptive management to control the timing, intensity, and frequency of grazing to attain desired resource conditions; apply conservative to moderate intensity guidelines in satisfactory areas; TES 370, 406, and 481 in the West Pasture receive light use levels to retain residual vegetation on-site and promote establishment of perennial grass cover; desired conditions attainable over time within site potentials; uncertain whether TES 370 may be in a stable state of reduced perennial grass cover that may not attain potential natural community (PNC) levels without restoration activities (seeding); establish study exclosure in TES 370 to determine recovery potential; improved livestock distribution through improved water availability; riparian resources at Ross Spring and Carter Spring protected by fencing or improved management.	Livestock use discontinued; desired vegetation conditions met over time with adequate precipitation levels except possibly TES 370 where a stable state could exist with perennial grass cover well-below PNC levels; TES 370 may not improve substantially through rest from grazing alone unless some restoration activities occur such as seeding of native grass species; herbivory by livestock eliminated but wildlife use of forage remains at very light levels so somewhat more residual vegetation biomass remains than under alternative 1.
Soil Effects	Effects to soil condition lessened through enhanced management flexibility. Desired resource conditions achieved over time through the application of site-specific resource protection measures and project design features that serve as Best Management Practices.	Plant canopy cover not removed by livestock herbivory provides protection for soil from erosion and aids in nutrient cycling and physical properties; retaining maximum residual plant biomass and litter results in soil conditions improving more quickly than under alternative 1.
Riparian Areas/Watershed Effects	In uplands increased vegetative cover will gradually lead to increased infiltration and percolation rates and reduced soil erosion. Areas with the largest departure from desired conditions, e.g., TES Map Unit 370, exhibit slower recovery than other key map units. Application of stubble height guidelines for herbaceous vegetation in riparian areas will facilitate	More vegetation remains in absence of livestock grazing that will protect soil and lead to improved watershed condition. However, in areas with greatest departure from desired conditions, e.g., TES Map Unit 370, vegetative recovery will still be slow in the absence of grazing due to reduced soil productivity and current lack of native perennial graminoids.

Walnut Grove Allotment	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
	<p>reaches with hydrophytic species along the greenline to entrap sediment and build streambanks, enhancing water storage capacity and vegetative productivity.</p> <p>At Ross Springs natural increase in herbaceous vegetation; however existing channel incision will delay establishment of obligate species.</p> <p>At Carter Springs increased herbaceous vegetation should increase entrapment and storage of sediment and increase its micro-aquifer storage.</p> <p>At Ross Flat erosion control area reconfiguring fence should facilitate slightly faster vegetative recovery and reduced soil erosion.</p>	<p>More rapid herbaceous recovery of hydrophytic species along the greenline in riparian areas, where present.</p>
Wildlife/Plant/ Aquatic Species Effects	<p>Since the allotment does not contain known populations of Threatened or Endangered species, and potential habitat is lacking, there will be no effects to federally listed species (Endangered, Threatened, Proposed, or Candidate) or their designated Critical Habitats. Riparian and upland areas desired conditions will be improved through conservative use guidelines and continuation of dormant-season (winter) grazing. Increased water availability will be beneficial for wildlife. No impacts on MIS habitat, seral stages, or trend of MIS species forest-wide. Effects to Regional Forester sensitive species and migratory bird species may impact individuals but are not significant and do not create a trend toward federal listing. Meets desired condition for plant and animal species and their</p>	<p>Provides more rapid movement toward desired habitat conditions in both uplands and riparian areas; water availability may slightly decrease as water source improvements age without maintenance; any potential impacts to Forest Service sensitive species, Management Indicator Species and migratory birds from the presence of livestock will no longer occur.</p>

Walnut Grove Allotment	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
	habitats.	
Archaeological Effects	No adverse effects on heritage resources	No effects on heritage resources
Recreational Effects	No adverse effects on recreational opportunities	No effects on recreational opportunities
Compliance w/ Forest Plan and Federal Regulations 36 CFR 222.2 [c]	Yes	No, does not comply with direction to manage forage-producing lands for livestock grazing

CHAPTER 3 – Existing Condition & Environmental Effects

A summary of the existing conditions and environmental effects of each alternative on each resource is provided in this chapter. Each resource specialist has considered the direct and indirect effects that would be expected to occur from implementation of each of the alternatives addressed in this EA. They have also considered the past, present and future activities, listed in the table below, that may be affecting resources in the cumulative effects analysis area as defined for each resource. Cumulative effects result from the addition of the direct and indirect effects on each resource to the effects of these past, present and reasonably foreseeable future actions. The summation of these effects is reviewed in order to determine if all the effects, when considered collectively, accumulate to a significant level. The resource specialist's reports, included in the project record, contain a more detailed account of these considerations.

The following table summarizes the past, present and future activities within the Upper Hassayampa River watershed or within the allotment that have been considered in the cumulative effects analysis and that may have affected or may be continuing to have effects on the resources. The Prescott National Forest administers 64% of the lands within this 5th level watershed. The Walnut Grove Allotment project area only encompasses 4% of the acreage of the entire watershed. The map in Appendix 5 defines the Cumulative Effects Analysis Area addressed by the table.

Past, Present and Future Activities Table Walnut Grove Allotment – Upper Hassayampa River Watershed and Allotment Area Only

Type of Activity	Past Activities/Events in the Watershed	Past Activities on Allotment	Present Activities in 5 th Code Watershed	Future Activities in 5 th Code Watershed
Wildfire Suppression	Historic activity throughout watershed. 2002-2007 2,900 acres wildfires	1972 Battle Fire, approximately 700 acres burned within the allotment; smaller spot ignitions since that time	Human-caused ignitions, lightning strikes.	On-going for Wildland/Urban interface areas & human-caused ignitions.
Vegetation Treatment Projects	2001-2007 Timber harvest: 2106 acres 2008-2009 Thinning: 742 acres 2005-2009 Fuelwood: 329 acres	None noted on PNF GIS layers	Thinning: 130 acres Fuelwood: 20 acres	Timber harvest: 1100 acres
Fire and Fuels Reduction Projects	2003-2007 thinning and mechanical treatment 1,909 acres 2006-2009 Rx burns 2419 acres	None noted on PNF GIS layers	Fuel treatment: 1584 acres Prescribed Fire: 900 acres	Fuel Treatment: 14000 acres Prescribed Fire: 7000 acres
Wildlife/Aquatic Habitat Improvement Projects	Ross Flat Watershed fencing – 1970's	Ross Flat Watershed fencing – 1970's	None at present	Ross Spring/Carter Spring enclosure fencing

Type of Activity	Past Activities/Events in the Watershed	Past Activities on Allotment	Present Activities in 5 th Code Watershed	Future Activities in 5 th Code Watershed
Livestock Grazing	Past allotment management of allotments on NFS lands; livestock grazing on other land ownerships.	Grazing has occurred within the project area for over 100 years	Stocking levels reflect forage and range conditions w/associated structural improvements	Grazing is expected to continue with 10-year permit renewals
Water Supply Improvements	Spring boxes and collector pipelines; irrigation diversions, ditches, and returns; domestic and irrigation wells with associated distribution systems	Deer Spring has collection box and pipeline; 3 existing trick tanks and 3 earthen stock tanks	Continuing maintenance of existing improvements	Additional wells on private land in the watershed; develop Ross Spring to provide water outside fenced enclosure
Recreational Activities	Camping in 3 PNF developed campgrounds, dispersed camping, hiking, trailheads, OHV, snow-play and day-use areas, unauthorized OHV use, hunting, sight-seeing	Dispersed camping, hiking, OHV use, hunting, sight-seeing	Continuation of past activities, Travel Management Rule Implementation	Same as present activities
Roads, Utility ROWs, Land Development and Land Exchanges	410 miles of road on Prescott National Forest plus 131 miles on other ownerships. Road maintenance. Utility ROW maintenance, communication special uses, gravel pits, private land fencing and access through NF	Approximately 8 miles of unimproved roads on allotment; numerous small two-track roads of undetermined mileage	Same	Same, plus unknown new roads possible
Mining	67 mines (on all included land ownerships). Both placer and lode mining dating from mid 1860's	None on allotment	76 current and pending in watershed;	Placer claim development 1.5 miles north of project area near Milk Creek; Continuation of current and pending plus unknown new

Rangeland Vegetation ---

Existing Condition:

The Terrestrial Ecosystem Survey (TES) of the Prescott National Forest and the associated Ecological Classification are used to identify what type of vegetation and in what relative amounts should be present within the project area based on soils, climate, slope, and geology. The TES is also used identify the current community type that is present based on effects of past management. The TES identifies these unique assemblages as TES map units. The process and methodology used to evaluate and describe vegetation condition is further explained in "Process for Assessing Rangeland Conditions as Part of Rangeland NEPA Analysis on the Prescott National Forest (Project Record #38) and following direction from the R3 Rangeland Analysis and Management Training Guide (USDA Region 3 1999).

It is not practical to individually analyze each TES map unit occurring within an allotment or project area. Instead, representative map units are selected for each pasture within the allotment based on the key area concept, described as “the key area is a portion of range which, because of its location, grazing or browsing value, and/or use serves as an indicative sample of range conditions, trend or degree of seasonal use” (SRM 1989). The TES units selected for analysis based on the key area concept are TES 406 in the East Pasture (16% of total pasture), and for the West Pasture TES 370 (8% of pasture), 406 (29% of pasture), and 481 (22% of pasture). When setting goals for what the plant community should look like in the project area, it is recognized that the effects of cattle grazing on the vegetation will be focused on plant species that cattle prefer as forage, usually grasses.

Rangeland Management Status (RMS) is a term used to describe the success of past grazing management in meeting resource goals for rangelands (USDA Region 3 1999). The RMS is described as satisfactory when the species mix and cover of the existing plant community exhibits a mid similarity (34-66%) or higher with the desired vegetation status (DVS), and there is a static or upward apparent trend⁸ that leads to maintaining the desired vegetation status over time. The DVS is determined in an ID Team setting based on management goals for the resource. In this case, the DVS is to achieve mid- to high similarity with the Potential Natural Community (PNC) as expressed for individual map units in TES. An existing plant community with low similarity (0-33%) to the DVS is considered to be in satisfactory Rangeland Management Status if the apparent trend is upward and progress towards achieving the desired plant community is shown.

