



United States
Department of
Agriculture

Forest
Service

Southwestern
Region

September
2012



Environmental Assessment

Wagoner Grazing Allotment Management

**Bradshaw Ranger District, Prescott National Forest
Yavapai County, Arizona**



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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 Wagoner 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. 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 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. Chapter 3 provides a more detailed account of the affected environment for each resource, current resource conditions, and anticipated effects of implementing the alternatives. Chapter 4 provides a list of preparers for the EA, as well as a summary of agencies, individuals, and organizations that were contacted while conducting public outreach. Supporting documents, including resource specialists' reports containing details of the existing condition and resource effects, are included in the project record.

Background

The Wagoner Allotment is located in the southwestern corner of the Bradshaw Ranger District of the Prescott National Forest (PNF) and represents the project area for this environmental analysis, an area of approximately 30,600 acres. It is located approximately 15 miles southeast of Kirkland Junction, Arizona.

The topography of the allotment varies from relatively flat around Cellar Basin to steep mountain slopes in the southern Bradshaw Range and the McAllister Range. Most of the allotment has hilly terrain that is divided by drainages running through moderate to steep divides or canyons. Elevation on the allotment varies from about 3,450 feet at points where Blind Indian Creek and Minnehaha Creek leave the allotment along the west boundary to 7,000 feet at the crest of Horse Mountain in the Bradshaw Range.

Precipitation patterns in this area are bi-modal with monsoon events occurring during the summer and a second period of precipitation occurring in the winter season. Average annual precipitation across the allotment varies with elevation and ranges from approximately 16 inches at the lower elevations to 30 inches at the upper elevations.

The main vegetation types on the Wagoner Allotment consist of semi-desert grassland and desert scrub mix, interior chaparral, and pinyon/juniper with chaparral. Perennial grasses commonly found on the allotment include sideoats grama, black grama, threeawn, curly

mesquite, sand dropseed, needle-and-thread, vine mesquite, and tobosa. Shrubs found in the semi-desert type include catclaw, mesquite, shrub oak, snakeweed, and prickly pear cactus. Interior chaparral vegetation consists of stands of shrub oak, manzanita, mountain mahogany, catclaw, deerbrush, and skunkbush. Shrub density is variable across this type, and perennial grasses are often found inter-mixed, especially on south-facing slopes. Pinyon-juniper with chaparral includes a tree overstory with Utah and/or alligator juniper and pinyon pine, with shrubs in the understory. Riparian areas are found along several major streamcourses including Blind Indian Creek, Cellar Springs Creek, Minnehaha Creek, and Cherry Creek. Fremont cottonwood, willow, and ash are the most common obligate riparian woody species. Herbaceous riparian vegetation is variable in both density and species abundance, but includes sedges, rushes, bulrushes, and deergrass.

Indian Springs, in the north central portion of the allotment, has been developed as a water source for adjoining pastures. Over the years, gully incision has occurred resulting in partial dewatering of some of the former wetland area near the springs. In the western portion of the Knight Pasture, there is an active gully system with several headcuts that is showing signs of expansion. Although not a part of the grazing permit reissuance, the District Ranger proposes to implement measures to restore wetland ecosystem functions at Indian Springs and to reduce the impacts of gully expansion in the Knight Pasture.

Noxious weed surveys have not been conducted specifically on this allotment; however, field visits have indicated that isolated patches of tamarisk occur along some creeks on the allotment. Treatment of noxious weeds is addressed in the *Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds, Coconino, Kaibab, and Prescott National Forests within Coconino, Gila, Mohave and Yavapai Counties, Arizona* and is managed under the PNF's noxious weeds program and will not be further addressed in this proposed action.

The Prescott National Forest designated a system of roads and trails that are open to motor vehicle use in 1989 through Forest Plan Amendment #4. Motor vehicle use off the designated road system by the permit holder to conduct activities associated with administration of the term grazing permit is allowed under the terms and conditions of the term grazing permit.

History of Use

The allotment has been managed for a total of 1,872 animal-unit-months (AUMs) of forage-use and is currently permitted for 156 head of cattle (cow/calf), yearlong. (An AUM is defined here as a measure of the average amount of forage used by one cow-calf pair over the course of one month.) This permitted level of use was implemented in the late 1970s. Prior to this, from the 1940s through the 1970s the permitted number of livestock ranged from 345 to 423 cattle yearlong.

There are four main pastures used in a rotational grazing system: Big, Horse, Paxton, and Cherry Units. Smaller pastures include the Bain, Knight, Rock Holding, and Campbell Flat Units that are used for limited time periods or for a small segment of the herd, such as bulls. Water sources are mainly developed springs or wells with pipelines and troughs, or surface flow water. There are several earthen stock tanks, but these have proven unreliable.

The Wagoner Allotment followed a rest rotation management system from 1983 through 2007. During even years, the Cherry Pasture was rested and during odd years the Horse Pasture was rested. Since 2007, a deferred rotation grazing system has been followed providing for growing season deferment. This growing season deferment splits livestock use during the growing season across four main pastures as opposed to using one pasture throughout the entire growing season. The period of use during this time frame was primarily 10 months, as cattle were moved to private land in April and May. There were four years (2007, 2008, 2010, & 2011) where livestock were removed from the allotment in early spring and did not return until mid-late fall in response to below average growing season precipitation.

Purpose of and Need for Action

The purpose of and need for this proposed action is to continue to authorize livestock grazing on the Wagoner Allotment in a manner consistent with the Prescott Forest Plan while meeting resource management objectives by applying adaptive management principles. Continuation of the livestock grazing authorization, under the described proposed action, is needed for the Wagoner 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).
- The Wagoner 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).
- 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 Wagoner 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.

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:

- range administration that provides for the maintenance of satisfactory Rangeland Management Status (RMS) with a static or upward apparent trend;

- 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 Desired Vegetative Status (DVS) 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, or show improvement in areas departing from satisfactory condition where livestock grazing is contributing to the departure;
- the maintenance of satisfactory conditions for water resources that meet 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 and banks and habitat for riparian-dependent plants and animals.
- protection and preservation of important historic and cultural sites; and
- the maintenance of suitable habitats for Management Indicator Species, Migratory Bird Treaty Act species, Forest Service 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 following exception(s): 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:

- 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)
- 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 one-quarter 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 one-quarter 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)
- 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)
- Unsatisfactory condition rangelands will be treated through implementation of approved allotment management plans. Treatments will include structural or nonstructural range improvements necessary to implement or maintain prescribed intensity levels; or adjusting stocking levels as necessary to maintain prescribed intensity levels (p. 59 and 65 for MA 3 and MA 5, respectively)
- 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)
- Manage range resources at Level E in Management Area 3 (chaparral, desert scrub and grassland) 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)
- Manage range resources at Level E (described above) in the grass and desert scrub vegetation type in Management Area 5 (p. 64)

Soils, Watershed and Riparian Areas:

- Protect and improve the soil resource. (pg. 13)

- 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:
 - The ability of livestock to achieve these objectives has been substantiated by verifiable monitoring and/or independent research;
 - Use of livestock is the most cost-effective means of achieving these objectives; and
 - 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)
 - 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)
 - Manage the ground surface layer to maintain satisfactory soil conditions (*i.e.*, to minimize soil compaction) and to maintain hydrologic and nutrient cycles. (pg. 145)

Wildlife, Rare Plant, Fish & Aquatic Species Management:

- Manage for a diverse, well distributed pattern of habitats for wildlife populations and fish species. (pg. 13)
- All water developments will consider small game and nongame needs and escape devices. (pg. 27)
- All new or reconstructed 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 October 2011 at <http://www.fs.fed.us/sopa/>. A letter dated 4/20/2012 describing the proposed action for management of this allotment was sent to the permit holder and ranch manager of the allotment, 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 provide feedback 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 brought forth from scoping 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 and three emails were received in response to the scoping period for this project which began on April 20, 2012. Two emails from Arizona Game and Fish Department advocated the use of wildlife-friendly designs for fencing. They were in support of the proposed water developments to provide water for wildlife and enhance habitat. One email was an inquiry from one of the tribes for more information, which was provided by Forest archeologists. A letter was received from the U.S. Fish and Wildlife Service that advocated incorporating seasonal rest for riparian areas (part of project design), and recommending that our analysis consider effects to the desert tortoise (contained in Wildlife, Fish and Rare Plant Specialist Report). One letter raised concerns about the condition of riparian areas and protection measures that will be incorporated into the proposed action. The Hydrology and Water Resources Specialist Report addresses these concerns in detail. The third letter provided suggestions on what the grazing analysis should address, and mentioned including range capacity, soil productivity, riparian resources, wildlife, and invasive species. The letter also raised concerns about stocking levels in response to possible future drought conditions (project design addresses through adaptive management), and concerns over the use of chapter 90 of the Forest Service Handbook 2209.13 (outside the scope of this analysis). The Deciding Official reviewed the comments from scoping and determined whether issues were raised that would lead to the development of other project alternatives.

No responses received during the scoping period raised concerns that will not be addressed through project design of the proposed action including resource protection measures and incorporating Best Management Practices, and following the standards and guidelines of the Prescott Forest Plan.

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, Yavapai Prescott Tribes, 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 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 Wagoner Allotment; if so, under what conditions; and whether new improvements including water developments and fencing 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. The decision to implement the gully stabilization activities described in Alternative 1 can occur independently of the decision whether or not to continue livestock grazing on the allotment.

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 make progress towards project objectives. 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 continues to comply with laws, regulations, and the Forest Plan. Reviews of existing project-level decisions are made periodically 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.

CHAPTER 2 – Proposed Action and No Action Alternatives

This chapter describes the proposed action and no action alternatives considered for the management of the Wagoner 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 detailed map of the allotment showing pastures and proposed improvements is provided in Appendix 1.

Departure between Existing and Desired Resource Conditions

A comparison of existing resource conditions with desired conditions 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. This project will only address changes that can be brought about by changes in livestock management. For example, it may be desirable to have fewer juniper trees on a woodland site, but this cannot be accomplished with livestock management. The desired condition for vegetation is to achieve (or move towards) mid to high similarity with the potential natural plant community as described in the Ecological Classification of the Prescott National Forest (draft 2005). Six pastures on the allotment were surveyed by the Interdisciplinary Team (ID Team), and five representative Terrestrial Ecological Unit Inventory (TEUI) map units were chosen in areas that are accessible to cattle and are representative of the forage base of the allotment. Inventory of the vegetation and soil was conducted to determine if desired resource conditions were being met. Vegetation was found to be meeting desired condition over about 84% of the allotment, based on key map unit sampling and visual assessment of unsampled areas by the ID Team. Areas needing improvement in perennial grass cover and/or species composition to achieve mid to high similarity with the site potential include TEUI 370 in the Bain Pasture (495 acres); TEUI 363 in the Big, Knight, and South Paxton Pastures (approx. 1400 acres), and TEUI 360 in the southwest Paxton Pasture (approx. 2890 acres). Long-term monitoring sites located in TEUI 363 show that perennial grass abundance has improved since the 1970's by implementing improved management such as stocking levels in balance with forage capacity. This trajectory of improvement is expected to continue under the proposed action.

Soils were determined to be in unsatisfactory condition at TEUI 363 in the Cellar Basin portion of the Big and Horse Pastures (1428 acres), and within the Knight Pasture and the south Paxton Pasture (approx. 900 acres). Soil condition was assessed as impaired at TEUI 370 in the Bain Pasture (495 acres) and TEUI 360 in the Horse and southwest Paxton Pastures (5574 acres). Improved management that allows for retention of biomass on site will improve water infiltration and nutrient cycling functions of the soil. Improvement in litter and vegetation cover and its spatial distribution will protect soil from accelerated erosion. Improvements in the functional capability of the soil will mean progress towards improvement in soil condition, although changes in soil function can be quite variable and actual changes in soil condition class could take up to 100 years on some soils that are currently in unsatisfactory condition.

Resource Management Objectives:

Resource management objectives are concise statements of measurable, time-specific outcomes intended to move toward achieving desired conditions. Management objectives are the means of measuring progress toward achieving or maintaining desired conditions. 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. The following management objectives were developed to measure progress towards meeting desired conditions:

Vegetation:

- Improve or maintain cover of perennial grasses to achieve mid- to high similarity with the potential perennial grass canopy cover and composition as shown in the Ecological Classification for the Prescott National Forest for key TEUI map units; achieve an upward trend in vegetation condition towards this objective.

Soil:

- Attain or maintain vegetative groundcover levels (litter and vegetation cover) similar to the TEUI potential and improve its spatial distribution as a means to alleviate soil compaction and improve soil structure.