For the Walnut Grove Allotment, the desired condition for vegetation is being met in the East Pasture. In the West Pasture, the vegetation in TES 481 and 406 is moderately to highly similar in species mix and plant cover to the desired plant community, but in TES 406 current drought effects are causing an apparent downward trend. Once adequate precipitation occurs, this trend is expected to reverse and desired vegetation conditions will be met in TES 406. TES 370 in the West Pasture consisting of 295 acres (8% of entire pasture) is the only area where there is a low amount of similarity between the existing and the desired plant community. The table below displays the relative similarity between the existing vegetation and the desired vegetation status of the perennial grass component for key map units.

Allotment Pasture / TES Unit	Approximate Desired Vegetation Status	Apparent Trend	Rangeland Management Status (RMS)
East - 406	High Similarity -At Potential (HS)	Static	Satisfactory
West – 370	Low Similarity (LS)	Down	Unsatisfactory
West - 406	High Similarity (HS)	Down	Unsatisfactory
West- 481	Mid Similarity to near Potential (MS)	Static	Satisfactory

⁸ **Apparent trend** is an interpretation of trend based on observation and professional judgment at a particular point in time. *Forest Service Handbook R3 2209.21 Chapter 40*.

Trend expresses the direction of change, if any, in status in response to past and existing livestock management practices and land use activities combined with other environmental factors. The trend of a rangeland area may be judged by noting changes in vegetation attributes such as species composition, density, cover, production, and frequency. *USDA/USDI, Interagency Technical Reference, 1996*.

The Forest Plan states (page 32) that „satisfactory management“ shall occur on grazing allotments, meaning that management actions are proceeding according to a schedule (in this case an Allotment Management Plan) “which lead to fair or better range conditions with an upward trend”. For the purposes of this analysis, areas determined to be in satisfactory RMS are considered to meet Forest Plan direction for „satisfactory management“.

Direct & Indirect Effects on Range Vegetation:

The Range/Vegetation Specialist’s Report addresses the direct, indirect and cumulative effects of each alternative analyzed by the Interdisciplinary Team. A summary of the effects is provided here, with further details found in the complete report.

Alternative 1 - Proposed Action

Grazing by cattle can directly affect upland plants by reducing plant height, total canopy cover, and ground cover. The degree of these effects is influenced by utilization guidelines and timing of use. Over time, if grazing intensity is too high, indirect effects can occur such as a loss of plant species and a resultant shift in composition to less-preferred forage plants, and total forage production can be reduced. Repeated grazing impacts without allowing plants adequate time for regrowth exposes the soil to potential erosive forces from water and wind. Range research supports the concept that forage plant health and productivity, and overall ecological condition of rangelands can be improved or maintained through properly managed livestock grazing (Holecheck, et al. 1999). The conservative utilization guidelines as prescribed for this project have been shown to increase forage production and improve vegetation composition (Holecheck et al. 2004). Adequate precipitation is essential to achieving optimal plant vigor and production. Grazing will continue to be managed allowing for seasonal use during the dormant season with pasture rotation between the two pastures allowing for deferment in the cool season. Deferred rotation allows key forage species the opportunity to store carbohydrates and set seed during periods of seasonal rest. The proposed improvements to existing water sources will make them reliable and aid in proper livestock distribution. More reliable upland water will also alleviate cattle watering from riparian areas.

In TES 406 in the West Pasture, the apparent trend was downward resulting in unsatisfactory Rangeland Management Status (RMS). The existing cover and composition of perennial grasses is meeting desired conditions, but the downward apparent trend may cause reductions in cover over time if the trend is not reversed. There may be limited opportunity to improve cover from perennial grasses given that the shrub layer at this site accounts for 32% cover and shrubs will compete with grasses for sunlight and soil moisture. Maintaining the existing cover and composition of perennial grasses while realizing an upward apparent trend would meet management objectives for desired vegetation condition in TES 406. Apparent trend is a point in time measurement of plant health that is highly influenced by current year’s precipitation, and as such, may quickly reverse given adequate precipitation and proper livestock management.

In the West Pasture, TES 370 is also currently showing unsatisfactory RMS based on low-similarity of existing vegetation to the desired condition, and an apparent downward trend. This soil map unit showed only a trace of perennial grasses present along the sampled transect, while the PNC for this site would have 28% cover from perennial grasses. The current conditions at TES 370 resembles the “exotic-invaded” state described in the ecological site description state and transition model for Major Land Resource Area (MLRA) 38.1 Clayloam Upland at 12-16” precipitation. The described alternative states for vegetation are stable states that will persist even in the absence of grazing (Westoby et al. 1989, Laycock 1991). Based on the state and transition model, to revert back to PNC levels of grass cover would require weed

control and seeding and possible planting of tobosa grass plants. Even if a threshold has not been crossed and natural recovery is possible, it may take decades to show measurable improvement in perennial grass cover from the degraded state now present in TES 370 (Castellano and Valone, 2007). The grazing guideline of overall light use (0-30%) will aid in leaving residual biomass and plant litter on the soil, thereby improving water infiltration, soil organic matter, and plant production over time. The allotment will continue to benefit from growing season rest from mid-April through August each year, which should help to establish perennial grasses when precipitation is adequate. Improving plant health and observable reproduction (indicators of upward apparent trend) in the few grasses that do exist would be a qualitative indicator of management success in TES 370. The management objective for TES 370 is to detect an upward trend of herbaceous cover and composition within 5 years. It may be difficult to detect an upward trend in plant cover and composition in 5 years, but the creation of a grazing exclosure in TES 370 will aid in determining what level of improvement is attainable based on natural recovery rates alone in the absence of grazing. The 5-year time frame may need to be adjusted if the ungrazed exclosure does not show detectable signs of an upward trend in that time frame.

Under the Proposed Action, desirable forage plant density, plant species composition, and vigor should improve to attainable site potential given normal precipitation patterns. Range condition and trend are expected to remain static or static to upward on this allotment due to the dormant season grazing system which will continue to be implemented on the allotment, and through the application of grazing intensity guidelines and resource protection measures.

Alternative 2 – No Action/No Grazing Alternative

Under the No-Action Alternative, all cattle grazing within the allotment would be phased out over a 2-year period. Livestock impacts on vegetation and soils would be removed. Only incidental wildlife grazing would occur sporadically at light intensities. Key areas would receive only incidental forage and browse use. Desirable forage plant density and biomass would increase, plant species composition would improve, and the vigor of forage plants would improve with adequate moisture. The apparent trend in key areas can fluctuate independently of any grazing influence. The trend with regard to similarity to the desired vegetation status may fluctuate based upon local climatic events; however, the expectation with average or above-average rainfall patterns is that the trend is expected to move toward achieving the desired condition.

The application of no managed grazing will likely realize success in meeting management objectives in TES 406 in the West Pasture, and would maintain the satisfactory RMS found in the East Pasture. In TES 370 (8% of the West pasture) where there is the largest departure between existing and desired conditions, there may be little or no measurable improvement in grass cover for many years in the absence of grazing. If a threshold has been crossed whereby the plant community cannot revert back naturally to the grass-dominated state at PNC, then the desired vegetation condition for TES 370 (mid to high similarity to PNC) can only be attained if management actions such as seeding are undertaken. This alternative does not propose such actions. The management objectives for TES 370 and 406 can be stated as: detect an upward apparent trend of herbaceous cover and composition within 5 years. This is achievable and likely measurable under alternative 2 for TES 406 in the West Pasture. For TES 370 improvement may be difficult to measure in 5 years as it pertains to perennial grass cover and composition improvement. Without grazing, existing grass plants in TES 370 should show improvement in vigor commensurate with precipitation within 5 years, and there may be qualitative indicators of improvement such as more annual vegetation protecting soil, or bare spaces filling in with perennial forbs that serve as colonizing species. All areas would receive

only minimal forage and browse utilization by wildlife, so more residual plant biomass would be retained than under alternative 1.

The cancellation of the grazing permit would create an absence of maintenance of structural improvements. Water developments and fencing would no longer be maintained unless sufficient funds in another program area allowed for such maintenance. Allotment boundary fence maintenance may have to be assigned to adjacent grazing permit holders, creating an economic burden on them. The loss of water system improvements may have adverse impacts on wildlife habitat.

Range Improvement Effects

The Proposed Action calls for reconstructing several water developments, mainly trick tanks. These are all existing water sources, and as such, reconstructing them should not impact existing vegetation other than in a limited, small area around the existing site. Access to the existing improvements by overland travel with machinery will damage some herbaceous plants in a limited area. These plants should recover quickly once precipitation occurs. Employing Best Management Practices (BMPs) that limit travel to when soils are dry should mitigate long-term effects to soils and retain the productive potential for vegetation. Alternative 2 would not implement the reconstruction of any range improvements, and as such would not disturb or damage any vegetation.

Cumulative Effects on Range Vegetation Resources

The cumulative effects analysis area considered for effects on range/vegetation resources consists of the Walnut Grove Allotment project area. The past and present activities and events that have affected the vegetation include livestock and wildlife grazing, recreational activities, past wildfires, and roads. These activities may affect vegetation in ways similar to livestock grazing through removal of plant canopy cover. Indirectly these activities may affect vegetative productivity by causing soil compaction that leads to reduced water infiltration and then to reduced plant growth. Removal of vegetation can expose the soil to erosion and thereby reduce long-term productive potential for vegetation.

Site visits show that impacts from recreational activities on the allotment are limited to small, localized areas consisting of throw-down camping spots on main roads. Long-term impacts from 100 plus years of grazing on the allotment are reflected in baseline conditions for vegetation, discussed previously. There is evidence of a trace amount of browse on desirable shrubs by deer and other wildlife, but this use is minimal over the entire allotment. Allowable use guidelines do not distinguish between wildlife use and livestock use. Where roads exist over approximately 8 linear miles on the allotment there is an absence of vegetation. No new roads are planned, and this effect should remain constant and localized. Occasional road maintenance may damage or remove small amounts of vegetation adjacent to roads. Run-off from improperly drained roads has the potential to accelerate soil erosion and remove existing plants. The 1972 Battle Fire consumed vegetation to varying degrees over approximately 700 acres, but these effects are likely indiscernible from unburned areas after nearly 40 years. The effects of these other activities, when added to livestock grazing and management as described under the proposed action, do not change the anticipated effects over-all with regard to the apparent trend of the desired vegetation status or the rangeland management status. The impacts created through livestock grazing, improvement reconstruction and the adaptive management described for the action alternative, when added to the other past, present and future activities listed in the table at the beginning of Chapter 3, do not together accumulate to

levels that are considered to be significant for the vegetative resources, nor are they expected to lead to irreversible effects to vegetation.

Economic Analysis

The Range Economic Analysis Report (project record #32) was prepared to compare the economic impacts of the proposed action and the no grazing alternative on the local economy and effects to all the partners that are involved in the implementation of the proposed action, including the Forest Service, the grazing permittee, and outside partners. The analysis was conducted using the Quicksilver software program. Although projections from the Quicksilver model are precise in measurement, they are best used as an indicator of change rather than a precise measurement.

The project area is contained within Yavapai County, Arizona. The county receives payment from the Federal government in two ways: (1) Payments in Lieu of Taxes (PILT), and (2) Secure Rural Schools and Community Self Determination Act of 2000 (SRSCSD). Prior to passage of SRSCSD and adoption of this method of payment by Yavapai County, the county would instead receive 25% of the revenues generated from Forest Service System lands, including grazing fees. Funding through this act provides for stable revenue to Yavapai County independent of fluctuations in grazing fee revenues from public land.

The costs of implementing the project that are borne by the Forest Service include the cost of permit administration, monitoring, and providing some materials for structural range improvements. Monetary benefit to the Forest Service is in the form of grazing fees collected. The costs borne by other partners include funding some of the structural range improvements that will be reconstructed as part of the proposed action. The costs incurred by the permittee include the cost of hired labor to manage the herd, structural improvement maintenance and construction, range improvement surveys, and monitoring of range resources to comply with grazing instructions. The benefits gained by the permittee include revenue from the sale of calves, and the added value that the public rangeland provides to the overall ranching operation. Other intangible benefits were not considered in the analysis, such as water sources maintained by the permittee providing for improved wildlife habitat and perhaps greater numbers of game animals. When considering all partners, the benefit to cost ratio of Alternative 1, the proposed action, was 1.65:1, indicating a higher value of benefits than costs, overall. Since no dollar figures were placed on benefits under the no grazing alternative, there was not a benefit/cost ratio assigned for that alternative. Implementing Alternative 2 (No Grazing) would cause adverse economic impact to the grazing permit holder due to a loss of revenue resulting from the livestock that could occupy this allotment. The permit holder may have other ranching operations outside this allotment that would not be affected by a removing grazing on the allotment under alternative 2.

Effects to the Local Economy:

Since funding to Yavapai County does not depend on the collection of a portion of the Federal grazing fees, neither alternative would have an effect on Federal receipts to the county. Under the no grazing alternative, all jobs directly associated with livestock grazing on the Walnut Grove Allotment would be eliminated. Some of the jobs indirectly associated with livestock grazing on the allotment may also be eliminated; however, most indirect jobs will likely be maintained because the need for ranching supplies and services will continue to be filled by other ranches and individuals/ businesses from the surrounding communities.

Soils

Existing Condition:

Watershed condition includes both the upland portion of the watershed and the stream courses with their associated riparian and aquatic vegetation. The upland portion of the allotment contains areas in both satisfactory and unsatisfactory watershed condition. The areas which were identified as unsatisfactory are within the West Pasture. Sampled areas of TES 406 and 370 were identified as currently being unsatisfactory, while TES 481 had components of both satisfactory and unsatisfactory condition. The soil condition rating procedure evaluates soil quality based on an interpretation of factors that affect three primary soil functions that are: soil stability, soil hydrology, and nutrient cycling. The soil hydrologic functions of infiltration and percolation have been impacted on unsatisfactory sites resulting in greater surface runoff from intense rainstorms, along with greater soil detachment and removal through erosion. As a result, areas of sheet erosion, rilling, hummocking, and gully erosion are present on the allotment.

Representative TES map units were selected within each pasture to display the effects of livestock grazing on the soil resource. The Interdisciplinary Team selected the representative areas based on both a mapping exercise using the TES survey for the Prescott National Forest combined with site specific observations to determine where livestock grazing was most likely having an influence on current conditions. The following table describes the soil condition findings of each representative map unit by pasture.

Analyzed Soil Condition Findings					
Pasture	TES	Sampled Soil Condition Findings	PNF TES Soil Condition	Acres	Percent of Pasture
East	406	Satisfactory	Satisfactory	733	16
West	370	Unsatisfactory	Impaired	295	8
West	406	Unsatisfactory	Satisfactory	1086	29
West	481	Satisfactory/Unsatisfactory	Unsatisfactory	804	22

The representative map unit in the East Pasture, TES 406, is stable and in satisfactory condition. Under the key area management concept, if monitoring shows that desired resource conditions are being met in those areas favored by cattle, then secondary foraging areas will show less grazing impacts to the soil resource, and as a consequence soil conditions should remain static or improve in secondary foraging areas. The East Pasture is 4,444 acres in size with 733 acres in TES 406 actually evaluated for soil condition. This represents 16% of the entire pasture acreage that was evaluated.

Soil conditions in the West Pasture range from satisfactory to unsatisfactory condition. The West Pasture consists of 3,718 acres of which 37% was rated in unsatisfactory soil condition in TES units 370 and 406. There are areas of TES 481 that exhibited unsatisfactory soil characteristics but the entire map unit consisting of 804 acres (22% of West Pasture) is a mix of satisfactory and unsatisfactory condition. Both TES 370 and 406 were determined to be in unsatisfactory soil condition based on field data collection. This rating is a departure from the TES soil condition. Observed conditions in TES 370 leading to this determination include severe compaction with minimal soil and surface organic matter present. Increased soil compaction leads to a decrease in water infiltration rates, which is likely to result in increases in runoff and accelerated soil loss through erosion. Existing vegetative groundcover in TES 370 is substantially lower than would be expected at site potential, so more bare soil is exposed that is

vulnerable to erosion. In the West Pasture, TES 406 was also determined to be in unsatisfactory condition based on field sampling results. This map unit exhibited compaction in some areas along with low vegetative ground cover levels and poor vegetation distribution. These observed qualities can promote accelerated runoff and elevated soil loss rates above tolerable levels. Maintaining adequate vegetative ground cover levels and spatial distribution would minimize the risk of accelerated soil loss that may negatively impact soil productivity. Portions of TES 481 are experiencing satisfactory conditions while other areas are exhibiting unsatisfactory condition due to active gullying.

In the West Pasture, TES 370 and portions of TES 481 also exhibit soil instability associated with active gullying. These soils are inherently susceptible to gullying since they are considered to be deep, have non-cohesive parent material, and are influenced by the additional run-on received from adjacent mountain hill landforms. These soils are also susceptible to compaction and displacement from load-bearing stress (e.g. hoof impact, concentrated foot travel, mechanical activity, etc.). Maintaining optimal vegetative ground cover levels (as described in TES), soil organic matter, and soil spatial distribution would assist in alleviating compaction and promote infiltration of the additional run-on to these sites and decrease runoff and accelerated soil loss. Discouraging concentrated and continuous use during wet periods would minimize the soil's susceptibility to damage during wet periods. Integrating regular rest would allow soils to recover from load bearing stress and wet weather damage by allowing soil structure to recover through freeze-thaw and shrink-swell processes.

The Ross Flat erosion control project was implemented in the late 1970s and included erosion control structures to address an active rill and gully system. The primary area was fenced to speed vegetative recovery. At least one of the earthen gully plugs catches and holds water and livestock are using it and grazing on nearby herbaceous vegetation.

Direct & Indirect Effects on Soils:

The effects analysis predicts a soil condition trend and does not necessarily predict a change in soil condition class. There are many factors that influence soil condition processes and changes in soil function are very variable and could take up to 100 years.

Alternative 1 - Proposed Action

Terrestrial Ecosystem Survey (TES) 406 in the East Pasture would remain in satisfactory soil condition because resource protection measures such as grazing intensity guidelines would be employed to help retain adequate plant and litter cover to protect soils. The same would hold true for the satisfactory soil conditions of TES 481 in the West Pasture. The retention of groundcover from litter and live plants would be to a lesser degree than anticipated under the No Grazing alternative, but would still allow for maintenance of desired soil condition.

The unsatisfactory soil conditions of TES 370 in the West Pasture are expected to improve, but not as quickly as anticipated for Alternative 2, No Grazing. Soil condition would improve over time because resource protection measures that function as Best Management Practices will be employed to retain plant and litter protective cover on soils and alleviate the accelerated soil loss over time. Adaptive management measures that adjust the timing, intensity, and frequency of grazing will be used to meet the soil management objective in TES 370, which is to detect an increase of vegetation ground cover levels and improve vegetation spatial distribution within 5 years. The attainable level of improvement in TES 370 will be determined by establishing a grazing enclosure. Prescribed light use (0-30%) and discouraging livestock concentration in TES 370 would promote retention and improvement of graminoid cover, assist in retaining soil and surface organic matter, and minimize load bearing stress associated with concentrated

livestock use. This would alleviate soil compaction and improve soil structure, improve nutrient cycling, decrease run-off, and assist in stabilizing accelerated soil loss. Active gulying would continue until equilibrium of run-off, sediment production, vegetation ground cover retention, and angle of repose are gained.

Unsatisfactory soil conditions of TES 406 in the West Pasture are expected to improve by employing resource protection measures that limit grazing intensity in order to retain adequate plant and litter cover. Improvement would not occur as quickly as it would for Alternative 2. Adjustments in the timing, intensity, and frequency of grazing within the guidelines described for resource protection measures would be employed to achieve soil management objectives for TES 406. These include detecting an increase of vegetation ground cover levels and an improvement in vegetation spatial distribution within 5 years along with moving toward vegetation ground cover levels that would decrease soil loss levels below tolerable within 10 years. Prescribed light use levels (0-30%) and discouraging livestock concentration would promote vegetation ground cover retention and recruitment, improve vegetation ground cover spatial distribution, and minimize load bearing stress associated with concentrated livestock use. This would alleviate soil compaction in areas and improve soil structure, promote nutrient cycling, decrease run-off, and stabilize soil loss to levels below tolerable.