Where desired resource conditions are not being met, site-specific resource protection measures 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:

Improvement towards desired condition for vegetation and soil is expected to be measurable within the 10-year timeframe indicative of the term grazing permit. Improvement will depend on adequate precipitation within normal ranges. Prolonged drought would cause conditions to deteriorate even in the absence of grazing. Annual monitoring of the implementation of the grazing plan will occur as well as monitoring of short-term rangeland health indicators. This annual and short-term monitoring will be used to inform managers to make needed annual adjustments in livestock management in order to make progress towards meeting desired conditions. Stocking would be commensurate with forage production, and would be greatly reduced, or non-use taken, in extreme drought.

There are locations where historic impacts have led to current conditions that are in a stable state and may not improve considerably within the timeframe of the 10-year grazing permit. TEUI 370 in the Bain Pasture has shrub cover that is twice as high as the potential plant community shrub cover. Establishment of perennial grasses will be limited by the shrub cover, and mid-similarity may not be achievable unless shrub cover is physically removed. Without improvement in the spatial extent of herbaceous vegetation, improvement in soil condition will also be limited. Vegetation and soil condition in flat, valley plain portions of Cellar Basin (TEUI 363) are expected to remain in unsatisfactory condition although some improvement in groundcover may be achieved over a 10-year period. This map unit has passed an ecological threshold due to sustained historical disturbance creating a disclimax ecological potential that differs from natural conditions. Benchmark areas to monitor changes in condition as a result of grazing management will be chosen in areas that are most capable of exhibiting change. For example, a location characterized as a closed-canopy juniper woodland with little perennial grass in the understory is unlikely to exhibit changes in the amount of perennial grass present in response to grazing management alone, so long-term monitoring areas should not be located there.

Alternatives Studied in Detail

Alternative 1 – Proposed Action

The following Proposed Action has been developed to meet the project's purpose and need for action. The Proposed Action consists of six components: Authorization, Adaptive Management, Resource Protection Measures, Structural Range Improvements, Gully Stabilization, and Monitoring. The Proposed Action follows current guidance from Forest Service Handbook 2209.13, Chapter 90 (Grazing Permit Administration; Rangeland Management Decision-making).

Authorization

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

- ✚ A term grazing permit will be issued providing for livestock use not to exceed 1,872 Animal Unit Months (AUMs) yearlong. (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 allow for grazing by up to 156 head of adult cattle, or cow/calf pairs and bulls, on a yearlong basis or a higher number of livestock when calculated on a less than yearlong basis.
- ✚ Livestock will be managed using a rotational grazing system incorporating growing season rest or deferment to promote forage plant recovery following grazing. Grazing deferment allows for pastures to be rested for all or a portion of a growing season by not using the pasture for the same period from year to year.

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.

Adaptive Management

The Proposed Action includes the application of adaptive management principles. Adaptive management is designed to provide sufficient flexibility to allow 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 described below.

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. Annual Operating Instructions and the Allotment Management Plan 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/or 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.

Resource Protection Measures

The proposed action is designed to comply with Forest Plan standards and guidelines, as amended. Resource protection measures will be incorporated into the project as design features to protect forest resources such as soil, water, vegetation, and riparian habitats; as well as to maintain or make progress toward desired conditions. Best Management Practices will be implemented to comply with the Clean Water Act.

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. Grazing intensity is measured by determining the level of utilization on forage plants. Utilization is the proportion or degree of the current year's forage production that is consumed or destroyed by animals (Interagency Technical Reference 1999). Allowable utilization levels are guidelines to be achieved as an average over the long term to maintain or improve rangeland vegetation and long-term soil productivity. Relative utilization may be measured before and during the growing season and can be utilized as a tool to manage livestock so that expectations of end of growing season utilization measurements can be achieved.

Holechek and Galt (2000¹, 2004²) 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. In addition to using utilization levels as a tool to manage livestock grazing impacts, the critical stubble height necessary for key forage species to maintain plant health and watershed values will also be considered. Allowable utilization guidelines will be applied across the allotment to provide rangeland managers with information needed to adapt management through adjustments. Utilization data can be used: (1) to identify use patterns, (2) to help establish cause-and-effect interpretations of range trend data, and (3) to aid in adjusting stocking rates when combined with other monitoring data (Interagency Technical Reference 1999). 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 Holechek, J.L. and D. Galt. 2000. Grazing Intensity Guidelines. *Rangelands* 22 (3):11-14.

² Holechek, J. and D. Galt. 2004. More on Stubble Height Guidelines. *Rangelands* 26 (4):3-7.

1. A management guideline of 35-45% forage utilization of key forage plants in upland key areas as measured at the end of the growing season.
2. Up to 50-60% browse use on key upland woody species;
3. Minimum stubble height on key riparian herbaceous species - four to six inches where sedges and rushes are key species, eight inches where deergrass is key species.
4. Up to 20% use by weight on key woody species within riparian areas; or less than 50% of terminal leaders browsed on woody vegetation less than 6 feet tall.

Site-specific Measures: Through the allotment analysis process undertaken by the ID Team, some areas have been identified where the current condition of perennial herbaceous vegetation or soils are in less than the desired condition. Some current resource conditions may be a result of historic grazing impacts. For instance, Cellar Basin in the upper portion of the allotment and the Knight Pasture adjoining private land in the southwest part of the allotment were traditional livestock concentration areas due to flat terrain and reliable water sources. The allotment was grazed by over 500 head of cattle in the 1930s. Permit reductions through the years have sought to balance permitted grazing with forage capacity, with the most recent reduction occurring in the late 1970s when the permitted number went from 345 cattle yearlong (CYL) to the current level of 156 CYL. Improvement in perennial grass composition and cover has been realized from the 1970s to present as a result of improved management. Given that this is an arid environment with inherently low vegetative production, changes can take decades to occur, even with improved management. Improvement in soil function in areas that are not currently in satisfactory condition may take decades or centuries to fully restore soil functions unless intensive restoration projects are implemented.

Riparian areas recover from disturbances and past conditions much more rapidly because of the greater availability of soil and subsurface water. However, they are subject to periodic disturbances from scouring floods, following which a process of regeneration occurs. For example, established woody riparian vegetation was removed from reaches of Blind Indian Creek by floods in 1993 and subsequent germination of cottonwoods has led to areas of pole size trees with current canopy coverage at or near site potential.

The following upland areas have been identified as needing improvement in order to meet desired resource conditions. Management objectives are listed that will measure progress towards achieving desired resource conditions. The key soil map unit is identified where long term monitoring of representative areas will be used to determine management effectiveness. The soil map units are listed as Terrestrial Ecological Unit Inventory (TEUI) numbers as mapped in the Terrestrial Ecosystem Survey of the Prescott National Forest. Grazing utilization will be reduced in these areas to allow more residual vegetation to protect the soil surface from erosion, aid in water infiltration, and enhance nutrient cycling capacity.

Upland Key Sites:

Bain Pasture, key soil map unit TEUI 370:

Management Objectives: Improve or maintain cover of perennial grasses to achieve mid-to high similarity with the potential grass canopy cover (28%); achieve an upward trend in vegetation condition towards this objective; maintain effective groundcover levels similar to potential (15% litter and 15% basal vegetation) and improve its spatial distribution as a means to alleviate accelerated soil loss and improve nutrient cycling.

Grazing Intensity: A management guideline of up to 30% forage utilization of key forage plants in upland key areas as measured at the end of the growing season.

Cellar Basin, Big Pasture and Horse Pasture, key soil map unit TEUI 363:

Management Objectives: Improve or maintain cover of perennial grasses to achieve mid- to high similarity with the potential grass canopy cover (13%); achieve an upward trend in vegetation condition towards this objective; attain/maintain effective groundcover levels similar to potential (10% litter and 5% basal vegetation) and improve its spatial distribution as a means to alleviate soil compaction and improve soil structure.

Grazing Intensity: A management guideline of up to 30% forage utilization of key forage plants in upland key areas as measured at the end of the growing season.

Knight & South Paxton Pastures, key soil map unit TEUI 363:

Management Objectives: Improve or maintain cover of perennial grasses to achieve mid- to high similarity with the potential grass canopy cover (13%); achieve an upward trend in vegetation condition towards this objective; attain/maintain effective groundcover levels similar to potential (10% litter and 5% basal vegetation) and improve its spatial distribution as a means to alleviate soil compaction, improve soil structure, and promote soil stability.

Grazing Intensity: A management guideline of up to 30% forage utilization of key forage plants in upland key areas as measured at the end of the growing season.

Southwestern Paxton Unit, key soil map unit TEUI 360:

Management Objectives: Improve or maintain cover of perennial grasses to achieve mid- to high similarity with the potential grass canopy cover (24%); achieve an upward trend in vegetation condition towards this objective; attain/maintain effective groundcover levels similar to potential (12% litter and 14% basal vegetation) and improve its spatial distribution as a means to alleviate accelerated soil loss and improve nutrient cycling.

Grazing Intensity: A management guideline of up to 30% forage utilization of key forage plants in upland key areas as measured at the end of the growing season.

Riparian Area Management:

Bain Pasture, Blind Indian Creek:

Management Objectives: For the intermittent flow reaches assessed as Functional-At Risk move at least 50 percent to Proper Functioning Condition (PFC) within 10 years. Maintain and/or achieve and maintain canopy cover of obligate woody species to near potential (45% TEUI 30.1)

Grazing Management: Manage timing, intensity, and duration of use to allow obligate and key facultative herbaceous vegetation to become established along the greenline of intermittent reaches and maintain those reaches already established. Apply the allotment wide stubble height guidelines. Manage use to allow periodically germinated obligate woody species to move from seedling to sapling stage within regime of water availability.

Big Pasture, Blind Indian Creek:

Management Objectives: In the portions with strong intermittent flow, e.g., Ross Spring to Berry Spring reach, obtain key obligate and facultative herbaceous vegetation along the greenline where not rock armored or bank fully protected with roots of woody vegetation and maintain existing herbaceous vegetation.

Grazing management: Manage timing, intensity and duration of use to maintain existing and promote additional obligate and key facultative herbaceous vegetation along the greenline to become established. Apply the allotment wide stubble height guidelines.

Paxton Pasture, Minnehaha Creek:

Management Objectives: In the portions with long season intermittent flow within TEUI 41 (e.g., below Minnehaha Spring) obtain key obligate and facultative herbaceous vegetation along the greenline where not rock armored or bank fully protected with roots of woody vegetation and maintain existing herbaceous vegetation. Maintain and/or achieve and maintain obligate woody vegetative canopy in the near floodplain at or near its potential (65% TEUI 41).

Grazing Management: Manage timing, intensity and duration of use to maintain existing and promote additional obligate and key facultative herbaceous vegetation along the greenline to become established. Apply the allotment wide stubble height guidelines.

Paxton Pasture, Cherry Creek:

Management Objectives: Take advantage of opportunities to increase riparian woody vegetation along stream edge. Move toward obligate canopy cover potential of 45% (TEUI 30.1).

Grazing Management: Manage use to allow periodically germinated obligate woody species to move from seedling to sapling stage within regime of water availability.

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.

Structural Range Improvements

Construction of New Range Improvements: The proposed action includes construction of the following new structural improvements that have been developed to address resource concerns and are intended to aid in the achievement or maintenance of desired resource conditions by improving livestock distribution. Upland water developments will provide livestock water away from riparian areas and allow for achievement of riparian management objectives. Monitoring may indicate that some of these improvements are not necessary; however, if some or all of these improvements are not implemented, the upper limit of permitted livestock numbers may not be achievable on a sustained basis. Different types of water developments may be employed depending on the location, and could include a catchment apron and storage tank ("trick tank") with pipeline to water troughs, or pipelines to water troughs from existing spring developments or wells. The location of proposed range improvements are shown on the map in Appendix 1. There are 7 new water developments planned, and the development of a spring and additional pipeline added to an existing well development. The new developments will occur in the following pastures, with one development often providing water to more than one pasture.

1. Big Pasture: Construction of a water development north of Ross Spring; development of Purebred Spring.
2. Horse Pasture: Construction of two new water developments: one north and one south of Steamboat Spring; placement of two troughs from pipelines in southwest pasture; construction of drift fence to divide pasture.
3. Cherry Pasture: Construction of three water developments, one is shared with Paxton and Horse Pastures.
4. Paxton Pasture: Construction of three water developments: one shared with Knight Pasture, one shared with Cherry and Horse Pastures, and one on the McCallister Range.

5. Knight Pasture: Construction of one water development (shared with Paxton Pasture) and fence along forest boundary

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 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 will be included in the Annual Operating Instructions, 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.

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.

Gully Stabilization

Proposed gully stabilization would occur at Indian Springs and in the Knight Pasture. Practices would be designed to minimize further gully expansion, alleviate further dewatering of the soils profile, and promote soil stabilization as a means to decrease sedimentation. The following soil conservation practices may be implemented for gully stabilization.

- 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 erosion control structures, check dams, revetments, and or water spreaders using materials such as gabions, rocks/boulders, wattles, silt fence, wire mesh fence material, erosion blanket, concrete, rebar, etc.
- Incidental trees, shrubs, or other vegetation may be removed in order to accomplish the preceding stabilization activities.

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, grazing intensity).

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,

plant 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.

Effectiveness Monitoring: Long-term monitoring, according to a monitoring plan to be established in the Allotment Management Plan, to evaluate the success of management in achieving desired resource conditions will occur within key areas or on permanent transects at an interval of 10 years or less. Data collected on this allotment during the current management revision process will serve as baseline information used by managers to determine the effectiveness of future management in meeting desired resource conditions. 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, 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 Wagoner 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. The District Ranger may choose to authorize the gully stabilization activities that are described in Alternative 1 while not authorizing the continuation of livestock grazing that is part of that alternative.

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.

Comparison of Alternatives and Effects for Wagoner Allotment

Wagoner Allotment	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
Authorization (AUMs, Season of Use & Term)	Livestock use not to exceed 1,872 Animal Unit Months (AUMs) yearlong. As an example, this would allow for grazing by up to 156 head of adult cattle, or cow/calf pairs and bulls, on a yearlong basis or a higher number of livestock when calculated on a less than yearlong basis.	N/A
Grazing Intensity	In areas of satisfactory condition, a management guideline of 35-45% forage utilization of key forage plants in upland key areas as measured at the end of the growing season, and up to 50-60% browse use on key upland woody species; In areas needing improvement, limit utilization to less than 30%.	N/A
New Improvements	Construct Forest boundary fence in Knight Pasture and drift fence in Horse Pasture; develop Purebred Spring; add pipeline to existing well; develop 7 new waters (several are shared across pasture boundaries); gully stabilization in Knight Pasture	No new range infrastructure implemented, but gully stabilization activities in the Knight Pasture and at Indian Spring may be authorized with this alternative.

Wagoner Allotment	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
	and at Indian Spring.	
Maintenance of Improvements	Existing improvements listed on the term grazing permit are maintained to standards by grazing permittee.	Maintenance of range improvements discontinued except for maintaining forest boundary fences. Without a permittee, maintenance responsibility will default to the Forest Service.
Monitoring	Monitoring of implementation and effectiveness of adaptive management during term of permit	Monitoring of livestock use and effects discontinued
Vegetation Effects	Management flexibility with adaptive management related to the timing, intensity, and frequency of grazing and variable stocking level is responsive to plant physiological needs. Improvement in plant vigor, cover, and composition realized over time in traditional livestock concentration areas such as Cellar Basin as new water developments improve livestock distribution. Retention of 55-70% or more of biomass on site to aid in water infiltration and nutrient cycling, which will improve plant growth and vigor. Improvement in vegetation condition is dependent on adequate rainfall over the long-term. Herbaceous vegetation in TEUI 370 may show little measureable improvement due to extensive shrub cover.	Livestock use discontinued. Improvement in herbaceous vegetation cover and species composition would occur, but it will be dependent on adequate precipitation and the degree of shrub and tree cover. Those areas with extensive tree or shrub cover are likely stable and would show little difference from alternative 1. Improvement in herbaceous vegetation in open areas may occur at a slightly faster rate than under alternative 1 since more biomass is retained on site. Herbaceous vegetation in TEUI 370 may show little measureable improvement due to extensive shrub cover.

Wagoner Allotment	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
Watershed/Soil Effects	<p>Soils in less than satisfactory condition would improve within their ecological capability through the application of resource protection measures designed to improve vegetation conditions. Implementation of light use levels in areas needing improvement allows for 70% or more of biomass to be retained on site. Retention of biomass would allow organic matter to be incorporated into the soil for nutrient cycling and ground cover for protection of the soil from accelerated soil loss.</p>	<p>Soils in less than satisfactory condition would improve within their ecological capability. More biomass is retained on site than alternative 1. Retention of biomass would allow organic matter to be incorporated into the soil for nutrient cycling and ground cover for protection of the soil from accelerated soil loss. Improvement may occur at a slightly faster rate than alternative 1.</p>
Wildlife/Rare 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. Upland areas will improve towards desired conditions by implementing use guidelines. Some impacts on Management Indicator Species (MIS) habitat, but no effect to trend of MIS species forest-wide. Eleven Regional Forester sensitive species may occur or have habitat in the project area. Project actions may impact individuals or habitat for five of these species, but there would not be a trend toward Federal listing. Six of the eleven species would have no impact from project actions. Some impacts to priority species of migratory birds but would not have a measurable negative effect to their populations. No impacts to Important Bird Areas or Overwintering Areas.</p>	<p>May provide more rapid movement toward desired habitat conditions in upland areas affected by livestock grazing. Any potential impacts to Forest Service sensitive species, Management Indicator Species and migratory birds from the presence of livestock will no longer occur.</p>

Wagoner Allotment	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
Archeological Effects	No adverse effects on heritage resources. Avoidance of impacts to cultural resources during construction of new range improvements and gully stabilization activities.	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, through application of grazing management, Forest Plan goals for resource management met over time. Consistent with policy to manage forage-producing federal lands for livestock grazing.	Yes, achieves Forest Plan resource management goals. Not consistent with direction to manage forage-producing lands for livestock grazing.

CHAPTER 3 – Existing Condition & Environmental Effects

A summary of the existing resource conditions and environmental effects of management alternatives is provided in this chapter. Each resource specialist has considered the direct and indirect effects that would be expected to occur from implementation 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 details of these considerations.

The following table summarizes the past, present, and future activities within the four primary 6th level watersheds that contain portions of the allotment: Blind Indian Creek, Minnehaha Creek, Cherry Creek, and Oak Creek. For certain resources, the cumulative effects area of consideration is the allotment boundary. The map in Appendix 5 defines the 6th level watersheds in relation to the project area.

Past, Present, and Future Activities Table Wagoner Allotment – Blind Indian Creek, Minnehaha Creek, Cherry Creek, and Oak Creek 6th Code Watersheds

Type of Activity	Past Activities/Events	Present Activities	Future Activities
Wildfire Suppression	1970s and 1980s: 5694 ac. 1990s – 2000s: 0 ac.	Gladiator Fire – 2959 acres	unknown
Timber/Fuelwood Sales	None	None	None planned
Veg Treatment Projects / Non-Structural Range Improvements / Rx Burns	RX Burn, 1994-2003: 4476 ac.	Rx Burn, 2011: 2197 ac.	None planned
Livestock Grazing	Past allotment management of allotments on NFS lands; livestock grazing on other land ownerships.	Contains portions of 6 grazed allotments and one closed allotment; Stocking levels reflect forage and range conditions w/associated structural improvements	No anticipated change

Type of Activity	Past Activities/Events	Present Activities	Future Activities
Water Supply Improvements	Numerous water developments constructed on 6 active grazing allotments; water for livestock and mining uses since late 1800s	Continue maintenance of water developments on active grazing permits	Construct 7 new water developments; develop spring and add pipeline to existing well
Recreational Activities & Fuelwood Cutting	Motorized and non-motorized trails; Dispersed recreation (primarily hunting)	Same activities; 30.5 miles of existing designated trails – mainly motorized	No anticipated change; no new trails planned
Roads, Utility ROWs, Land Development and Land Exchanges	62 miles of roads on National Forest Land; no utility corridors	62 miles of roads on National Forest Land; no utilities or ROWs	No new roads or facilities planned; no land exchanges anticipated
Mining	Locatable and non-locatable claims; gold and copper mining; 8 mines listed as past producers	Locatable and non-locatable claims; 16 pending claims, 13 in unknown status	Continuation of current active claims

Rangeland Vegetation

Existing Condition:

The Terrestrial Ecosystem Survey of the Prescott National Forest and its associated Ecological Classification is used in describing the vegetative condition on the Wagoner Allotment. Process and methodology are described in "Field Process for Assessing Rangeland Conditions as Part of Rangeland NEPA Analysis on the Prescott National Forest". The R3 Rangeland Analysis and Management Training Guide provides guidance in the use of Desired Vegetation Status (DVS) to determine Rangeland Management Status (RMS); RMS is the allotment management's success in meeting resource objectives. For this project, the DVS was determined to be the Potential Natural Community (PNC) for individual TEUI map units. In some cases, species composition of perennial grasses was not similar to those species shown for the ecological type for the TEUI, but if the species that were present were desirable forage species, then it was determined to be meeting the DVS.

TEUI Map Units Analyzed

TEUI Map Units	Total Acres	Percent of Allotment	Pastures Sampled
360	11,645	38%	Cherry, Horse, Paxton, Paxton SW
363	3,128	10%	Big, Horse, south Paxton, Knight
370	495	2%	Bain
475	8,514	28%	Cherry, Horse
481	723	2%	Big
Total Percent of Allotment Analyzed		80%	

TEUI 360 is a hot steppe desert shrubland with vegetation varying by slope aspect from shrub-dominated on north-facing slopes to grass-dominated on south-facing slopes. TEUI 360 is one of the larger units on the Wagoner Allotment and covers approximately 38% of the allotment. It is found within all pastures with exception of the Rock Holding Pasture and the Knight Pasture. There is a broad range in elevation for this map unit from 2950 to 4760 feet. On north-facing slopes, the potential natural plant community (PNC) would be expected to have 15% grass cover. Dominant grass species include black grama and sideoats grama. The tree component would be absent and the shrub component would exhibit about 53% cover from shrubs, with the dominant species being shrub live oak, mountain mahogany, and deer brush. On south-facing slopes, PNC would be expected to have 17% shrub cover with the dominant shrub being cat claw and 24% canopy cover of perennial grasses. The dominant grass species include sideoats grama and black grama.

Rangeland Management Status is satisfactory for TEUI 360 in the Cherry, Horse, and northern part of the Paxton Pastures. In the north Paxton Pasture, the grass species composition showed a high level of needle-and-thread grass (*Stipa* species), which is not part of the ecological type composition, but it is a desirable cool-season grass species, so the DVS is to maintain this species. The southwest part of the Paxton Pasture in the vicinity of Campbell Flat exhibited unsatisfactory RMS because perennial grass canopy cover shows low similarity to the site potential. Observations noted that this area is a much drier site and there was some mortality observed on black grama. Perennial grass canopy cover was estimated to be only 1-2% with species that included black grama, curly mesquite, sideoats grama, three-awn, and bottle brush squirreltail. The desired condition for this portion of the map unit is to maintain the current perennial grass canopy cover and improve the canopy cover to the extent possible.

TEUI 363 is a hot steppe desert shrubland occurring on elevated and lowland plains in the Cellar Basin and Campbell Flat locations on the Wagoner Allotment. TEUI 363 covers approximately 3100 acres or roughly 10% of the allotment. Elevations range from 3530-4180 feet. PNC includes a low (3%) tree cover consisting primarily of velvet mesquite, 25% shrub cover with wait-a-minute bush, shrub live oak, shrubby buckwheat, and velvet mesquite comprising the dominant species, and a low (13%) perennial grass canopy cover consisting primarily of curly mesquite.

TEUI Map Unit 363 is variable in regard to topography; where the topography is more broken by inclines and rock inclusion, there is an observed increase in shrub and perennial grass diversity and canopy cover on north and east facing aspects. On the flatter lowland plains, diversity and canopy cover for both shrubs and perennial grasses is noticeably lower which was observed in the field plots analyzed. Field measurements and observations from the 4 pastures evaluated for this map unit showed variable shrub cover from 7 to 43%, and perennial grass cover from 2 to 7%. Annual cool season forbs and grasses are widely distributed in flatter areas. Rangeland Management Status was considered satisfactory for TEUI 363 in the Horse and north Paxton Pastures, and unsatisfactory in the Big, Paxton south, and Knight Pastures. Perennial grass composition and canopy cover showed low similarity to the site potential in these pastures, mainly in the flat, lowland plain portion of the map units in these pastures.

Trend data for this map unit dates back to 1963 when the first range analysis was completed on this allotment. There are long-term monitoring locations on this map unit in both the Big Pasture and the southwestern portion of the Paxton Pasture. In 1963 the condition score was poor and trend was downward at the Big Pasture location, and fair with a downward trend in Paxton Pasture. Another analysis was completed in 1975 and the condition score for both sites had

deteriorated to very poor with downward trend. The evaluation completed in 1975 noted that areas consistently used year after year were in a depleted condition and on a steep downward trend. Those areas included Cellar Basin, Blind Indian Creek, Campbell Flat, and Bain Spring west. It was noted that the rest-rotation grazing system had not been followed and the permitted numbers exceed the grazing capacity. As a result of that evaluation, permitted numbers were reduced from 345 to 156 cattle year long. When these two sites in TEUI 363 were again evaluated in 2007, vegetation condition scores had improved an average of 15 points (20 points represents a condition class) from 1975 levels, and relative abundance of perennial grasses had improved an average of 18%.