The unsatisfactory portions of TES 481, associated with active gulying and erosion pavement, would experience indicators of some stabilization, where attainable, but not to the extent as Alternative 2. Resource protection measures that limit grazing intensity to light levels (0-30%) and limit livestock concentration in the area would not exacerbate active gulying. Soil management objectives for the unsatisfactory portions of TES 481 are to promote the increase of non-transitory vegetation ground cover elements (i.e. graminoid basal cover, biotic crusts, etc.) as a means to provide more dependable ground cover to stabilize the soils. The increase of vegetation ground cover would assist in improving the hydrologic, stability, and nutrient cycling function. However, active gulying would continue until equilibrium of run-off, sediment production, vegetation ground cover retention, and angle of repose are gained.

Alternative 2 – No Action/No Grazing Alternative

Because no livestock grazing would occur, TES 406 in the East Pasture and portions of TES 481 in the West Pasture would remain in satisfactory soil condition and vegetation ground cover would be retained on site for nutrient cycling, favorable soil structure and infiltration, and soil stability.

The unsatisfactory soil conditions of TES 370 and 406 in the West Pasture would be expected to improve because no livestock grazing would occur, and plant cover and soil and surface organic matter would increase and be retained on site. This, in addition to a lack of load bearing stress associated with livestock grazing would improve soil compaction and soil structure. Nutrient cycling and infiltration rates would improve resulting in soil stability and a decrease in run-off. Active gulying would continue but soil stabilization would most likely be more rapid than Alternative 1 because of no livestock grazing impacts. The additional accumulation of vegetation ground cover would improve the hydrologic function, promote nutrient cycling, and stabilize accelerated soil loss to levels below tolerable.

The unsatisfactory portions of TES 481, associated with active gulying and erosion pavement, would show signs of greater improvement than Alternative 1, but soil conditions would remain in unsatisfactory condition because gulying would continue. Livestock influences would not exacerbate active gulying, hasten the recruitment of graminoid cover and biotic crusts, and vegetation ground cover would be retained on the site. Additional retention of vegetation ground

cover would contribute to the improvement of the hydrologic, stability, and nutrient cycling functions. This would assist in the recovery of stabilization but active gullying would continue until equilibrium of run-off, sediment production, vegetation ground cover retention, and angle of repose are gained.

Range Improvements

The direct effects of the physical impact associated with range improvement installation will be realized over a small, localized area that will be disturbed by construction activities. Maintenance and construction activities have the potential to decrease and damage protective vegetative ground cover, cause soil displacement, and compaction over a small localized area. The short-term disturbance to vegetation and soil has the potential to decrease infiltration, increase runoff, accelerate soil loss, disrupt nutrient cycling, and ultimately negatively impact productivity, but once construction activities cease the resource should recover within a few years. Soil disturbance and excavation can also expose unfavorable subsurface soil properties that may reduce soil productivity. For example, subsurface soils with high levels of clay may negatively impact infiltration, soil aeration, and plant propagation. Also, disturbance to calcareous soils may expose lime to the soil surface resulting in the increase of pH levels which can negatively impact the cation exchange capacity and ultimately soil fertility. These potentially negative impacts would be largely mitigated by implementing range improvement soil and water conservation practices identified in the Best Management Practices (BMPs) section of the Soils Report (Project Record #46).

Range Improvement Effects

Alternative 1, Proposed Action:

The installation and maintenance of range improvements has the potential to damage the soil resources but these adverse effects would be largely mitigated by implementing BMPs. Range improvement soil and water conservation practices, identified in the BMPs, provide guidance on site evaluation, site preparation, and erosion control measures as a means to minimize soil damage to soil productivity.

Alternative 2, No Grazing:

There would likely be no impacts to the soil resources from range improvement installation and maintenance because these improvements would be unlikely to occur. The removal of existing range improvements has the potential to negatively impact the soil resources but these impacts would be largely mitigated by implementing BMPs. Range improvement soil and water conservation practices, identified in the BMPs, provide guidance on site evaluation, site preparation, and erosion control measures as a means to minimize damage to soil productivity.

Ross Flat Watershed Improvement

Ross Flat is located on the south central portion of the West pasture in TES 481. The proposed soil stabilization treatments would reconstruct and/or maintain existing erosion control structures and potentially expand erosion control measures to stabilize active gullying. The following soil and water conservation practices may be implemented to stabilize gullies and decrease unacceptable soil loss and sedimentation.

- Ripping and/or scarifying soils
- Re-contouring the landscape associated with gullies
- Contour furrowing or pitting the landscape influencing the gullies
- Seeding, mulching, water bars, installing wattles, micorrhizae inoculation, and/or fertilization.

- Constructing and reconstructing erosion control structures, check dams, revetments, and or water spreaders.

In addition, the enclosure fence would be reconstructed and modified to continue to protect compacted and unstable soils and provide livestock water.

Alternative 1, Proposed Action:

Soil conservation practices and erosion control measures would assist in expediting soil stabilization and soil function recovery. Measures would promote an increase of vegetation ground cover in selected areas (e.g. reseeding, mulching, etc.,) promote infiltration, minimize concentrated run-off, and alleviate active headcutting and lateral and vertical instability.

The enclosure fencing with livestock watering access would protect the soils from concentrated livestock impacts. The lack of concentrated livestock load bearing stress and retention of biomass and organic matter due to no livestock use would promote soil compaction recovery and soil structure improvement. This would improve infiltration, decrease run-off, and contribute to alleviating soil instability.

Alternative 2, No-Grazing:

No enclosure fence construction would be needed in the absence of livestock grazing. Soil stabilization improvement without livestock use would be greater than with livestock use because no load bearing impacts would occur and vegetation biomass and organic matter would be retained on the soils for nutrient cycling, hydrologic function, and contribution to stabilization processes. Erosion control structures may or may not be implemented depending on whether the deciding official chooses to implement that element of Alternative 1 or not. If no erosion control measures are implemented there would not be expedited recovery of soil stabilization and soil function that would be realized through such practices as land contouring, gully stabilization, seeding, and mulching. Without erosion control structures implemented active gullying would continue to a greater extent than Alternative 1.

Cumulative Effects on Soil Resources

The cumulative effects analysis area for the soil resource consists of the Walnut Grove Allotment. The soil resource will be affected by those activities occurring on it, not from activities occurring outside the project area. Past activities and events that affected soil include past livestock grazing, roads, dispersed recreation, and past wildfires. Activities that can affect soils such as mining, vegetation treatments, prescribed burning, and timber sales have occurred within the 5th level watershed containing this allotment, but forest records and field reconnaissance show that none of these activities have happened within the allotment boundaries.

Historically, livestock grazing levels exceeded sustainable levels which resulted in decreased vegetative cover and therefore an increase in erosion. It also increased soil compaction which reduced productivity. These conditions are currently improving and, under the proposed action, are expected to continue to improve. There are approximately 8 miles of roads on the allotment. These roads continue to contribute to some soil erosion, but the effects are not changing and have little impact on the overall condition of the soils and on the watershed. The few areas where dispersed camping has occurred in the past are alongside system roads and consist of small camps that may be used for hunting. The soil can become compacted and devoid of vegetation in dispersed camping sites, which reduces soil hydrologic function and productivity. These camping sites are usually less than 30 feet in circumference and constitute a minor

portion of the project area, and as such, have little impact on the soil condition of the allotment as a whole. There was one wildfire, the Battle Fire, which occurred in 1972 and burned approximately 700 acres within the allotment. The effects to soil that may have occurred from this fire have been negated over time, and any minor continuing effects are considered part of the baseline conditions.

Besides ongoing grazing, continued use of system roads, and dispersed recreational use, there are no known planned future actions for the allotment. The activities affiliated with the Walnut Grove Allotment Proposed Action, when added to the other activities impacting the soil resource on the allotment, would not result in significant cumulative effects to the soil resources. For a complete discussion of the impacts of activities within the 5th level Upper Hassayampa watershed, see the Soil and Watershed Cumulative Effects report, project record #31. The four 6th level watersheds that include the Walnut Grove Allotment were also evaluated for past, present and future activities and the cumulative effects to soil and watersheds of those activities when added to project actions. This additional report is found in the project record at # 51.

Water and Riparian Areas

Existing Condition:

The Walnut Grove Allotment is within the Crooks Canyon, Milk Creek, Blind Indian Creek, and Moore Spring watersheds, all of which are within the Upper Hassayampa River watershed which drains through the Middle and Lower Hassayampa watersheds to the Gila River near Buckeye. Crooks Canyon and Milk Creek are the primary drainages with Crooks Canyon flowing for approximately 4 miles within the allotment to its confluence with Milk Creek. Milk Creek then flows for approximately 2.3 miles to the allotment and the Prescott National Forest boundary, then another 3.2 miles to its confluence with Hassayampa Creek.

The streamcourses are heavily influenced by the geology of both the upstream watersheds and the settings through which they pass. Both Crooks Canyon and Milk Creek are intermittent within the allotment, which means they flow for several months each year, as opposed to ephemeral which flow only in response to storm or snowmelt events. Streamflow is highly variable from season to season and year to year and during low flow periods varies within the length of the streamcourse. Short segments in the drainages immediately downstream from springs may be perennial, or are intermittent but with a shorter period of no surface flow.

Riparian vegetation along the streamcourses is primarily woody species. Fremont cottonwood and willow are present in scattered reaches, primarily in the East Pasture along Crooks Canyon and along Milk Creek in the West Pasture. Woody species such as desert willow and seep willow that are less dependent upon constant flowing water are common along Crooks Canyon in the West Pasture. Herbaceous vegetation along the streambank is generally limited and is predominantly facultative species such as deergrass and, in some locations, Bermuda grass. Where springs are present and more dependable water flow is present there are reaches with water-dependent herbaceous species such as sedges and rushes along the water's edge.

Two springs with historic development for livestock water are present – Deer Spring within the East Pasture and Ross Spring within the West Pasture. At Deer Spring, the spring collection area and nearby associated vegetation are fenced for protection and the pipeline delivery system to a trough outside the fenced area is functional. Ross Spring collection and delivery facilities are no longer present and the riparian vegetation is lacking an herbaceous component. In addition, headcutting moving up the channel from downstream is affecting local aquifer function. Carter Spring, in the southern edge of the West Pasture, is a seep out of bedrock into

a channel. It is not developed but has been receiving livestock use. All three of the springs have flows fluctuating with annual and seasonal precipitation.