TEUI 370 is described as a hot steppe desert shrubland occurring on lowland plains located within the Bain Pasture. TEUI 370 covers approximately 500 acres or roughly 62% of the pasture but it is a relatively small unit comprising only 2% of the entire allotment. Elevations range from about 3850 to 4760 feet for this map unit. Vegetation composition is highly variable across this unit; dominant shrubby vegetation species include catclaw, wait-a-minute bush, shrubby buckwheat, and snakeweed. Dominant perennial grass species include sideoats grama, black grama, and curly mesquite. The PNC for TEUI 370 would be expected to have 28% total cover of perennial grasses including black grama, sideoats grama, curly mesquite, sand dropseed, and tobosa.

Field observations from a study plot taken in January, 2010, indicate canopy cover of shrubs are nearly twice that of the PNC and perennial grass canopy cover is lower than PNC. The increased shrub canopy may be in part contributing to the reduced understory perennial grass canopy cover. While species diversity was similar to PNC, perennial grass canopy cover was only 10% in the field plot. Observers also noted that palatable grass species were limited in occurrence to protected areas not accessible to livestock. Rangeland Management Status in TEUI 370 is unsatisfactory due to low similarity in perennial grass canopy cover to the potential canopy cover. Desired condition for this TEUI Map Unit would be to maintain the current perennial grass species diversity and canopy cover and to the extent possible, increase perennial grasses in the more open areas within this map unit. Benchmark monitoring locations for TEUI 370 to evaluate progress towards desired conditions should be located in areas with shrub canopy that is not exceeding potential, if possible.

TEUI 475 is a chaparral dominated vegetative community occurring on steep slopes. This vegetative community is found on the eastern half of the Horse Unit, almost the entire portion of the Cherry Pasture, and the southeastern portion of the Paxton Pasture. TEUI 475 covers approximately 8500 acres or 28% of the Wagoner Allotment. Elevations range from 4640-6470 feet. Dominant shrubby vegetation species include shrub live oak and mountain mahogany, with a PNC canopy cover of 60%. PNC for perennial grass canopy cover is low (5%) with the dominant species being sideoats grama.

This chaparral community dominates much of the north facing slopes across the Cherry and Horse Pastures. The location of the field plot analyzed for this TEUI is northwest of Thompson Butte. The sampling location is dominated by shrub live oak and to a lesser extent by mountain mahogany and ceanothus. Total shrub canopy cover is 31%, slightly over half of what one would expect at PNC. Total perennial grass canopy cover is 2% with sideoats grama being the dominant species. Other species observed include black grama, stipa, and three-awn. Current vegetation status is moderately similar to PNC, and Rangeland Management Status (RMS) is considered satisfactory for TEUI 475. The determination of satisfactory RMS is based primarily on the shrub component because this is the prominent forage base for this map unit.

TEUI 481 is a pinyon/juniper woodland occurring on elevated and valley plains in the northeastern portion of the Big Pasture. It covers approximately 722 acres (17%) of the pasture and is a relatively small vegetative community covering only 2% of the Wagoner Allotment. Tree species include pinyon pine and juniper species, with about 30% tree cover at PNC. Shrub species are dominated by shrub live oak, and would be about 18% at PNC. Canopy cover of perennial grasses is expected to be 14% at PNC with blue grama and sideoats grama being the dominant grasses.

Data from the field plot analyzed in January, 2010, indicate that woody species canopy cover is approximately half of what would be expected for juniper. Shrub canopy cover (20%) is near PNC and perennial grass canopy cover of 17% is higher than what would be expected at PNC. The dominant perennial grass species is black grama comprising almost $\frac{3}{4}$ of the total grass canopy cover. Other perennial grasses include sideoats grama, blue grama, curly mesquite, and three-awn. Black grama is not a primary indicator species for TEUI 481, but it is a desirable perennial grass species that will be maintained as part of the DVS for this map unit. Rangeland Management Status is satisfactory for TEUI 481 since there is high similarity to the DVS.

Direct & Indirect Effects on Vegetation:

The Wagoner Allotment Range and Upland Vegetation Specialist Report addresses the direct, indirect, and cumulative effects of each alternative. 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). A majority of the vegetation evaluated on the allotment (about 84%) was determined to be in satisfactory condition and meeting desired conditions, and with continued proper management this should be maintained. Five long-term monitoring sites all showed improvement in vegetation condition scores between 1975 and 2007 readings. The average level of improvement was nearly one condition class, and was due to an observed increase in abundance of desirable forage grasses. 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 growing season deferment or rest. Deferred rotation allows key forage species the opportunity to store carbohydrates and set seed during periods of seasonal rest. The proposed new water sources will aid in proper livestock distribution. More reliable upland water will also alleviate cattle watering from riparian areas.

Within TEUI 363 in the Big, south Paxton and Knight Pastures, and TEUI 360 in the southwest Paxton Pasture, the existing cover and composition of perennial grasses is not meeting desired conditions of mid- to high similarity to PNC for the perennial grass component. The perennial grass lifeform is most impacted by cattle grazing, so it is used as the surrogate measure for the success of grazing management on vegetation as a whole. Vegetation recovery may be slow or

limited due to historic impacts that have led to soil compaction and poor vegetative groundcover on flat valley plain portions of Cellar Basin (TEUI 363). Compacted soils are less able to absorb water for plant growth. Improvement will be more rapid in those areas of the map unit on slight slopes where compaction is less. In TEUI 360 at the southwest end of Paxton Pasture there is only 1-2% perennial grass cover and it appears to be a much drier site than other locations for this map unit. There is a large departure from the site potential of 24% grass cover; however, improvement in perennial grass cover is expected with adequate precipitation, although mid- to high similarity to site potential may not be achievable in 10 years. There will be 70% or more of biomass retained on site after grazing to protect the soil and enhance nutrients and water holding capacity for plant growth. Growing season deferment and rest will benefit perennial grasses, and new water developments will improve livestock distribution away from prior concentration areas.

TEUI 370 is also currently showing unsatisfactory RMS based on low-similarity of existing vegetation to the desired condition. This soil map unit showed 10% cover of perennial grasses, while the PNC for this site would have 28% cover. The shrub cover measured was twice that of the PNC level. The shrub-dominated state will persist unless removed by fire or vegetation treatments. Current conditions at TEUI 370 resemble the woody shrub-invaded state described in the ecological site description state and transition model for Major Land Resource Area (MLRA) 38.1 Clayloam Upland (NRCS Ecological Site Description). 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 may require herbicide or mechanical shrub control and seeding. 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 for arid sites such as TEUI 370 and parts of TEUI 360 in the southwest Paxton Pasture (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. TEUI 370 is only present in the Bain Pasture that is used for a limited time period in the winter months, receiving growing season rest each year. This should help to establish perennial grasses when precipitation is adequate. Improving plant vigor and observable reproduction (indicators of upward apparent trend) in the grasses that do exist would be a qualitative indicator of management success in TEUI 360, 363, and 370. Improvement towards meeting desired conditions is expected under this alternative.

The estimated grazing capacity on the Wagoner Allotment is based on several sources: actual use records compiled from 1984 to present (shown in Appendix 2); application of stocking calculations based upon Holechek (1988); production and utilization study conducted from 1974 through 1976. These sources indicate that the allotment would support a range of livestock numbers based on fluctuating conditions.

The actual use records for the allotment from 1984 through 2011 show a range of stocking levels from complete non-use to 1,914 Animal-Months (AMs), which is equivalent to 160 adult cattle yearlong. The average stocking level for this time period is 1,320 AMs, or 110 cattle yearlong. While stocked at these levels, the allotment has realized an improvement in perennial forage grass abundance and species composition, as shown by comparison of 1975 to 2007 range condition monitoring data.

Using the methods outlined in Holechek (1988), grazing capacity estimates were made on the allotment as a whole by calculating the total amount of forage production by TEUI map unit as

shown in the Terrestrial Ecosystem Survey of the Prescott NF (“FORG” value). Animal Units ³ ranged from 226 Animal Units (~ 2712 AUM) when 40% of the available forage estimate is allocated to livestock, to 138 Animal Units (1656 AUM) when a reduction in capacity is taken into account for slopes greater than 10%. The forage production values given in the TES survey are an overall average for TEUI units, and actual site specific production may vary considerably. Yearly fluctuations in forage production based on precipitation levels will be taken into account by adjusting yearly stocking through adaptive management.

The production and utilization study from 1974 to 1976 calculated a grazing capacity on the Wagoner Allotment of 1,872 AMs or 156 cattle yearlong. This study was conducted at a time when the allotment was considered to be in poor to very poor condition over about 18,000 acres, which constitutes 59% of the total allotment acreage and most of the area accessible to livestock. Since that time, range conditions have improved considerably. The improved abundance of perennial grasses and species composition from 1975 to 2007 equates to more available forage now than the study from 1974-1976.

The adaptive management approach to grazing management seeks to balance stocking levels with forage production on a yearly basis. This allows for stocking in response to changes in forage production that naturally occur as a result of fluctuations in precipitation levels and seasonality. The maximum level of stocking (156 cattle yearlong) that is proposed may not be achievable in all years, but the actual use records show that the allotment has carried this number of livestock at times in the recent past without adverse effects.

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 would be removed. Only incidental wildlife grazing would occur sporadically at light intensities. The removal of grazing may allow for slightly more rapid improvement in vegetation cover, vigor, and composition in TEUI map units 363, 360, and 370, but there are historic impacts to soils in the valley plains in Cellar Basin and Campbell Flat areas (Knight and southwest Paxton Pastures) that could restrict perennial grass cover improvement even in the absence of grazing. Where shrub cover is currently twice what would be expected at PNC in TEUI 370, there will likely be limited improvement in perennial grass cover unless the shrub canopy is removed by fire or vegetation treatments. This stable state of shrub dominance is expected to persist even in the absence of grazing. Those areas currently considered in satisfactory condition would remain as such under the no grazing alternative. More residual biomass would be retained under this alternative, which has been demonstrated to improve water infiltration and enhance nutrient cycling, thus promoting vigorous plant growth.

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

³ Animal Units and Animal Months used in these calculations are based upon the Society for Range Management (1974) definition: An animal unit is one mature (1000lb) cow. This animal would be expected to consume 2.6% of its body weight per day or 26 lbs. of forage on a dry-weight basis.

Alternative 1:

The Proposed Action calls for constructing seven new water developments, developing a spring, and adding pipeline and troughs to an existing well. There is also approximately 2 miles of new fence constructed in Horse and Knight Pastures. The construction of new water sources can result in the removal of vegetation in areas up to ¼-acre each. Water sources will draw livestock to use forage within proximity of the water source. Grazing impacts may be locally heavy within ¼-mile of a water source. Rest and rotation strategies for pastures will help forage plants to recover after use. The new water sources will provide for dispersion of the grazing herd away from the limited water sources currently present. Fence construction should not impact existing vegetation other than in a limited, small area along the fence corridor. Woody vegetation or shrubs may be thinned along the fenceline. Fencing will aid in controlling livestock distribution and alleviating concentrated use in some areas. Access to existing improvements that are listed in Appendix 3 for maintenance 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.

Gully stabilization activities at Indian Spring and in the Knight Pasture have the potential to remove or disturb vegetation as machinery is used to contour gullies. Best Management Practices will be used to prevent excessive impacts that may prevent revegetation of the gully sites. Reseeding of gully treatment areas will use native seed that is appropriate to the ecological site.

Alternative 2: No vegetation would be impacted by the construction of new range improvements. Gully stabilization activities could be selected as part of the No Grazing alternative, and effects would be the same as those listed under alternative 1.

Cumulative Effects on Range Vegetation Resources

The cumulative effects analysis area considered for effects on range/vegetation resources consists of the Wagoner Allotment project area. The past and present activities and events that have affected the vegetation include livestock and wildlife grazing, past wildfires, prescribed fire, mining, 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 dispersed 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. The effects of past wildfire or prescribed burning were not evident on the allotment itself. The Gladiator Fire of 2012 burned over 2,000 acres in the watershed, but did not impact the allotment. Mining activities have occurred in the past, and some areas of localized digging for mineral exploration are present. Current mining activities appear small in scale and vegetation disturbance is insignificant. This could change as new claims are developed. Where roads exist 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 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.

Soils

Existing Condition:

Terrestrial Ecosystem Survey (TES) map units were used as the basis to assess soil conditions. Field assessments of soil condition were conducted on the same TEUI map unit and in the same location as the assessments of vegetation condition. The Wagoner Grazing Project Soil Specialist Report discusses the direct and indirect effects of this project on the soil resource in greater detail.

Soil quality standards were analyzed using the USFS Southwest Region 3 Soil Condition Evaluation protocol (USDA FS 1999). The Prescott National Forest Terrestrial Ecosystem Survey (TES) was used as the basis for this analysis and is defined as the systematic analysis, description, classification (soil/vegetation), mapping and interpretation of terrestrial ecosystems (Robertson 2000). TES was used to determine if the soil resources were functioning within their ecological capability.

Soil condition is an evaluation of soil quality or the capacity of the soil to function within ecosystem boundaries to sustain biologic productivity, maintain environmental quality, and promote plant and animal health (USDA FS 1999). The soil condition rating procedure evaluates soil quality based on an interpretation of factors that affect three primary soil functions. The primary soil functions evaluated are soil stability, soil hydrology, and nutrient cycling (USDA FS 1999). These functions are interrelated.

Field evaluation shows that TEUI 360 is in satisfactory soil condition in the Cherry Unit (572 acres). A recent decrease of graminoid cover has resulted in areas experiencing soil instability due to the moderately steep gradients. However, vegetative ground cover (VGC) is greater than potential, with a lower level of basal cover. VGC is well distributed across the landscape but the lower levels of graminoid cover and basal cover has resulted in patches of increased runoff and overland flow. TEUI 360 in the Horse Pasture (2684 acres) was evaluated as being in impaired soil condition due to low levels of organic matter as indicated by VGC levels and their spatial distribution and elevated soil loss in the form of sheet and rill erosion. VGC levels are below potential and not well distributed across the landscape primarily due to lower graminoid cover. Erosion rates are elevated but high rock cover is armoring the site. TEUI 360 in the northern portion of the Paxton Pasture (4280 acres) exhibits satisfactory soil condition. High levels of graminoid cover are producing high amounts of organic matter that is being incorporated within the soil through nutrient cycling. Soil structure is favorable and soils are stable. TEUI 360 in the southern portion of the Paxton Pasture near Campbell Flat (about 2890 acres) was assessed to be in impaired soil condition due to lack of organic matter across the landscape and accelerated soil loss. The lack of organic matter has contributed to a reduction in infiltration, increased run off, and resultant lack of nutrient cycling.

TEUI 363 was assessed in unsatisfactory soil condition in the Big, Horse, Knight, and south Paxton Pastures. This TEUI map unit represents about 10% of the allotment. This map unit has passed an ecological threshold due to sustained historical disturbance creating a disclimax ecological potential that differs from natural conditions (Robertson 2000). Soil structure is poor with minimal soil organic matter due to severe compaction. Measured infiltration rates have decreased significantly. Vegetative ground cover is poorly distributed across the landscape with minimal graminoid cover resulting in elevated soil movement. However, VGC levels are similar to the disclimax potentials described in TES. In the Knight Pasture, accelerated erosion in the form of continuous active gullying and sheet erosion is occurring. Lateral instability of the gullies is occurring with sloughing but vertical cutting has stabilized as indicated by the establishment of perennial graminoid and shrub species at the base of the gully system. Other portions of the Knight Pasture associated with gently sloping gradients have higher levels of evergreen shrub and graminoid cover, and are providing localized stable conditions. However, these areas are intermixed with a labyrinth of gully systems.

TEUI 370 in the Bain Pasture is in impaired condition, representing about 2% of the allotment. Low levels of graminoid cover, as compared to TES potential, and soil organic matter in the interspace has reduced nutrient cycling as indicated by the VGC levels and their spatial distribution along with soil organic matter levels within the A-horizon. Overland flow has increased resulting in continuous flow patterns that have caused elevated soil instability. Soil loss has resulted in the partial loss of the A-Horizon as evident by shrub hummocking. High shrub cover may be one contributing factor impeding some graminoid recruitment within the soil interspaces and contributing to soil instability.

TEUI 475, which is found in the Cherry and Horse Pastures and represents about 28% of the allotment acreage, is in satisfactory soil condition. Soils are on very steep slopes which make them vulnerable to instability. However, the dense chaparral produces ample litter to stabilize soils and promote hydrologic and nutrient cycling. Rock armoring acts as a stabilization agent in some areas of this TEUI.

TEUI 481, found in the Big Pasture and representing 2% of the allotment acreage, exhibits satisfactory soil condition. These soils are inherently unstable due to erosive parent material and moderately steep gradients. Soil loss above natural conditions, in conjunction with inherent instability, is occurring as indicated by erosion pavement patches, pedestaling, and some rill erosion. However, infiltration rates have not been reduced and vegetative ground cover is well distributed across the landscape.

Direct & Indirect Effects on Soils:

The effects analysis predicts a soil condition trend but does not necessarily identify a change in soil condition class. There are many factors that influence soil condition processes and changes in soil function are variable and could take up to 100 years on some soils associated with unsatisfactory condition. However, extraneous factors and TEUI potentials were considered when predicting soil condition classes associated with each alternative within a 10-year time frame.

Alternative 1 - Proposed Action

Bain Pasture – TEUI 370. The Bain Pasture would be used for a short duration resulting in light utilization levels and minimize concentrated use. Additional biomass would be retained on site to allow organic matter to be incorporated into the soil for nutrient cycling and ground cover for

soil protection from elevated soil loss. Vegetative ground cover levels are expected to increase along with their spatial distribution. Soil conditions would move toward improvement but would remain in impaired condition because shrub cover would continue to limit the soil's capability to recruit additional graminoid cover and organic matter needed to achieve satisfactory conditions.

Big & Portion of Horse Pasture (Cellar Basin); Knight & Portion South Paxton Pastures (Campbell Flat) - TEUI 363. The unsatisfactory soil conditions are expected to improve within their attainable potential, but not as quickly as described in *Alternative 2: No Grazing*. Resource guidelines of constructing additional water improvement and lowering utilization levels would be implemented. Increased graminoid cover is expected to result from implementation of activities which limit livestock use levels within these areas and assist in retaining additional soil and surface organic matter. Load bearing stress associated with concentrated livestock use patterns would be minimized due to improved livestock distribution from additional livestock water. This would alleviate soil compaction and improve soil structure, improve nutrient cycling, decrease run-off, and assist in stabilizing accelerated soil loss. Soil conditions on Cellar Basin within the Big and portions of the Horse Pastures are expected to remain in unsatisfactory condition. This map unit has passed an ecological threshold due to sustained historical disturbance creating a disclimax ecological potential that differs from natural conditions (Robertson 2000). Hence, the severe compaction would continue to limit the soils ability to improve beyond unsatisfactory condition.

Soils located in the Knight pasture and portions of Southwestern Paxton Pasture are also expect to improve as described above because of water development, pasture fencing, and lower utilization guidelines. In addition, gully stabilization, as described in the *Gully Stabilization – Knight Pasture* section would result in further soil condition improvement. Proposed gully stabilization efforts would be designed to minimize gully expansion and would restore soil functionality in an improvement to an impaired soil condition.

Big Pasture – TEUI 481. Soil conditions are expected to remain in satisfactory condition for this soil map unit. Elevated soil loss may continue to occur due to the inherent instability associated with these soils and seasonal biomass removal. However, utilization guideline would retain graminoid cover on the soil and allow vegetative ground cover to be distributed across the landscape. This would protect the soils from instability, reduce overland flow, and encourage nutrient cycling.

Cherry, North Paxton Pastures - TEUI 360. Satisfactory soil conditions would be maintained. Utilization guidelines would continue to retain biomass and consequentially allow the development of organic matter for soil protection. Proposed adaptive management measures associated with range improvement water developments would control and improve distribution. This would assist soil conditions by discouraging concentrated use which could negatively impact soil structure from hoof impact and cause higher consumption of vegetation biomass resulting in less vegetative ground cover for soil protection. However, the improvement of distribution through the development of water range improvements would assist in minimizing hoof impact upon soil structure and help maintain vegetative ground cover. This maintenance of ground cover would alleviate any potential elevated soil loss related to the severe erosion hazard rating. In addition, the hydrological capability would continue to remain functional and the nutrient cycling function would be maintained

Cherry and Horse Pastures – TEUI 475. Satisfactory soil conditions would be maintained. The dense shrub cover would continue to provide high litter levels for soil stability protection, favorable soil structure and infiltration, and nutrient cycling. Utilization guidelines would

continue to maintain residual graminoid cover within the shrub interspaces for additional soil protection. Shrub cover biomass and litter production would have extremely negligible to most likely no noticeable difference from livestock browsing as compared to *Alternative 2: No Grazing*.

Horse and Southwest Paxton Pastures – TEUI 360. Impaired soil conditions on the Horse Pasture are expected to improve to satisfactory. At the time of sampling the Horse Pasture in 2011, several indicators of soil function were in the satisfactory range and improvement of other indicators is expected under the proposed management. However, improvement of impaired conditions within southwest Paxton Pasture would improve but impaired conditions may be maintained or satisfactory soil conditions may be achieved. Proposed water developments would improve livestock distribution and assist in achieving lighter use levels in areas of past concentrated use. Lighter utilization guidelines would retain additional biomass and organic matter production to improve vegetative ground cover levels along with their spatial distribution that would improve nutrient cycling. This would also alleviate accelerated soil loss resulting in improvement to the stability and hydrologic soil function. Improvement of soil conditions in the southwest Paxton Pasture may not achieve satisfactory condition because graminoid cover is very low and recruitment of additional productivity may be limited due to the low precipitation affiliated with this climate zone.

Alternative 2 – No Action/No Grazing Alternative

Bain Pasture – TEUI 370. Soil conditions would move toward improvement because graminoid cover and organic matter production would be retained on the soil surface. Retention of graminoid cover would protect the soil surface from elevated soil loss and organic matter retention would be incorporated within the soil and allow nutrient cycling improvement. However, soil conditions would remain in impaired condition because the high shrub cover would continue to limit graminoid recruitment and the subsequent cover needed to achieve satisfactory condition.

Big & Portion of Horse Pasture (Cellar Basin); Knight & Portion South Paxton Pasture (Campbell Flat) - TEUI 363. The unsatisfactory soil conditions associated with Cellar Basin in the Big Pasture and portions of the Horse Pasture are expected to improve because no livestock grazing would occur but would remain in unsatisfactory condition. This map unit has passed an ecological threshold due to sustained historical disturbance creating a disclimax ecological potential that differs from natural conditions (Robertson 2000). Hence, the severe compaction would continue to limit the soils ability to improve beyond unsatisfactory condition. Graminoid 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 a decrease in run-off and soil stability.

Soil conditions associated with the Knight Pasture and portions of the southwest Paxton Pasture are expected to improve as described above and to a greater extent than *Alternative 1: Grazing*. However, if gully stabilization does not occur, active gullying would continue and the soil stability function would remain non-functional, resulting in unsatisfactory soil condition. Active gullying would continue until equilibrium of run-off, sediment production, vegetation ground cover retention, and angle of repose is gained. If gully stabilization practices were to occur the soil functionality would improve resulting in an impaired soil conditions as described in *Alternative 1: Grazing* section.

Big Pasture – TEUI 481. Soil conditions would remain in satisfactory condition for this soil map unit. Graminoid biomass and its associated organic matter would remain on the soil surface to protect them from soil instability, reduce overland flow, and encourage nutrient cycling. However, inherent soil instability is expected to continue to occur due to erosive parent material and moderately steep to very steep gradients.

Cherry, North Paxton Pastures - TEUI 360. The soils would remain in satisfactory condition in these pastures as described in *Alternative 1: Grazing*, but to a greater extent. All residual biomass would be retained on site because of no livestock grazing. The retention of the additional biomass and organic matter would protect the soils with a severe erosion hazard from elevated soil loss, promote the hydrologic function, and allow nutrient cycling.

Cherry and Horse Pastures – TEUI 475. Soil conditions in these locations would be similar as described in *Alternative 1* and remain in satisfactory soil condition. Measurable differences of soil conditions associated with *Alternative 1: Grazing* and *Alternative 2: No Grazing* would be difficult to discern. The dense shrub cover biomass and litter production would continue to provide soil stability protection, favorable soil structure and infiltration, and nutrient cycling. Graminoid cover would be retained within the interspace and provide additional soil protection, because no grazing would occur.

Horse and Southwest Paxton Pastures – TEUI 360. Soil conditions in these pastures are expected to improve at a quicker rate than described in *Alternative 1: Grazing*. Impaired soil conditions on the Horse Pasture are expected to improve to satisfactory. However, impaired conditions within southwest Paxton Pasture would improve but impaired conditions may remain or satisfactory soil conditions may be achieved. No livestock grazing would result in biomass and organic matter being retained on site. This retention of biomass and organic matter would improve vegetative ground cover levels along with their spatial distribution that would improve nutrient cycling. Accelerated soil loss would be alleviated, resulting in improvement to the stability and hydrologic soil function. Improvement of soil conditions in the southwest Paxton Pasture may not become satisfactory because graminoid cover is very low and recruitment of additional productivity may be limited due to the low precipitation affiliated with this climate zone.

Range Improvement Effects

Alternative 1, Proposed Action:

The installation and maintenance of range improvements has the potential to damage the soil resources associated with the footprint and small area near the range improvement but these adverse effects would be largely mitigated by implementing Best Management Practices. 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 productivity.