Riparian areas are in mixed condition. Crooks Canyon within the East Pasture was assessed as being in Proper Functioning Condition. Although there is a heavy bedload due to the geologic setting, including areas of badlands topography within its watershed, the channel is competent to move the sediment without significant aggradation or degradation. In the West Pasture, Milk Creek was assessed as Functional – At Risk, with trend not apparent. Deer Springs and its associated riparian vegetation are in satisfactory condition. Ross Spring is lacking herbaceous vegetation and channel incision is affecting its local aquifer, but this spring will be fenced from livestock access as part of the proposed action. At Carter Spring the herbaceous component is reduced as compared to adjacent ungrazed segments and as such has a reduced ability to trap sediment as compared to its site potential. Recent field visits have shown that the herbaceous vegetation, mainly deergrass, has improved in vigor and canopy cover over the last year.

Water Quality:

The Clean Water Act requires the Arizona Department of Environmental Quality (ADEQ) to conduct a comprehensive analysis of surface water quality every two years to determine if water quality standards are being met and designated uses are being supported. The Hassayampa River downstream from the allotment has been assessed as meeting the standards for designated uses. The 20-mile segment from Copper Creek to Blind Indian Creek was sampled between 2000 and 2005. This included samples at the mouth of Milk Creek and below the confluence with Milk Creek. The sampling indicated attainment of water quality standards for all beneficial uses (ADEQ, 2008). Copper Creek is approximately 17 miles upstream from the confluence of Milk Creek with the Hassayampa. The upstream portion of the Hassayampa River from its headwaters to Copper Creek has been designated as impaired and a TMDL assessment prepared due to both metals – cadmium, copper, and zinc -- and pH, as a result of historic mining operations in, and draining into, the Hassayampa River. Streamflow from the allotment does not affect the upstream impaired water reaches.

Direct & Indirect Effects on Water and Riparian Areas

Effects Common to All Alternatives:

Neither alternative is expected to affect water yield. Research in Arizona on water yield as affected by management activities has found temporary increases in water yield from vegetative overstory (e.g., ponderosa pine or interior chaparral) removal or significant modification (Baker 1999). Neither the proposed action nor the no grazing alternative will modify the vegetative overstory.

Alternative 1 - Proposed Action

Alternative 1 utilizes adaptive management with the flexibility to adjust to variable climatic conditions, using monitoring as a feedback on the combined effect of livestock management and environmental variables. This flexibility is particularly important in light of the high degree of variability of seasonal and annual precipitation and its effects on both the upland vegetation providing soil and watershed protection and to the riparian vegetation along streamcourses.

The alternative incorporates Best Management Practices specified as resource protection guidelines which should result in vegetative improvement in both the uplands and riparian areas. Application of the stubble height guidelines for herbaceous vegetation in riparian areas will facilitate the reaches with hydrophytic species along the greenline to entrap sediment and

build streambanks; thus adding to their soil water storage capacity and vegetative production potential. Reconfiguring of the fence protecting the Ross Flat erosion control project will facilitate more rapid vegetative recovery, which in turn will lead to less potential soil erosion and improved watershed condition.

Fencing of Ross Spring and its associated riparian area will allow natural processes to move the area toward recovery. Bank disturbance from livestock will be eliminated and native herbaceous plants should increase. However, the incised channel will delay full recovery unless additional measures are taken to halt incision and facilitate aggradation of the channel base level with a portion of the sediment which moves through it. Resource protection measures for Carter Spring will provide for greater entrapment of sediment by the herbaceous vegetation – primarily deergrass – and increased soil moisture capacity with accompanying increased vegetation capability.

Effects of the constructed improvements will be localized and temporary. Use of UTVs for access and delivery of fencing materials at Ross Spring, Ross Flat erosion control area (and Carter Spring if necessary) will cause relatively little surface soil disturbance due to the low bearing weight and the amount of rock on the soil surface. No new road construction is required for maintenance and reconstruction of existing water development facilities. Access during times when soils are not saturated will limit effects.

Effects to on-site (within allotment) water quality will be to reduce sediment and turbidity due to reduced soil erosion. This effect will continue to the Hassayampa River downstream. However, for perspective, the allotment comprises only 4 percent of the watershed area of the Upper Hassayampa River 5th level HUC. As displayed under Existing Condition, the segment of the Hassayampa River into which Milk Creek empties has been assessed as currently meeting standards for designated uses.

Alternative 2 – No Action/No Grazing Alternative

The No Grazing Alternative eliminates the direct effects of livestock grazing to the upland watershed areas and to stream courses and riparian areas in the Walnut Grove Allotment. It will result in slightly more rapid vegetative recovery in the upland areas than Alternative 1 and more rapid herbaceous recovery of hydrophytic species along the greenline, where present, and with some gradual expansion expected. Areas having the greatest current upland impact, e.g., TES Unit 370, will be slow to achieve vegetative recovery and soil stability, due to precipitation being low and highly variable, reduced soil productivity due to partial loss of the A horizon, and to the current lack of perennial graminoid plants.

No range improvements would be constructed, so there would be no effect on water quality from construction activities. Without grazing, more vegetation and litter cover will be retained to protect soil from erosion resulting in reduced sediment and turbidity. There will likely be less sediment generated under this alternative as compared to alternative 1, but the degree of difference would be slight.

Cumulative Effects on Water and Riparian Areas

The cumulative effects analysis area consists of the Upper Hassayampa River 5th level watershed (see map in Appendix 5). The past, present, and reasonably foreseeable future activities and events that may affect water resources and riparian areas include past livestock grazing, roads, dispersed recreation, fire and fuels treatment, timber and fuelwood sales, past

wildfires, and mining activities. For a complete discussion of the impacts of activities within the watershed, see the *Soil and Watershed Cumulative Effects* report, Project record #34.

Water Quantity and Timing

Because there are no direct or indirect effects to water quantity there would be no cumulative effects. The minimal effects to low flows and peak flow volumes through increased building of streambanks and increased bank storage will be very localized and the primary benefits will be local enhanced riparian and aquatic habitat. Downstream effects below the project area are expected to be negligible.

Water Quality

The Hassayampa River within the Cumulative Effects Analysis Area is in two primary segments for water quality assessment. From the headwaters to Copper Creek was assessed as impaired and a TMDL was prepared for cadmium, copper, and zinc. In addition, low pH has been identified as an impairment. However, the 2008 Status of Ambient Surface Water in Arizona, Arizona's Integrated 305(b) report and 303(d) Listing Report (ADEQ 2008) states that actions to reduce metal loads will also address the low pH and development of a specific TMDL for pH is a low priority.

From Copper Creek to Blind Indian Creek water quality was assessed as meeting the standards for all designated uses. This segment is downstream from the headwaters to Copper Creek segment and it did not have an impairment for metals and pH as did the upstream reach. It is also the segment within which waters from the allotment discharge into the Hassayampa River via Milk Creek and Blind Indian Creek.

Conclusion

In summary, the proposed project would incrementally improve the cumulative effects because it would result in a net improvement of the soil and water resources. Any potential adverse impacts to the soil and water resources due to the construction and reconstruction of range structural improvements would be temporary, localized, and would be mitigated by implementing soil and water conservation practices (BMPs). The activities affiliated with the Walnut Grove Allotment would not add to the cumulative watershed effects of the other listed actions because of the net improvement upon the soil, vegetation, and water resources; the large size of the watershed compared to the small size of the allotment and because sources of existing impairments in the upstream watershed are not related to products of this proposal. This project would neither reduce nor add to current impairments nor would it create future impairments.

Wildlife, Aquatic Species, and Rare Plants _____

Wildlife Habitat:

The majority of the Walnut Grove Allotment falls within the pinyon-juniper woodland ecotype, with a small portion in the East Pasture at the higher elevations supporting chaparral vegetation, and lower elevations on the West Pasture supporting small portions of desert shrub/grassland ecotypes. Springs (both developed and natural), ephemeral and intermittent drainages, trick tanks, and approximately 130 acres of wetland/riparian systems (polygons) delineated by US Fish & Wildlife Service and included in the National Wetlands Inventory are located within the allotment and are used by both wildlife and livestock. Riparian/aquatic habitat within the project area is located along the main drainages of Milk Creek and Crooks Canyon and at several springs. The drainages are mainly intermittent with flow occurring during the winter period.

Direct & Indirect Effects on Wildlife, Aquatics, and Rare Plants:

Grazing domestic livestock has the potential to directly affect wildlife habitat by the removal of plants through herbivory. Plants grazed by cattle can be a forage source for wildlife species or their prey. Herbaceous plants can provide cover for small species such as rodents, reptiles, and birds. Cattle may directly impact nests for ground-nesting birds through trampling. The Prescott National Forest (PNF), Bradshaw Ranger District, proposes to continue to authorize livestock grazing on the Walnut Grove Allotment in a manner consistent with the Forest Plan and to apply adaptive management principles to management of the allotment. The Wildlife, Fish, and Rare plant report documents the effects of the proposed action and the no action alternatives on plant and animal species that have the following status: Federally listed under ESA (Endangered Species Act), Regional Forester sensitive species, and Prescott National Forest MIS (Management Indicator Species). This report also considered any designated critical habitat that may occur or be impacted by actions in the project area. The best available science was used in the completion of this report. Upon review of PNF habitat data and meeting with staff biologists, it was determined that species Federally listed under the Endangered Species Act (ESA), their designated or proposed critical habitat, and species proposed for listing/candidates for listing do not occur in the project area. The following tables summarize the effects determinations for Regional Forester sensitive species and MIS species, respectively.

Summary of effects for Region 3 Forest Service Sensitive species for the Walnut Grove Livestock Grazing Project

Species Name	Status	Alternative 1 Proposed Action	Alternative 2 No Action
Common Black Hawk	Sensitive	MIH1	No Impact
Abert’s Towhee	Sensitive	MIH	No Impact
Western red bat	Sensitive	MIH	No Impact
Pocket free-tailed bat	Sensitive	MIH	No Impact
Pale Townsend’s big-eared bat	Sensitive	MIH	No Impact
Peregrine falcon	Sensitive	MIH	No Impact
Arizona toad	Sensitive	MIH	No Impact
Lowland leopard frog	Sensitive	MIH	No Impact
Desert sucker	Sensitive	MIH	No Impact
Longfin dace	Sensitive	MIH	No Impact
Metcalfe’s tick-trefoil	Sensitive	MIH	No Impact
Broad-leafed lupine	Sensitive	MIH	No Impact

MIH = May impact individuals or habitat but is not likely to result in a trend towards Federal listing or loss of viability for the species.