Alternative 2, No Grazing:

There would be no impacts to the soil resources from range improvement installation and maintenance because livestock grazing would not occur. However, the removal of range improvements has the potential to negatively impact the soil resources but these impacts would be largely mitigated by implementing Best Management Practices. 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 productivity.

Implement Gully Stabilization in Knight Pasture and Indian Spring:

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 instability. Proposed gully stabilization efforts would be designed to minimize gully expansion. This soil stabilization would improve soil stability to a point in which the soil stability is no longer non-functional but partially functional, resulting in an impaired soil condition.

Do Not Implement Gully Stabilization in Knight Pasture and Indian Spring:

If no erosion control measures were implemented in these locations, the soil stabilization and soil function recovery would not be expedited and unsatisfactory conditions would persist. 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. If soil stabilization measures are not implemented, active gulying would continue until equilibrium of run-off, sediment production, vegetation ground cover retention, and angle of repose is gained.

Cumulative Effects on Soil Resources

See the Cumulative Effects for Soil, Watershed Condition, and Water Resources on page 42.

Watershed and Water Resources

Existing Condition:

The Wagoner Allotment is within the Upper Hassayampa and Middle Hassayampa Watersheds 5th level Hydrologic Unit Code (HUC) nested within the Hassayampa River subbasin (4th level HUC). Portions of six 6th HUC watersheds are within the allotment: Milk Creek (only 19 acres in allotment), Moore's Spring-Upper Hassayampa River (only 188 acres), Blind Indian Creek (17,248 acres), Minnehaha Creek (5,308 acres), Cherry Creek (6,105 acres), and Oak Creek (1,722 acres).

Watershed condition includes both the upland portion of the watershed and the streamcourses with their associated riparian and aquatic vegetation. The analyzed portion of the allotment contains portions in both satisfactory and unsatisfactory watershed condition. The upland areas which were rated unsatisfactory are primarily TEUI 363 in the Big and Knight Pastures. A gully system with some active headcutting and lateral expansion is present in portions of TEUI 363 in the Knight Pasture. Within the Horse and the south portion of the Paxton Pastures it is rated as impaired, meaning that although it is not currently in satisfactory condition, it can more readily recover through management than if it were rated as unsatisfactory. Where impaired, and especially where unsatisfactory, the soil hydrologic functions of infiltration and percolation have been impacted, resulting in greater surface runoff from intense rainstorms, along with greater soil detachment and removal through erosion.

Blind Indian, Minnehaha, and Cherry Creeks are the primary drainages, flowing generally east to west through the allotment for a distance of 9.5, 9, and 8.5 miles, respectively. Each then joins the Hassayampa River at a distance of 1.5 to 1.75 miles downstream from the Forest boundary. In addition, Cellar Springs Creek is a significant tributary to Blind Indian Creek, with primarily intermittent and short reaches of perennial flow in the approximately 1.7 miles of reach

between the springs and Blind Indian Creek. As intermittent, they flow for several months each year as opposed to ephemeral, which flow only in response to storm or snowmelt events.

The riparian zone encompasses the stream channel between the low and high water marks and that portion of the terrestrial landscape from the high water mark toward the uplands where vegetation may be influenced by elevated water tables or flooding and by the ability of the soils to hold water. Obligate riparian herbaceous vegetation appeared to be most related to reliability of water rather than to whether it received use by livestock, with the exception of historic holding and concentration areas such as Indian Spring. For example, Cellar Spring, which is not fenced nor is there evidence of a previous fence, had a very reliable source of water and vigorous emergent vegetation. By contrast, the Blind Indian Creek livestock enclosure above Ross Spring had a generally ephemeral or short-term intermittent flow and very little obligate or facultative herbaceous vegetation along the streambank. The limited amount observed was just below a seep that erupted at a bedrock outcrop. Timing of livestock use may play a significant role in its effect. The terrain, abundant water, and lush forage would suggest Cellar Springs as an area of livestock concentration and use. For most of the last 20 years the Paxton Pasture, in which Cellar Springs is located, has been grazed in alternate winters from November or December through March followed by rest from April of that year to October of the following year.

In evaluating riparian conditions, the recent climatic and hydrologic history must be considered, as well as site specific variation within an individual streamcourse. Spatial and temporal availability of soil moisture within the rooting zone plus the periodic occurrence of scouring floods strongly affect the abundance, composition and age of riparian vegetation. The Proper Functioning Condition (PFC) assessment method (USDI BLM 1998) is the minimum standard for assessment of riparian condition (Thomas 1996). These assessments were conducted by an interdisciplinary team including hydrology, soils, and range ecology skills. The descriptive notes recorded as a part of this assessment help to provide additional, more specific information beyond the classification. Riparian evaluations are organized by 6th HUC watershed beginning with Blind Indian Creek and moving southward. Where more than one reach of a primary stream were evaluated, they are presented from uppermost moving downstream.

BLIND INDIAN CREEK 6th HUC - Three separate reaches were assessed on the mainstem of Blind Indian Creek and two on Cellar Springs Creek. In addition three springs were evaluated – Steamboat, Indian, and Rock Holding.

Blind Indian Creek within the Ross Enclosure, approximately 1.2 miles in length: This section was assessed to be in Proper Functioning Condition. Diverse species and age classes for woody riparian vegetation are present. Obligate herbaceous species such as sedges, rushes, and bulrushes, and facultative herbaceous species are limited to segments with the most reliable soil moisture. Sporadic clumps of tamarisk were noted. The channel is generally stable and effectively handles flow and heavy bedload.

Blind Indian Creek, downstream from Ross Enclosure, approximately 1 mile in length: This segment is found in the Big Pasture, and was assessed as being in Proper Functioning Condition. There is a dense canopy of diverse woody riparian species of varied age classes. Obligate riparian herbaceous species are present but limited in extent. Reproduction of woody riparian species was noted at the time of field survey. The channel is stable and effectively handles flow and heavy bed load, and there is considerable rock armoring of stream banks.

Blind Indian Creek downstream from Bain Enclosure, approximately 1.5 miles in length: This

stream reach is found in the Bain Pasture, and was assessed as a mix of Functional – At Risk and Nonfunctional segments. There are portions of this reach with intermittent flow (flows for part of the year) and some areas of ephemeral flow (flow in response to rainfall events only). There is variable density for obligate woody riparian species in the intermittent flow reaches. Obligate riparian herbaceous species are very limited, but some facultative species are present in intermittent flow reaches. There were seedlings present for riparian woody species indicating reproduction. Channel configuration and stability is variable along this reach.

Cellar Springs Creek, segments at spring source and above confluence with Blind Indian Creek: Both segments are found within the Paxton Pasture, and were assessed to be in Proper Functioning Condition. There is good diversity of obligate riparian herbaceous species such as sedges and rushes that hold fine sediments and protect stream banks. Obligate woody riparian species are present in multiple age classes. No invasive species were noted. The channel is stable and effectively handles flows and sediment from the watershed above. The uppermost portion of the reach near the spring source is somewhat marshy with a high water holding capacity.

Steamboat Spring: This spring and its associated drainage channel are found in the Horse Pasture. The approximately 0.2 mile reach was assessed to be in Proper Functioning Condition. There were diverse obligate riparian woody species present, and vigorous deergrass plants along the channel where it was not rock armored. The channel is stable and effectively handles flow and heavy bed load from the watershed.

Indian Spring, between Big and Horse Pastures: Channel erosion and active headcutting is present in both channels which converge in an alluvial area surrounding springs. Records indicate springs have been a primary water source in Cellar Basin for many decades. A stockman's cabin and 40-acre holding trap tied to springs was approved in 1931. The springs area is currently fenced. There is a lack of herbaceous component and woody recruitment. Vegetation is shifting toward a more xeric plant community as the site is dewatered by active downcutting in gullies. This site is not functioning properly and will continue downward trend unless the gully system can be stabilized.

Rock Spring, Rock Holding Pasture: This spring site is similar to potential and has a vigorous stand of deergrass along the channel. There are scattered cottonwood and willow along the lower portions of the drainage. The channel appears stable.

MINNEHAHA CREEK 6th HUC – Two segments of Minnehaha Creek were assessed as well as one spring.

Minnehaha Creek above Baldy Trap, approximately 0.3 mile segment: This reach is located in the Cherry Pasture, and was assessed to be in Proper Functioning Condition. Obligate woody riparian species are somewhat sparse in distribution but there is adequate diversity of species and multiple age classes. Deergrass is the primary herbaceous species. A few clumps of saltcedar were noted. The channel is stable and effectively handles sediment load. Rock armoring provides much of the channel stability.

Minnehaha Creek, vicinity of Minnehaha Spring, approximately 0.5 mile segment: This reach is in the Paxton Pasture and was assessed to be in Proper Functioning Condition. Riparian vegetation includes both obligate and facultative species, and there is good diversity of woody species. Emergent herbaceous vegetation is variable depending on surface water availability.

Some clumps of saltcedar observed. The channel is generally stable, although there are some short inclusions of lateral bank erosion and sandbar deposition.

Minnehaha Spring, Paxton Pasture: This is a developed spring emerging from a framed dugout opening in an upland hillside, with surface water flowing into a downslope area of saturated soil approximately 0.1 acre in size. The spring area was assessed as being generally similar to the site potential. Both obligate and facultative wetland herbaceous vegetation was observed.

CHERRY CREEK 6th HUC – Two reaches of Cherry Creek were assessed plus two developed springs.

Cherry Creek below Cherry Springs, approximately 0.1 mile segment: This reach is in the Paxton Pasture, and was assessed as being in Proper Functioning Condition. There is good diversity of both woody and herbaceous riparian species, although old growth woody species were not present. The channel is stable and stream banks are protected with herbaceous vegetation or rock armoring.

Cherry Creek lower segment approximately 0.2 miles in length: This reach is in the Paxton Pasture and was rated as Non-functional. Cherry Creek is ephemeral through the lower segment, with a braided channel and evidence of active bank cutting. Cottonwood and willow are present in narrow stringers along banks, and some seedlings were noted. Herbaceous vegetation is limited, but there appears to be potential for some facultative species such as deergrass. The channel does not appear stable due to active bank cutting.

Campbell Flat Spring, Campbell Flat Holding Pasture: This spring site has a dense woody overstory of cottonwood, willow, and ash that extends about 1/8-mile downstream from the spring source. There are obligate riparian herbaceous such as sedges present. There is fencing around the spring source and water is piped to a concrete trough outside the riparian area. The spring site was assessed as similar to the site potential, and livestock grazing is not an influence.

Ridges Spring, Paxton Pasture: This spring emerges at the base of a cliff on a hillside. Water is piped from the fenced spring source to a trough outside the enclosure, and additional pipeline carries the water to a storage tank and trough approximately ½-mile from the spring. The spring has been dug out and a pond liner added, which creates a marshy habitat with dense aquatic vegetation including cattails. Livestock grazing is not influencing the spring source.

OAK CREEK 6th HUC – The channel area of Oak Creek in this watershed is in TEUI 47 which describes it as an Emory oak – blue grama vegetative association. It is generally a dry sandy channel with Emory oak, mountain mahogany, mountain laurel, manzanita and occasional desert willow near and along the channel and scattered upland grasses. The road follows the channel through most of its course through the Cherry Pasture.

Water Quality:

Within the allotment there is no identified water quality data. Stream segments below the project area were assessed by Arizona Department of Environmental Quality (ADEQ) in the 2010 Status of Water Quality Arizona's Integrated 305(b) Assessment and 303(d) Listing Report, December 2011 to determine if Beneficial Uses were being met. A summary of this assessment for each of the segments is discussed below:

1. Hassayampa River from Copper Creek to Blind Indian Creek

Blind Indian Creek's confluence with the Hassayampa River is the lower end of this 20 mile segment. It was sampled between 2004 and 2005. Although no exceedances were found, it was assessed as inconclusive for all beneficial uses due to inadequate samples for coverage of all seasons (ADEQ, 2011). One sampling point was at the confluence with Blind Indian Creek. Copper Creek is approximately 20 miles upstream from the confluence of Blind Indian Creek with the Hassayampa.

2. Hassayampa River from Cottonwood Creek to Martinez Wash

This reach begins 1.7 miles below Blind Indian Creek and extends for approximately 32 miles downstream. Cherry Creek enters the Hassayampa about ½ mile below Cottonwood Creek and Oak Creek approximately 3 miles below it. It was sampled between 2004 and 2008 and assessed as attaining all designated uses except Aquatic and Wildlife warmwater, which was Inconclusive. Among a number of samples, one exceedance each of dissolved oxygen and *E. coli* bacteria was found in the lower portion of this 32 mile reach and more samples were recommended. Minnehaha Creek enters the Hassayampa between these two assessed reaches.

3. Minnehaha Creek from headwaters to Hassayampa River

One sample was taken by ADEQ in March 2005 just ¼ mile above the confluence with the Hassayampa River. There were no exceedances. However, because there is only one sample in the ADEQ data base it is classified as inconclusive.

Effects Common to All Alternatives:

Neither alternative is expected to affect water quantity generated from the project area. 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. It also includes several water developments to improve livestock distribution and reduce dependence on perennial or long term intermittent reaches of streams usually located downstream from springs which emerge into channels. New or reconstructed spring developments will incorporate Best Management Practices. Livestock exclosure fencing may be constructed at spring/seep riparian areas if desired conditions are not achieved through the control of livestock grazing. Exclosure fencing will be designed and constructed to protect the important riparian vegetation while still providing for livestock water.

The alternative incorporates Best Management Practices specified as resource protection guidelines which should result in vegetative improvement in both the uplands and riparian areas. On the upland areas, increased vegetative cover will gradually lead to increased infiltration and percolation rates and reduced soil erosion. Under adaptive management with its available tools, the upland areas with current satisfactory watershed condition, e.g., TEUI 481 in Big, TEUI 360 in Cherry and Paxton, et al, should continue. The areas identified currently in impaired condition, e.g., TEUI 360 and 363 in Horse Pasture, will gradually improve with more

intensive management and implementation of the resource protection guidelines. This should result in increased ground cover of perennial herbaceous – primarily grasses – and litter. In addition, organic material within the soil, including roots and associated biologic activity, would help to reduce soil compaction and its effect on soil structure. The hydrologic effect would be increased rates of water infiltration and percolation, which would have a corollary effect of reducing soil detachment and erosion. Those currently in unsatisfactory condition – TEUI 363 in Cellar Basin and in the Knight Pasture in the Cherry Creek watershed -- are expected to improve very slowly due to the harsh environment and the long period of historic impact. 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.

Stream segments with intermittent flow which are currently assessed as Functional-At Risk should improve to Proper Functioning Condition. The ephemeral reaches currently assessed as Nonfunctional should, for the most part, improve to Functional-At Risk. Gully erosion control measures at Indian Springs have the potential for major riparian improvement of both woody species and obligate herbaceous. The water source, the presence of developed hydric soils, and woody riparian immediately downstream indicate a potential for significant improvement. The current lack of ecological function should be reversed.

Construction of Improvements -

Effects of constructing new improvements will be localized and temporary. Best Management Practices will be applied in access, construction, and maintenance of improvements. UTV's for access and delivery of materials used in spring developments will cause relatively little surface soil disturbance due to the low bearing weight and the amount of rock on the soil surface. Depending on the specific water developments determined and designed, a crawler tractor may be required for some developments, e.g., the new development near the north boundary of the allotment north of Blind Indian Creek. Access during times when soils are not saturated will limit effects.

Water Quality –

Effects to on-site (within allotment) water quality will be to slightly 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 15 percent of the watershed area of the Upper Hassayampa River 5th level HUC. As displayed under Existing Condition, ADEQ sampling of the segments of the Hassayampa River into which Blind Indian, Minnehaha, and Cherry Creeks empty has found no exceedances of standards in the portions of these reaches near the point where these streams enter the Hassayampa. However additional samples are needed to cover the seasonal requirements for assessment.

Alternative 2 – No Action/No Grazing Alternative

No permit would be issued and cattle would not be authorized to graze. 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 Wagoner Allotment. It will result in slightly more rapid vegetative recovery in the upland areas than Alternative 1 and slightly more rapid herbaceous recovery of hydrophytic species along the greenline, where present, and with some gradual expansion expected. However, as stated under Existing Condition, the season-long availability of soil moisture appears to be the most limiting factor for obligate herbaceous vegetation. Areas having the greatest current upland impact, e.g., TEUI units Unit 363 and 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.

Water quality effects would be generally similar to, but slightly greater than, Alternative 1.

Cumulative Effects on Soil, Watershed Condition, and Water Resources

In this analysis, watersheds are used as the basis to evaluate the cumulative effects of projects on soil, riparian ecosystems, and water quality/quantity. The cumulative effects analysis area for the Wagoner Allotment Project is the 6th Level HUC watersheds that include the project area.

Management activities, inherent properties, aquatic conditions, and natural disturbances affect vegetation, soils, riparian, water quantity/quality and ultimately watershed condition. Water quality data within each identified watershed, coupled with the current conditions, were used as a barometer to evaluate the cumulative effects of this project upon soil and watershed resources when added to other past, present, and foreseeable future action(s) shown in the table on pages 23-24, regardless of what entity is responsible for the action(s). Those activities occurring in the watersheds that may impact soil, watershed condition, or water resources include livestock grazing, wildfire suppression, prescribed fire, roads, recreational activities, and mining. There are no vegetation nor timber management activities in the recent past nor any planned for the watersheds.

Livestock grazing occurs throughout the cumulative effect watersheds. Improper management of livestock has the potential to impact watershed health by degrading soil and vegetation conditions. However, all land management agencies have grazing management plans that provide for vegetation, soil, and water quantity/quality health. Wildland fire poses a threat to watershed resources by decreasing vegetative ground cover levels, potentially causing hydrophobic soil surface conditions, and accelerating run-off, erosion rates, and sediment production. The Gladiator Fire of 2012 impacted portions of the Blind Indian and Minnehaha 6th HUCs, but did not reach the allotment itself. Prescribed burning has the potential to temporarily decrease vegetation productivity and increase run-off, soil loss, and sedimentation. However, burn prescriptions occur during favorable burn periods (e.g. favorable weather conditions and planned burn blocks resulting in favorable fire behavior) and Best Management Practices are implemented to minimize negative impacts. Prescribed fire can also lead to the improvement of vegetation, soil, and watershed resources by improving nutrient cycling, vegetation vigor, and vegetative ground cover.

Roads concentrate precipitation run-off and can be a major source of sediment impacting watershed condition by impacting water quality and quantity. Road prisms have a direct impact on soils and also have a connected indirect effect of concentrating water that may result in soils adjacent to roads experiencing gullying and sheet erosion. This ultimately impacts vegetation cover, composition, and diversity. Road impacts to vegetation, soil, and water resources are highly dependent on the maintenance level of the roads, road closure techniques, and road construction practices. Recreation disturbance can impact and change vegetation population dynamics and can also expose, compact, displace, and create unstable soil conditions that could potentially increase run-off, erosion, and sedimentation. Disturbances affiliated with mining expose, compact, displace, and create unstable soil conditions that could potentially increase run-off, erosion, sedimentation, and negatively impact vegetative productivity. This also has the potential to impact vegetation dynamics. Some locatable mining operations have the potential to create heavy metal contaminants, and high sulfide levels which can lead to water quality degradation through decreased pH levels.

The proposed project would incrementally improve the cumulative effects because it would result in a gradual 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 Wagoner Allotment would not add to the cumulative watershed effects of the other listed actions.

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 information from the ADEQ assessment indicates that the waters of the Hassayampa River are not on the threshold of being impaired. Very slight and temporary amounts of sediment might occur as a result of soil disturbance in construction of range improvements. The largest cumulative effect is the temporary increase in sediment and turbidity from Blind Indian Creek as a result of the recent Gladiator Fire, and to a much lesser degree, the Ash Creek prescribed burn. However, as these will only occur during storm flows, they should not trigger violation of water quality standards for suspended sediment.

Wildlife, Aquatic Species, and Rare Plants_____

Wildlife Habitat:

The main vegetation types on the Wagoner Allotment consist of semi-desert grassland and desert scrub mix, interior chaparral, and pinyon/juniper with chaparral. Riparian areas are found along several major stream courses including Blind Indian Creek, Cellar Springs Creek, Minnehaha Creek, and Cherry Creek.

The process to determine species occurrence included review of the Prescott National Forest (PNF) Threatened, Endangered, and Sensitive (T,E, &S) species list and wildlife observations. Arizona's Heritage Data Management System (HDMS) information was queried for T,E, & S species occurrences within an adjacent to the project area. Upon review of PNF habitat data, it was determined that Federally listed species under the ESA, their designated or proposed critical habitat, and species proposed for listing/candidates for listing do not occur in the project area. There would be no effect to Mexican Spotted Owl Critical Habitat under the Proposed Action or the No Grazing alternative. The small portion of habitat on the allotment is in very steep terrain not accessed by livestock.

Sensitive plants were surveyed within and adjacent to the allotment in 2002-2003 by M. Baker (2003). Aquatic species occurrences were also identified from various sources (Desert Fishes Team 2004, Emmons and Nowak 2012). Species or their habitats known in the Wagoner Allotment or potentially impacted by actions in the project area are listed in the following table.

Species occurrence in or adjacent to the Wagoner Allotment

Scientific Name	Common Name	Status ¹
<i>Strix occidentalis</i>	Mexican spotted owl critical habitat	USFWS
<i>Buteogallus anthracinus</i>	Common black hawk	FS
<i>Pipilo aberti</i>	Abert's towhee	FS
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	C, FS
<i>Lasiurus blossevillii</i>	Western red bat	FS
<i>Nyctinomops femorosaccus</i>	Pocket free-tailed bat	FS
<i>Corynorhinus townsendii pallescens</i>	Pale Townsend's big-eared bat	FS
<i>Gopherus agassizi morafkai</i>	Sonoran (Morafka's) desert tortoise	C, FS
<i>Agave delamateri</i>	Tonto basin agave	FS
<i>Anaxyrus (Bufo) microscaphus</i>	Arizona toad	FS
<i>Lithobates (Rana) yavapaiensis</i>	Lowland leopard frog	FS
<i>Catostomus clarki</i>	Desert sucker	FS
<i>Agosia chrysogaster</i>	Longfin dace	FS
<i>Pipilo maculatus</i>	Spotted towhee	MIS
<i>Odocoileus hemionus</i>	Mule Deer	MIS
<i>Vermivora luciae</i>	Lucy's warbler	MIS
<i>Macroinvertebrates</i>	Macroinvertebrates	MIS

1. USFWS = US Fish and Wildlife Service designation; C = USFWS Candidate species; FS = Forest Service sensitive species; MIS = LRMP management indicator species.

Direct & Indirect Effects Regional Forester Sensitive Animal Species:

Comments were received from the U.S. Fish and Wildlife Service, Arizona Ecological Services office, during scoping of the proposed action on the potential for Morafka's tortoise presence within the allotment. Although no formal surveys have been done, Morafka's desert tortoise was not observed during field reconnaissance in 2011 & 2012. The Arizona HDMS layer on the PNF Geographic Information Systems (GIS) corporate database did not show any occurrence within 5 miles south and/or west of the allotment boundary. When using the Arizona HDMS program online, the map clearly illustrates multiple sightings/locations where they exist which appear to follow along an elevational and/or ecotype boundary, but the map does not allow you to discern the exact location. Therefore based on the HDMS layer in our corporate database, it appears suitable Morafka's desert tortoise habitat does not exist within the analysis area and there is very little chance Morafka's desert tortoise inhabits the semi-desert grassland/shrub habitat found in Wagoner Allotment

The following table summarizes the Region 3 Sensitive species analyzed in detail and the effect/impact determinations for each alternative.

Summary of effects for Region 3 Forest Service sensitive species that may occur within or near the Wagoner Allotment.

Species Name	Status	Alternative 1 Proposed Action	Alternative 2 No Action
Common Black Hawk	Sensitive	No Impact	No Impact
Abert's towhee	Sensitive	MIH	No Impact
Western Yellow-billed Cuckoo	Sensitive	No Impact	No Impact
Western red bat	Sensitive	No Impact	No Impact
Pale Townsend's big-eared bat	Sensitive	No Impact	No Impact
Pocket free-tailed bat	Sensitive	No Impact	No Impact
Sonoran desert tortoise	Sensitive	No Impact	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

Livestock grazing can affect wildlife and their habitat through direct competition for forage, alteration of wildlife habitat structural components, trampling of nests or young, or disturbance and displacement of individuals due to the presence of livestock. The analysis of effects is based on how the action of the alternatives may affect species and their habitats in the project area. For the proposed action, a term grazing permit would be issued for up to ten years. The permit would authorize livestock use within parameters of the proposed action. Subsequent permits may be issued as long as resources continue to move further toward desired conditions or are being maintained in satisfactory condition. It incorporates monitoring of the various resources, adaptive management principles, range structural improvements, resource protective measures, and best management practices.

In riparian areas, livestock grazing in the short-term may reduce insect diversity and suitable habitat by reducing herbaceous ground cover, riparian tree/shrub density and recruitment. Minimum stubble heights on riparian herbaceous species of 4-6" would maintain vegetative cover. Forage use of 20% on riparian woody species would maintain tree structure and root masses to protect streambanks and provide for maintenance of aquatic and riparian habitat used by the species. Proposed water developments in the uplands would reduce livestock dependence on stream perennial reaches. Additional measures may be implemented in riparian areas if desired conditions are not met through livestock management and include fencing that would eliminate direct livestock grazing impacts to species and their habitat.