Federally listed Threatened or Endangered plants and animals, species proposed for listing, candidates for listing, and critical habitat:

Species Federally listed under the Endangered Species Act (ESA), their designated or proposed critical habitat, and species proposed for listing/candidates for listing do not occur in the project area. The Wildlife, Fish, and Rare Plant Report for the Walnut Grove Allotment contains further details regarding the species considered and the analysis conducted for this project.

Region 3 Regional Forester Sensitive Animal Species:

Twelve Regional Forester Sensitive Species and/or their suitable habitat are present within the Walnut Grove Allotment. The implementation of the alternatives considered in this analysis may

affect individuals or habitat of these species but will not affect the viability of these species or result in trends toward Federal listing for any. Details on the habitat used by each species and their presence in the analysis area are provided in the specialist's report (project record #37). The following table lists the Regional Forester sensitive species that may occur in the project area and the habitat in which they are likely to occur.

Species Name	Status	Habitat association
Common Black Hawk	Sensitive	Riparian/aquatic
Abert's Towhee	Sensitive	Lowland riparian thickets
Peregrine falcon	Sensitive	Nests on cliffs
Western Red Bat	Sensitive	Riparian
Pale Townsend's big-eared bat	Sensitive	Abandoned mines for roosting
Pocket free-tailed bat	Sensitive	Arid lower elevations usually around high cliffs and rugged rock outcrops.
Metcalf's tick-trefoil	Sensitive	Oak/ pinyon woodlands
Broad-leafed lupine	Sensitive	Moist places in woods, shady to open areas, many plant communities between 4800 and 7000',
Arizona toad	Sensitive	Aquatic
Lowland leopard frog	Sensitive	Aquatic
Desert sucker	Sensitive	Aquatic
Longfin dace	Sensitive	Aquatic

Management Indicator Species:

Four Management Indicator Species (MIS) designated on the Prescott National Forest have habitat within the allotment that may be affected by livestock grazing and management. These are mule deer, used as an indicator species for early seral pinyon/juniper and chaparral habitat; spotted towhee, a bird that is an indicator species for late seral chaparral; juniper titmouse, a bird species that is an indicator for late seral pinyon/juniper and the snag component; and Lucy's warbler, an indicator bird for late seral riparian habitat. The Forest-Level Analysis of Management Indicator Species for the Prescott National Forest provides background and current information for these species on the Forest (USDA Forest Service, 2009).

Summary of effects on management indicator species (MIS) analyzed on the Walnut Grove Allotment by alternative

Species – Indicator habitat	Proposed Action Alternative 1		No Action Alternative 2	
	Project Level Effects	Forestwide Trends	Project Level Effects	Forestwide Trends
Mule Deer – early seral pinyon juniper & chaparral	No change to habitat quantity of early seral stage of pinyon-juniper and chaparral vegetation. May increase habitat quality due to construction and maintenance of water developments.	No effect to forestwide habitat or population trends.	No change to habitat quantity of early seral stage of pinyon-juniper and chaparral vegetation. Habitat quality would not change continuing the current existing condition.	No effect to forestwide habitat or population trends.
Spotted Towhee – late seral chaparral	No change in habitat quantity of late-seral chaparral. Habitat quality may be impacted with short-term impact from seasonal, rotational grazing system. Soil DFCs are to improve vegetative ground cover. No direct impacts to ground nesting since grazing occurs fall/winter	No effect to forestwide habitat or population trends.	No change in habitat quantity of late-seral chaparral. Habitat quality may improve with an increase of insect species diversity and additional vegetative cover for nests; ground nests will not be trampled by livestock.	No effect to forestwide habitat or population trends.
Juniper titmouse – late seral & snag component of pinyon juniper	No change in habitat quantity of late seral stage or snag component in juniper vegetation type. Habitat quality would not change as the titmouse primarily forages in the junipers, which would not be impacted by this alternative.	No effect to forestwide habitat or population trends.	No change in habitat quantity of late seral stage or snag component in juniper vegetation type. Habitat quality would not change as the titmouse primarily forages in the junipers, which would not be impacted by this alternative.	No effect to forestwide habitat or population trends.
Lucy’s warbler – late seral riparian	No change in habitat quantity of late-seral riparian habitat. With the resource protection measures, habitat quality for this species would improve.	No effect to forestwide habitat or population trends.	No change in habitat quantity of Late-seral riparian habitat. Most rapid improvement in recruitment of riparian trees; cowbird presence may decrease.	No effect to forestwide habitat or population trends.

Migratory Birds

In accordance with the Migratory Bird Treaty Act, Executive Order 13186, and the Memorandum of Understanding with the U.S. Fish and Wildlife Service signed December 2008, this project was evaluated for its effects on migratory birds. Advice from the Regional Office is to analyze effects in the following manner: (1) effects to Highest Priority Birds listed by Partners in Flight (PIF); (2) effects to Important Bird Areas (IBAs); (3) effects to important over-wintering areas. Of the 23 AZ PIF Priority Bird Species that have the potential to occur on the Prescott National Forest (excluding species already discussed), 8 species have the potential to occur on the allotment and are shown in the table below.

Partners in Flight priority bird species and their habitat

Partners in Flight Priority Bird Species	Habitat (from AZ PIF statewide plan)
Black-chinned sparrow	Chaparral
Virginia's warbler	Chaparral
Guildded flicker	Sonoran desertscrub (desert shrub on PNF ecotype layer)
Purple martin	Sonoran desertscrub (desert shrub on PNF ecotype layer)
Gray flycatcher	Pinyon-juniper
Pinyon jay	Pinyon-juniper
Gray vireo	Pinyon-juniper
Black-throated gray warbler	Pinyon-juniper

A reduction in herbaceous vegetation can expose nests resulting in an increased chance for nest predation, nest parasitism, exposure to elements, and nest failure. There is potential for direct disturbances to nests or loss of eggs/unfledged chicks due to livestock trampling, primarily to ground nesting birds (e.g., spotted towhee and Virginia warbler); this potential should be slight as cattle will be removed before most individual birds are nesting. The same holds true for species that nest in shrubs/small trees; potential for direct disturbance through the dislodging of nests by livestock will be low. Some reduction of prey abundance associated with the grazing due to habitat changes may also occur. Potential for nest parasitism from cowbirds may increase slightly for those species that are commonly used as hosts (e.g., Virginia's warbler and Lucy's warbler).

Any adverse effects from these activities are expected to be infrequent and are not projected to rise to a level that affects the total population size for any species. Grazing could affect habitat structure and composition of prey cover, as well as the availability and diversity of prey in certain areas of the allotment. None of the proposed action would impact any snag retention (used by cavity nesting and bark foraging species) within the project area. Managing to conservative use levels should ensure that habitat structure and composition of prey cover are maintained during the breeding season.

Important Bird Areas

There are no designated IBAs found within or near the allotment. Therefore, no IBAs are affected by either alternative.

Overwintering Areas

Many important overwintering areas in Arizona are large wetlands; none of this habitat is present in the analysis area. The project area provides limited wintering habitat for migrant bird species. This area is not recognized as an important over wintering area because significant concentrations of birds are not known to occur here nor do unique or a high diversity of birds winter here.

Cumulative Effects on Wildlife, Aquatics, and Rare Plants

Projects considered for cumulative effects to wildlife and their habitat are those projects that have the potential to modify or remove vegetation, directly disturb animals by human presence or use of machinery, harm animals directly, or cause habitat fragmentation. The cumulative effects area is the Crooks Canyon, Milk Creek, and Blind Indian Creek 6th code watersheds that encompass the project area.. The table at the beginning of Chapter 3 lists thepast, present, and future activities within the 5th level watershed that includes the 3 smaller 6th level watersheds.

The past, ongoing, and future activities affecting wildlife or their habitat include wildfire suppression, timber/fuelwood sales, vegetation treatments including prescribed fire, livestock grazing, water developments, recreational activities, roads, and mining.

Livestock grazing has occurred within the project area for at least 100 years, and at times has been conducted at levels beyond sustainable capacity. This has resulted in a reduction in abundance of those plants most preferred by cattle, mainly forage grasses. The impacts of grazing on plant communities can be measured by monitoring the existing condition of the vegetation and knowing that the impacts of long-term grazing are reflected in the baseline vegetation condition. The desired conditions for vegetation are being met in the East Pasture, and in the West Pasture there is mid- to high similarity between existing and desired cover and composition of grass species except for 8% of the West Pasture where there is low similarity and poor herbaceous cover when compared to site potential. The timber and vegetation treatments that have occurred or are planned are within the watersheds, not on the allotment. These projects are small in scale when compared to the acreage in the 5th or 6th level watersheds. The impacts to habitat are not substantial because of the small scale, although vegetation treatments can improve habitat quality by improving structural diversity.

Water developments include natural springs that have been dug out and a collection box constructed to provide for water dispersal away from the spring through a pipeline, and constructed trick tanks or earthen tanks that collect overland flow. These activities on the allotment have led to indiscernible impacts to the physical structure of the habitat. Range water developments may provide for more reliable water availability and actually improve habitat in some cases. Recreational activities such as dispersed camping, hiking, hunting, and OHV use may cause trampling or removal of vegetation, compaction of soil, displacement of animals from disturbance, and altering of habitat structure. There are approximately 8 miles of roads on the allotment. Roads may impact species or habitat by causing avoidance of areas that contain roads due to noise or from mortality of animals by vehicles. Roads may cause habitat fragmentation when animals avoid using areas because of the presence of roads. The 1972 Battle Fire burned approximately 700 acres on the allotment. The effects of this fire are now likely indiscernible from adjacent unburned areas, although some vegetation structure may be slightly different in burned areas (less mature trees).

The impacts created through livestock grazing and the adaptive management associated with Alternative 1, when added to the other past, present, and future activities in the cumulative effects analysis area, do not together accumulate to levels that are considered to be significant for wildlife, fish, or rare plant resources or their habitats.

Recreation

Existing Condition:

The Prescott National Forest in this area is open (unless posted "closed") for dispersed recreation activities such as: camping, hiking, trail use, horseback riding, hunting, mountain biking, and target shooting. Motorized travel must be on designated roads and trails only (36 CFR 261.13). Estimated site visits in areas defined as "General Forest Areas" which the Walnut Grove Allotment would be categorized in, has increased by about 60% since 2002 (National Visitor Use Monitoring Results, October 2008, page 7).