There would be livestock grazing short-term impacts to vegetation and soil conditions in the uplands of the project area. The establishment of conservative utilization standards on upland areas in satisfactory condition, and the implementation of lighter grazing intensities on those areas not meeting desired conditions should result in vegetative improvement. Habitat conditions are expected to improve under the proposed action in those areas not currently meeting desired resource conditions.

Cumulative Effects on Regional Forester Sensitive Animal Species

The cumulative effects analysis area for the Wagoner Livestock Grazing Project includes the 6th Level HUCs watersheds that include the project area. Projects considered for cumulative

effects to wildlife and their habitats for this analysis include wildfire suppression, fire and fuels projects including prescribed burning, livestock grazing, water improvements, recreational activities, roads, and mining. The majority of the watershed acres are within Forest Service and other federal ownership. Management actions on these lands adhered to agency direction, objectives, and resource protection measures to minimize impacts to natural resources. The activities considered in the cumulative effects analysis may modify or remove vegetation structure, which can cause a temporary loss of habitat. Burning of shrubby vegetation can increase the nutritional value of fire tolerant species. Fire can remove large woody debris and plant litter that can serve as habitat. Fire suppression and prescribed burning activities can cause disturbance to wildlife from people and equipment. Recreational activities are limited in the project area, but can also cause displacement from human disturbance. Water improvement construction can cause minor and temporary impacts to vegetation, or riparian habitat in the case of spring developments. Improved water availability can improve habitat quality. Most wildlife will habituate to the existing roads, but habitat quality and use along and adjacent to roads drops as the road density increases. Mining activities in streams can disrupt existing aquatic habitat. Human activity and noise from mining can displace wildlife. Authorization of livestock grazing, as described with the adaptive management tools resulting in improvement towards or maintenance of desired conditions, in conjunction with the cumulative past, present and future activities would maintain suitable habitat for the wildlife species considered in this analysis.

Management Indicator Species:

The Forest Service is required to address MIS in compliance with various regulations and Agency policy (36 CFR 219, Forest Service Manual (FSM) 2621 and 1920), which are, themselves, tiered to the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the NFMA. The Prescott National Forest Plan was prepared under planning regulations issued in 1982. Effects to MIS were considered for this project and are documented in this report.

Summary of effects on management indicator species (MIS) analyzed on the Wagoner Allotment.				
Species – Indicator habitat	Proposed Action Alternative 1		No Action Alternative 2	
	Project Level Effects	Forest-wide Trends	Project Level Effects	Forest-wide 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 slightly 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.

Summary of effects on management indicator species (MIS) analyzed on the Wagoner Allotment.				
Species – Indicator habitat	Proposed Action Alternative 1		No Action Alternative 2	
	Project Level Effects	Forest-wide Trends	Project Level Effects	Forest-wide Trends
Spotted Towhee – late seral chaparral	No change in habitat quantity of late-seral chaparral. Habitat quality should not be impacted from seasonal, rotational grazing system. Soil DFCs are to improve vegetative ground cover.	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.
Lucy's warbler – late seral riparian Macroinvertebrates aquatic habitat late seral riparian	No change in habitat quantity of late-seral riparian habitat or aquatic habitat. With the resource protection measures, habitat quality for these MIS would be maintained or improved.	No effect to forestwide habitat or population trends.	No change in habitat quantity of late-seral riparian habitat or aquatic habitat. More rapid improvement in riparian and aquatic habitat quality.	No effect to forestwide habitat or population trends.

Migratory Birds

The Forest Service is required to address the effects of agency actions and plans on migratory birds and identify where unintentional take reasonably attributable to agency action is having, or is likely to have, a measurable negative effect on migratory bird populations. Effects to migratory birds were considered for this project and are documented in this analysis.

Important Bird Areas (IBAs) and Overwintering Areas:

The nearest IBA to the Wagoner Allotment is located 20 miles away in the Agua Fria National Monument; therefore no IBAs are affected by the implementation of the proposed action and associated activities. Many overwintering areas are large wetlands; none of this habitat is present in the analysis area. The allotment provides limited wintering habitat for migrant bird species and can be a staging area for winter migrants before they migrate south for the winter. Since significant concentrations of birds are not known to occur here nor do unique or a high diversity of birds winter here, there will be no effects to important overwintering areas by implementing the proposed action.

Bald & Golden Eagle Protection Act of 1942

The Forest Service is required to address the effects of agency actions and plans on eagles protected under this law. Effects to eagles were considered for this project and are documented in this analysis.

Summary of Effects for Eagles and Migratory Birds for the Wagoner Allotment			
Species	Status	Alternative 1 Proposed Action	Alternative 2 No Action
Bald and Golden Eagle Protection Act:			
Bald & Golden eagles	Protected	No Take	No Take
Migratory Bird Treaty Act:			
Migratory birds	-----	Compliance	Compliance

Recreation

Existing Condition:

Recreation opportunities exist within the Wagoner Allotment because it attracts people who seek recreation experiences in a scenic, remote area. Four trails are within the Wagoner Allotment. There is about 0.6 mile length of Trail 9211, known as the Blind Indian Connection Trail within the Allotment and about 4.5 miles of Trail 211, the Blind Indian Trail. Trail #213, the Wagoner Trail, has about 6.6 miles of trail in the allotment. Cherry Creek Trail #214 is about 4.8 miles long and the entire trail is within the allotment. All four trails are used for hiking, horseback riding and motorized vehicle recreation (dirt bikes, OHV's and ATV's).

The Recreation Opportunity Spectrum (ROS) is a land classification system that categorizes National Forest System land into six recreation classes; Primitive, Semi-primitive Non-motorized, Semi-primitive Motorized, Roaded Natural, Rural, and Urban. The ROS divides areas by determining the recreational experience that is likely to occur, or does occur, within the designated boundaries.

Within the boundaries of the Wagoner Grazing Allotment, 2 ROS categories have been designated: *Roaded Natural* (4,580 acres) and *Semi-Primitive Motorized* (25,891 acres). Semi-Primitive Motorized means that a moderate probability for experiencing solitude, closeness to nature, and tranquility in a predominately natural appearing environment is likely to occur for visitors that recreate in this category. Roaded Natural category means a visitor may have an opportunity to affiliate with other users in developed sites but there is some chance for privacy. The area gets very little dispersed recreation use (e.g. camping, driving, motorized recreation vehicles, trail use, etc.). The area gets used lightly during hunting season.

Inventoried Roadless Areas:

The Blind Indian Creek inventoried roadless area (IRA) was established in 1979. There are 15,013 acres of this IRA in the Wagoner Allotment.

Wild and Scenic Rivers:

There are no rivers that are or could be designated as "Wild and Scenic" in the area of the Wagoner Allotment.

Direct & Indirect Effects on Recreation:

Alternative 1 - Proposed Action

Cattle may be encountered when using trails and cow droppings may be noticed on the 4 trails in the allotment. Visitors may see cattle when they are involved in dispersed recreation activities.

The Recreation Opportunity Spectrum (ROS) would not be affected by re-issuing the grazing permit and the area would continue to be classified as it is currently.

Installing the new improvements within the Blind Indian Inventoried Roadless Area would not require building of new roads or reconstruction of old roads.

Alternative 2 – No Action/No Grazing Alternative

Most recreationists would probably not notice that the area was no longer used to graze cattle. No cattle would be encountered when hiking trails and signs of grazing (e.g., cattle droppings) would be found in areas that recreationists visit.

The recreation opportunity spectrum (ROS) would not change the current classifications if there were no cattle within the project area.

Blind Indian Creek inventoried roadless area would not change.

Cumulative Effects on Recreation Resources

The effects of all past, present, and reasonably foreseeable actions that have taken/will take place within the Wagoner Grazing Allotment would not change the ROS settings or the Inventoried Roadless Area, thus does not affect visitors experience when recreating in this area.

Heritage

Existing Condition:

Based on the PNF heritage resource atlas and files from 1987 to the present, heritage specialists and para-archaeologists have conducted 13 heritage resource inventories within the allotment. Survey area was generally small in size; surveys were conducted prior to the implementation of range projects (5), mining projects (4), a wildlife project (1), and road maintenance or closure projects (3). Prior to 1987, para-archaeologists conducted 15 inventories but those inventories do not meet the current heritage inventory standards and the acreage will not be included in this analysis. Based on the 13 inventories, only 140 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.

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 85 years and at numbers higher than current levels. The Forest Service's proposed action for livestock grazing does not recommend changing to a more intensive grazing system nor does it recommend increasing the number of livestock.

The following range projects are proposed to be implemented within the next 2 years. All 3 projects have been surveyed for heritage resources. Access for these projects will be along existing dirt roads and a FS trail. No road or trail maintenance has been requested.

1. Within the Big Pasture, construction of an earthen stock tank at the north end of the pasture. This water source will be known as Ross Tank.
2. Within the Horse Pasture, construction of 0.45 miles of drift fence.

3. Along the boundary of the Horse and Cherry Pastures, construction of water facilities consisting of a trick tank, storage tanks, pipelines, and troughs.

Based on these three proposed projects, heritage specialists have intensively surveyed an additional 10 acres which brings the total acreage surveyed to 150 acres. No heritage sites are present in the three range development locations. In the future, when additional range improvements or other ground disturbing management practices are needed, 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 between the USDA Forest Service Region 3, the State Historic Preservation Officers of AZ, NM, TX, and OK, and the Advisory Council on Historic Preservation, signed 12/24/2003, and specifically, Appendix H: the Standard Consultation Protocol for Rangeland Management, signed 05/17/2007 and be in compliance with all applicable provisions of Section 106 of the NHPA.

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

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:

Individuals/Groups

Center for Biological Diversity
Don Glasgow
Erik Ryberg
Friends of Anderson Mesa
Hunt & Johnson Cattle Co.
Jeff Burgess
Rex and Ruth Maughan
Trip Carter
WildEarth Guardians

Federal and State Agencies

AZ Department of Environmental
Quality
AZ Game and Fish Department
AZ State Historic Preservation Office
AZ State Land Offices
USDA Natural Resource
Conservation Service
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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Loyd Barnett, Contract Hydrologist

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Dan Garcia de la Cadena, Wildlife
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Dorothy Baxter, Recreation Planner
Elaine Zamora, Archeologist
Linda Jackson, Bradshaw District
Ranger
Nancy Walls, Forest Natural
Resources Staff Officer
Thomas Potter, GIS Coordinator

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APPENDICES

Appendix 1 - Allotment Map

Appendix 2 - Actual Use, 1984-2011

Appendix 3 - List of Range Improvements

Appendix 4 – Glossary of Terms

Appendix 5 – Cumulative Effects Area Map

Appendix 1 – Allotment Map

See Allotment Proposed Action Map on the preceding page.

Appendix 2 - Actual Use, 1984-2011

Actual Use on the Wagoner Allotment, 1984 – 2011.

YEAR	ANIMAL-MONTHS	YEAR	ANIMAL-MONTHS
1984	1912	1998	1424
1985	1815	1999	----
1986	1914	2000	1820
1987	1579	2001	1771
1988	----	2002	1529
1989	1111	2003	----
1990	1420	2004	1450
1991	766	2005	1614
1992	981	2006	942
1993	1827	2007	613
1994	1513	2008	938
1995	1458	2009	1278
1996	1279	2010	594
1997	1302	2011	150
AVERAGE	1,320 Animal Months per Year		

¹ Animal Months Use here is displayed as it relates to occupancy rather than forage consumed. (R3 direction on current Animal Month/Unit terminology, 2009')

Appendix 3 - List of Existing Range Improvements

Range Improvements on the Wagoner Allotment

TYPE	Improvement Number
Allotment Boundary Fences	Various; approx. 38 miles
Allotment Interior Fences	Various; approx. 30 miles
Handling Facilities - corrals	Various; approx.. 9
Dandy Wire Spring	321020
Dandy Spring Waterlot	321021
Butler Spring	321022
Butler Spring Waterlot	321023
Berry Spring	321024
Bain Spring	321026
Bain Spring Waterlot	321027
Indian Springs	321028
Indian Spring Waterlot	321030
Jackies Spring	321033
Jackies Waterlot	321056
Cherry Trap Spring	321036

TYPE	Improvement Number
Cherry Spring Waterlot	321035
Ralphs Spring	321039
Ash Spring	321040
Ridges Spring	321041
Ridges Spring Waterlot	321019
Charlies Spring	321042
Rabbit Spring	321044
McCallister Spring	321045
Cambells Flat Spring	321047
Campbell Flat Waterlot	321046
Lawrence Spring	321048
Pine Spring	321049
Rock Spring	321051
Horse Spring	321052
Camp Bird Well	321043
Oak Creek Well	321057
South Fork Well	321090
LF Tank	321059
Mack Tank	321060
Pat Tank	321061
Bain Tank	321084
Lizard Tank	321085
Satoncactus Tank	321086
Wagoner Rock Dam	321081

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.

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 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.

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.

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.

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 result 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.

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 6th Code Watersheds Containing the Project Area