There are 3 motorized trails on the allotment, the Old Bodie # 319, Blind Indian # 211, and Trail #9211. These trails do not receive frequent use, probably due to the fact that they are in a very remote location, each trailhead is hard to find, and the routes are not clearly defined.

The entire Walnut Grove Allotment is composed of two Recreation Opportunity Spectrum (ROS) categories; about 8,350 acres are classified as Semi-Primitive Motorized and about 50 acres are classified as Roaded Natural. Semi-Primitive Motorized means that a moderate probability for experiencing solitude, closeness to nature, and tranquility in a predominately natural appearing environment are likely to occur. Roaded Natural means having an opportunity to affiliate with other users in developed sites but some chance for privacy is likely. There are no designated wilderness areas on the allotment.

Inventoried Roadless Areas:

About 15% of the allotment is part of the Blind Indian Creek Inventoried Roadless Area (IRA). The entire Blind Indian Creek IRA is about 27,000 acres and 1,220 acres of the IRA falls on the east side of the Walnut Grove Allotment. Inventoried Roadless Areas are a group of National Forest System lands that were identified by government reviews in 1979 as lands without existing roads that could be suitable for Roadless Area Conservation. Existing trails, either motorized or non-motorized, are allowed in I.R.A. s.

Wild and Scenic Rivers:

A 40-mile section of the Verde River has been classified as a Wild and Scenic River (W&SR). The Walnut Grove Grazing Allotment is about 55 miles west from the section of the Verde River that is designated as a W&SR and the allotment would not affect the W&SR characteristics in this section of the Verde River.

Direct & Indirect Effects on Recreation:

Alternative 1 - Proposed Action

The purpose and need for this proposed action is to continue to authorize livestock grazing on the Walnut Grove Allotment in a manner consistent with the Forest Plan. Livestock are currently authorized in the project area and there have been no documented reports of conflicts or concerns from recreational users related to the presence of livestock. The presence of livestock would continue to be observed by recreational users under this alternative. Range improvements would be maintained, and new ones built, that will be visible to forest users. Water developments may provide additional watering sources for recreational horseback riders. Recreational opportunities (dispersed camping, hiking, biking, horseback riding, recreational driving and other recreation activities) and recreation planning would not be adversely affected by re-authorizing livestock grazing on the Walnut Grove Allotment. No new roads or trails will be developed as part of this alternative, so the characteristics of the existing Inventoried Roadless Area will be maintained.

Alternative 2 – No Action/No Grazing Alternative

Most recreationists involved with various recreational activities (camping, hiking, biking, horseback riding, recreational driving and other recreation activities) would not notice a difference if cattle were no longer on the Walnut Grove Allotment.

Cumulative Effects on Recreation Resources

There would be no negative impacts or changes to recreation resources by re-authorizing Walnut Grove livestock grazing, so there are no cumulative impacts to this resource from this project.

Heritage

Existing Condition:

Based on the PNF heritage resource atlas and files, heritage specialists and para-archaeologists have conducted 13 heritage resource inventories within the allotment. The majority of the projects were small in size and were conducted prior to the implementation of mining projects (6), range projects (4), a watershed project (1), and road maintenance or closure projects (2). Of these 13 projects, 5 inventories conducted by para-archaeologists and occurring prior to 1988 do not meet the current heritage inventory standards and will not be included in this analysis. No heritage sites were identified in those 5 inventories. Based on the 8 inventories occurring between 1988 and 1999, only 51 acres have been intensively inventoried for heritage resources within the allotment. The heritage reports are on file in the Forest Heritage Resource Section at the PNF Supervisor's Office. A records search of the PNF heritage atlas and files has revealed that only 1 site has been identified and documented within the allotment based on prior surveys.

The Proposed Action calls for the reconstruction of several water developments and the construction of new fencing at Ross Spring, Ross Flat Watershed, and potentially at Carter Spring. These proposed range improvement projects identified as part of the proposed action were surveyed for heritage resources in November 2010, resulting in intensive survey of an additional 151.9 acres which brings the total acreage surveyed to 203 acres or almost 2.5% of the pastures. The total number of heritage surveys increase from 8 to 16 which are documented in 9 reports and the total number of known heritage sites increases to 6.

Direct & Indirect Effects on Heritage Resources:

Alternative 1 - Proposed Action

It has been documented in the PNF range files that this area of the Bradshaw Ranger District has been grazed by livestock for over 90 years and at numbers higher than current levels. The Forest Service's permit for livestock grazing does not recommend changing to a more intensive grazing system nor does it recommend increasing the number of livestock. The term grazing permit will be issued for 182 days between the periods of September 1st through April 15th. Livestock numbers would range from 23 to 100 head of cattle, cow/calf pairs and bulls, for 6 months. Heritage surveys of proposed range projects that are scheduled to be implemented within the next 2 years have been conducted and the proposed projects will have a no effect on the 6 known heritage sites. In the future, if additional range improvements or other ground disturbing management practices are necessary, the Forest Service will complete the appropriate heritage surveys and/or reports as outlined in our Region 3 Programmatic Agreement Regarding Historic Property Protection and Responsibilities and be in compliance with all applicable provisions of Section 106 of the NHPA. Heritage resource specialists have recently inspected or recorded the 6 known sites and they documented that grazing was not adversely affecting the sites. Sites that may be more sensitive to grazing such as Traditional Places (TCP), pictograph/petroglyph sites, rock shelters/caves, or ruins with free-standing walls have not been documented within the pastures. The Forest Service will consult with the SHPO

on the effects of livestock grazing on heritage resources prior to the signing of the EA. Continued livestock grazing is not expected to significantly impact heritage resource sites.

The Forest Service's proposal to continue livestock management as proposed under this alternative is considered to have a no adverse effect on the heritage resource sites located within the allotment.

Cumulative Effects of Alternative 1

Past, present, and reasonably foreseeable future actions on the allotment have been considered as part of this cumulative impacts analysis. Authorization of livestock grazing along with the past, present, and reasonably foreseeable future actions, would have minimal cumulative effects on heritage resource sites.

Alternative 2 – No Action/No Grazing Alternative

If livestock grazing is not authorized then there would be no direct or indirect effects on heritage resource sites.

Cumulative Effects of Alternative 2

Since no direct or indirect effects are anticipated, there would be no cumulative effects.

Monitoring Recommendations

Heritage specialists will periodically monitor known heritage properties to assess their condition.

CHAPTER 4 – Coordination and Agencies Consulted

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

Core Interdisciplinary Team Members

Chris Thiel	ID Team Leader/ Writer / Editor
David Moore	Forest Soil Scientist
Ed Holloway	Range Management Specialist
Lloyd Barnett	Contract Hydrologist

Extended Team Members

Albert Sillas	Aquatic Biologist
Bill Falvey	TEAMS Wildlife Biologist
Debra Crisp	Botanist
Dorothy Baxter	Recreation Planner
Elaine Zamora	Archeologist
Linda Jackson	Bradshaw District Ranger
Nancy Walls	Forest Natural Resources Staff Officer
Thomas Potter	GIS Coordinator

Allotment Permit Holders

Stella Byrd Carter Trust, Tripp Carter

Federal and State Agencies

AZ Department of Environmental Quality, Northern Regional Office
AZ Game and Fish Department
AZ State Historic Preservation Office
US Fish and Wildlife Service, AZ Ecological Services Office

Tribes

The Fort McDowell Yavapai Nation
The Hopi Tribe
The Hualapai Tribe
The Tonto Apache Tribe
The Yavapai-Apache Nation
The Yavapai Prescott Tribe

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APPENDICES

Appendix 1 - Allotment Map

Appendix 2 - Actual Use Table

Appendix 3 - List of Existing Improvements

Appendix 4 – Glossary of Terms

Appendix 5 – Cumulative Effects Area Map

Appendix 1 – Allotment Map (See following pages)

See Allotment Proposed Action Map on the preceding page.

Appendix 2 - Actual Use Tables

Walnut Grove Allotment

Actual Use Table*:

Walnut Grove Allotment**

Graze year	A.U.M
1990	800
1991	900
1992	700
1993	200
1994	300
1995	600
1996	500
1997	600
1998	600
1999	600
2000	600
2001	600
2002	540
2003	340
2004	420
2005	420
2006	480
2007	400
2008	N/A
Low	200
High	900
Average	533

* Authorized use, actual use, when available, and billing data are maintained in the 2200 Range Files on the District and are hereby incorporated by reference.

** Billed number instead of permittee-reported actual use

Appendix 3 - List of Existing Improvements

Walnut Grove Allotment:

Linear Range Improvements (fence and pipeline)

TYPE	Improvement Number	Feet	Miles
DISTRIBUTION PIPELINE	0020H7A	469.2	0.1
RANGE, ALLOTMENT INTERIOR	002H14	8315.9	1.6
FENCE	002H14	7938.0	1.5
RANGE, ALLOTMENT BOUNDARY	R02D04	9225.3	1.7
RANGE, ALLOTMENT BOUNDARY	003K21	28190.8	5.3
RANGE, ALLOTMENT BOUNDARY	R02G08	962.8	0.2
RANGE, ALLOTMENT BOUNDARY	R02H02	18309.8	3.5
RANGE, ALLOTMENT BOUNDARY	002H00	7212.1	1.4
RANGE, ALLOTMENT BOUNDARY	002H03	11049.1	2.1
RANGE, ALLOTMENT BOUNDARY	R02F07	4113.3	0.8
RANGE, ALLOTMENT BOUNDARY	R02F18	21993.5	4.2
TOTAL		117779.8	22.3

Range Improvement points (water and facilities).

Range Improvement Name	Improvement No.	Improvement Type
West Trick Tank	002H17	Trick Tank
Deer Trick Tank	002H15	Trick Tank
Ross Spring	002H10	Spring
Deer Spring	002H07	Spring
Crooks Corral	002H08	Corral
Storage Tank	002H18	Storage Tank
Milk Creek Corral	002H09	Corral
South Trick Tank	002H12	Trick Tank
Watershed Storage Tank	002H13	Storage Tank
South Tank	002H04	Tank
Upper Tank	002H05	Tank
Lower Tank	002H06	Tank
Deer Trick Tank	002H16	Storage Tank
Water Trough		Trough

Appendix 4 – Glossary of Terms

Adaptive Management- A formal, systematic, and rigorous approach to learning from the outcomes of management actions, accommodating change, and improving management. It involves synthesizing existing knowledge, exploring alternative actions and making explicit forecasts about their outcomes.

Allotment Management Plan (AMP) - An Allotment Management Plan (AMP) is unique, and is based on the individual landscape and ranch operation and will be modified with modification or issuance of a new permit following a NEPA decision to ensure consistency with the NEPA decision. The AMP must be included in Part 3 of the term grazing permit. The Sycamore Allotment must maintain a current AMP developed within the bounds of the NEPA based decision (USDA 2007).

Animal Month (AM) - A month's use and occupancy of rangeland by a single animal or equivalent.

Animal Unit Month (AUM) – The quantity of forage required by one mature cow (1,000 pounds) or the equivalent for 1 month; approximately 26 lbs of dry forage per day is required by one mature cow or equivalent.

Annual Operating Instructions (AOI) - Instructions developed a guideline for grazing management by the agency and livestock permittee for implementing grazing management activities on a specific allotment for a specific grazing season.

Aquatic – Pertaining to standing and running water in streams, rivers, lakes and reservoirs.

Browse – Young twigs and leaves of woody plants consumed by wild and domestic animals.

Candidate Species- Plants and animals for which the U.S. Fish and Wildlife Service (FWS) has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act (ESA), but for which development of a proposed listing regulation is precluded by other higher priority listing activities.

Community Type – Community types represent existing vegetation communities that do not currently reflect potential due either to disturbance or natural processes related the development of the community. Vegetation may be disturbed by a number of factors including: grazing, fire, and other activities.

Critical Habitat – That portion of a wild animal's habitat that is critical for the continued survival of the species as declared by the Secretary of the Interior.

Cultural Resource – The physical remains of past human cultural systems and places or sites of importance in human history or prehistory.

Desired Conditions- Descriptions of the social, economic and ecological attributes that characterize or exemplify the desired outcome of land management. They are aspirational and likely to vary both in time and space.

Dispersed Recreation – In contrast to developed recreation sites (such as campgrounds and picnic grounds) dispersed recreation areas are the lands and waters under Forest Service jurisdiction that are not developed for intensive recreation use. Dispersed areas include general undeveloped areas, roads, trails and water areas not treated as developed sites.

Ecological Type – Ecological types are derived directly from the TES document and describe the potential vegetation for a particular soil type. The potential vegetation was defined through intensive field sampling. See the Terrestrial Ecosystem Survey Handbook, USDA 1986 for a full description of how potential vegetation descriptions were derived.

Endangered Species – Any species that is in danger of extinction throughout all or a significant portion of its range, as declared by the Secretary of the Interior.

Environmental Analysis – An analysis of alternative actions and their predictable short- and long-term environmental effects, including physical, biological, economic and social effects.

Environmental Assessment – The concise public document required by regulations for implementing the procedural requirements of NEPA (40 CFR 1508.9).

Ephemeral – A stream that flows only in direct response to precipitation, and whose channel is above the water table at all times.

Erosion – The wearing away of the land's surface by running water, wind, ice or other geological agents. Erosion includes detachment and movement of soil or rock fragments by water, wind, ice or gravity.

Forage – All non-woody plants (grass, grass-like plants and forbs) and portions of woody plants (browse) available to domestic livestock and wildlife for food.

Forage Utilization – The portion of forage production by weight that is consumed or destroyed by grazing animals. Forage utilization is expressed as a percent of current year's growth.

Forest Plan – A document, required by Congress, assessing economic, social and environmental impacts, and describing how land and resources will provide for multiple use and sustained yield of goods and services.

Grazing Capacity – The maximum level of plant utilization by grazing and browsing animals that will allow plants or associations of plants to meet their physiological and/or reproductive needs.

Grazing Period - The length of time grazing livestock or wildlife occupy a specific land area.

Grazing Permittee – An individual who has been granted written permission to graze livestock for a specific period on a range allotment.

Greenline – The first perennial vegetation that forms a lineal grouping of community types on or near the water's edge. (USDA Forest Service Gen. Tech. Rep. RMRS-GTR-47, 2000)

Gully Erosion – The erosion process whereby water accumulates in narrow channels and, over short periods, removes the soil from this narrow area to depths ranging from several feet to as much as 75 to 90 feet.

Habitat – The sum total of environmental conditions of a specific place occupied by a wildlife species or a population of such species.

Hydrophytic species – A plant species found growing in areas where soils in the rooting zone are saturated much or all of the growing season.

Impaired Soil Condition – Indicators signify a reduction in soil function. The ability of the soil to function properly and normally has been reduced and/or there exists an increased vulnerability to degradation. Changes in land management practices or other preventative measures may be appropriate.

Improvement – Manmade developments such as roads, trails, fences, stock tanks, pipelines, power and telephone lines, survey monuments and ditches.

Incidental Use - Incidental Use targets the lower range of the Light Use (0-30%) category in all seasons by applying such practices as herding or by limiting where livestock attractants such as salt or water are placed relative to the area of concern.

Indicator Species – A wildlife species whose presence in a certain location or situation at a given population level indicates a particular environmental condition. Population changes are believed to indicate effects of management activities on a number of other wildlife species.

Instream Flows – Those necessary to meet seasonal streamflow requirements for maintaining aquatic ecosystems, visual quality and recreational opportunities on National Forest lands at acceptable levels.

Interdisciplinary (ID) Team– A group of individuals with skills from different resources. An interdisciplinary team is assembled because no single scientific discipline is sufficient to adequately identify and resolve issues and problems. Team member interaction provides necessary insight to all stages of the environmental analysis process.

Intermittent (or Seasonal Stream) – A stream that flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas.

Issue – a point of discussion, debate, or dispute with a Proposed Action based on some anticipated effect.

Key Area - A relatively small portion of a range selected because of its location, use or grazing value as a monitoring point for grazing use.

Management Indicator Species – See "Indicator Species."

Mesa – A tableland; a flat-topped mountain or other elevation bounded on at least one side by a steep cliff.

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

National Environmental Policy Act (NEPA) – An act to declare a National policy that will encourage productive and enjoyable harmony between man and his environment; to promote efforts that will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation and to establish a Council on Environmental Quality.

National Forest System Land – National forests, national grasslands and other related lands for which the Forest Service is assigned administrative responsibility.

NEPA- See “National Environmental Policy Act”

Perennial Stream – A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.

Permitted Grazing – Authorized use of a National Forest range allotment under the terms of a grazing permit..

Proper Functioning Condition (PFC) - A methodology for assessing the physical functioning of riparian and wetland areas. The term PFC is used to describe both the assessment process, and a defined, on-the-ground condition of a riparian-wetland area. PFC evaluates how well the physical processes are functioning through use of a checklist.

Proper Functioning Condition (PFC) Assessment - Provides a consistent approach for assessing the physical functioning of riparian-wetland areas through consideration of hydrology, vegetation, and soil/landform attributes. The PFC assessment synthesizes information that is foundational to determining the overall health of a riparian-wetland area.

Proposed Action – In terms of the National Environmental Policy Act, the project, activity or action that a Federal agency intends to implement or undertake and that is the subject of an environmental assessment.

Range Allotment – A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under a range allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System and associated lands administered by the Forest Service.

Range Condition – The state of health of a range land site based on plant species composition and forage production in relation to the potential under existing site conditions. Range condition is rated as satisfactory or unsatisfactory.

Riparian – Land adjacent to perennial and intermittent streams, lakes and reservoirs. This land is specifically delineated by the transition ecosystem and defined by soil characteristics and distinctive vegetation communities that require free and unbound water.

Satisfactory Soil Condition – Indicators signify that soil function is being sustained and soil is functioning properly and normally. The ability of the soil to maintain resource values and sustain outputs is high.

Sheet Erosion – The removal of a fairly uniform layer of soil from the land surface by rainfall and runoff water without the development of conspicuous water channels.

Soil Erosion – The wearing away of the land surface by running water, wind, ice or other geological agents, including such processes as gravitational creep. Detachment and movement of soil or rock by water, wind, ice or gravity.

Soil Productivity – The capacity of a soil in its normal environment to produce a specified plant or sequence of plants under a specified system of management.

Species Composition – Species composition refers to a descriptive list of species that together make up a given ecological community.

Species Diversity – Diversity refers to the measure of composition for a given community and is also referred to as species richness.

Stream Reach - the length of the stream selected for monitoring.

Structural Range Improvement – Any type of range improvement that is manmade (e.g., fences, corrals, water developments).

Suitable Range – Range which is accessible to livestock or wildlife and which can be grazed on a sustained yield basis without damage to other resources.

Terrestrial Ecosystem Survey (TES) - consists of the systematic analysis, classification and mapping of terrestrial ecosystems. It describes and maps the soils and potential vegetation (ecological types). This Ecological Classification describes the existing vegetation (community types) associated with the ecological map units.

Threatened Species – Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Travelway - Any transportation facility that allows vehicle passage of any sort, that came into existence without plans, design or standard construction methods, that is not maintained or signed and has a very low traffic volume.

Trend- The direction of change in an attribute as observed over time.

Unsatisfactory Soil Condition – Indicators signify that a loss of soil function has occurred. Degradation of vital soil functions results in the inability of the soil to maintain resource values, sustain outputs or recover from impacts. Unsatisfactory soils are candidates for improved management practices or restoration designed to recover soil functions.

Utilization- The proportion or degree of the current year's forage production that is consumed or destroyed by animals (including insects). The term may refer either to a single plant species, a group of species, or to the vegetation community as a whole.

Vegetation Spatial Distribution – The arrangement of vegetation across the ground surface that can influence how water flows over the soil, and how susceptible the soil surface is to wind erosion. Vegetation that is dispersed evenly forms a physical barrier to overland water flow so that more water can infiltrate the soil instead of running off site. Well dispersed vegetation will also slow surface wind speed and decrease the erosive force of wind to carry soil particles off site.

Watershed – The entire area that contributes water to a drainage or stream.

Watershed Condition – A description of the health of a watershed in terms of the factors that affect the hydrologic function and soil productivity.

Wildlife Habitat – The sum total of environmental conditions of a specific place occupied by a wildlife species or a population of such species.

Appendix 5 - Cumulative Effects Area Map for the 5th Code Watershed Containing the Project Area

