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Environmental Assessment

Smith Canyon and Williamson Valley Grazing Allotments Management

Chino Valley Ranger District, Prescott National Forest
Yavapai County, Arizona



**View of Cedar Mesa on the Smith Canyon Allotment looking into
Cottonwood Canyon**

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1. Introduction

We are proposing to create allotment management plans for two allotments on the Chino Valley Ranger District of the Prescott National Forest. The two allotments are Smith Canyon and Williamson Valley and they are managed separately. We prepared this environmental assessment to determine whether effects of the proposed activities may be significant enough to prepare an environmental impact statement. By preparing this environmental assessment, we are fulfilling agency policy and direction to comply with the National Environmental Policy Act (NEPA)¹ and other relevant Federal and State laws and regulations.

1.1 About the Grazing Allotments

The Smith Canyon Allotment represents an area of approximately 48,000 acres. The allotment is located in the southwest portion of the district, approximately 17 miles west of Chino Valley, Arizona. Elevation ranges from 3,195 feet at the junction of Smith Canyon and Cottonwood Creek to ~6,200 feet on Sheridan Mountain. The topography is rough and broken on much of the allotment. There are a few areas providing flat to gentle slopes on mesa tops such as Smith Mesa in the northern portion and in the vicinity of Dillon Field. Over 80% of the allotment is in the Santa Maria River watershed and the remaining area is in the Big Chino Watershed. Major drainages include Smith Canyon and Cottonwood Canyon which are tributaries of the Bill Williams and Colorado Rivers. Riparian vegetation occurs along these stretches and is dominated by woody species such as cottonwood, velvet ash, and willows, with some areas of grass and grass-like vegetation where sediment has built up to form stream banks.

The Williamson Valley Allotment represents an area of approximately 49,000 acres. The allotment is located in the southwest portion of the district, approximately 16 miles west of Chino Valley, Arizona. Elevation ranges from 4,750 feet in Hitt Wash and Williamson Valley Wash on the eastern boundary to 7,200 feet on Camp Wood Mountain in the northwest corner of the allotment. The topography is rough and broken with some areas of gentle hills and wide washes along Hitt and Williamson Valley Washes in the northeastern portion of the allotment. Roughly two thirds of the allotment is in the Big Chino watershed and one third in the Santa Maria River watershed. Major drainages on the allotment include Pine Creek, Hitt Wash, and Williamson Valley Wash which are tributaries of the upper Verde River. Hitt Wash and Williamson Valley Wash have mainly herbaceous riparian vegetation such as sedges, rushes, horsetails, and other grass-like plants. There are localized areas of velvet ash, willow, sycamore, and cottonwood within riparian areas on the allotment.

Vegetation on both allotments consists primarily of piñon and juniper with evergreen shrub and interior chaparral plant species. Canopy cover from shrub species is moderately to extremely thick in some locations to the extent that herbaceous forage is reduced or absent. A portion of the forage base of the allotment is provided by browse species such as turbinella oak with mountain mahogany, deerbrush, and skunkbush found in smaller quantities. Perennial grasses can be locally abundant, especially in juniper woodlands that have been previously thinned, and on warmer southern aspects of hills. Important forage grasses on the allotments include blue grama, sideoats grama, threeawns, sand dropseed, tobosa, curly mesquite, and squirreltail.

Precipitation patterns for these areas are bi-modal with monsoon events occurring during the summer and a second period of precipitation occurring within the winter season. Precipitation at

¹ Code of Federal Regulations 36 CFR Part 220, Forest Service Handbook 1909.15, and Council on Environmental Quality regulations (40 CFR 1500).

the Chino Valley station recorded 13.7" for 2015, and likely ranges from 12-16 inches in the project area. The average minimum temperature typically occurs in December, and is around 20 degrees, and the average maximum temperature occurs in July at just over 90 degrees.

Recreational activity on these allotments is primarily associated with dispersed camping, off road vehicle use, and hunting. Access is not limited. There are some motorized trails on both allotments that receive some use from off-highway vehicles, although these trails are rough and used only by experienced riders. There are no developed recreation sites for camping on either allotment, though several areas receive heavy impact from dispersed camping, in particular the Camp Wood area on the Williamson Valley Allotment. Big game hunting opportunities exist for deer, elk, bear, turkey and javelina. There are no designated wilderness areas on either allotment.

1.2 How is Grazing Managed on the Prescott National Forest?

This Environmental Assessment (EA) is based upon background information about the allotments including current and past inventory and monitoring data, the desired condition of resources on the allotments derived from direction and guidelines in the Prescott NF Land and Resource Management Plan (Forest Plan), as well as from resource specialists' knowledge of the allotment. The Forest Plan was revised in 2015. This project is utilizing the direction in the new plan related to desired resource conditions and rangeland management. You can find the 2015 Forest Plan on the internet at:

http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3847427.pdf

The Forest Plan provides guidance for the management of multiple-use activities that occur within the Forest. There are standards, guidelines, and management area direction found within the plan, as well as statements related to the desired conditions for various resources such as vegetation, watersheds, riparian areas, soils, and wildlife. Grazing is one of the many uses allowed on the Forest. Forest Service policy is to make forage available to qualified livestock operators from lands suitable for grazing, provided it is consistent with land management plan and meets the terms of the administrative permit². The project area was determined as suitable for grazing during the Forest Plan revision process undertaken during the last several years.

2. Purpose and Need for the Project

2.1 What is the Purpose of this Proposal?

The purpose of this project is to create allotment management plans (AMP) on the two allotments comprising the project area that are consistent with the Forest Plan and will allow for desired resource conditions to be met. The allotments have been managed in the past by issuing operating instructions on an annual basis. There have not been AMPs in place that were in compliance with the National Environmental Policy Act (NEPA). The Rescission Act of 1995 (Public Law 104-19) requires each National Forest System unit to establish and adhere to a schedule for completing NEPA environmental analysis on all grazing allotments. There are some key areas on the allotments where soil condition and the amount and kind of vegetation present is not meeting desired conditions; as such, the purpose of this analysis is also to determine what changes in grazing management are needed to bring about improvement in those areas departed from desired conditions.

² 36 CFR 222.2 (c); Forest Service Manual 2203.1

2.2 Why Is There a Need for this Proposal?

There is a need to provide for management flexibility in order to address changing ecosystem conditions, site specific concerns, and desired resource conditions. There is also a need to utilize range improvements to improve livestock distribution, facilitate herd management, and address resource concerns.

There is a need for change in grazing management when existing resource conditions do not meet the desired resource conditions. Listed are the specific resource concerns for each of the allotments:

Smith Canyon: There are 7 main pastures (Cottonwood, Granites, Jones, Moano, Smith Canyon, Smith Mesa, and Spider) on the allotment and all were evaluated for soil and vegetation condition by the interdisciplinary team. The desired condition for vegetation is the maintenance of vegetation with mid- to high similarity to the site potential of the soil map unit, providing for ecological functionality and resiliency following disturbance while sustaining long-term productivity of the land. The desired soil condition is to be in satisfactory functioning condition or trending towards that state, providing for nutrient cycling, soil stability, and hydrologic functions. Desired conditions for vegetation is being met in all pasture key areas except the Smith Canyon Pasture TEUI 427. Soil desired condition is being met in the Cottonwood, Jones, Moano, and portions of the Granites and Spider pastures. The following is a list of areas that are not meeting desired conditions:

- **Smith Canyon Pasture:** Key soil map unit Terrestrial Ecosystem Unit Inventory (TEUI) 427, there is a low-similarity between existing perennial grass cover and composition as compared to what the soil and climate is capable of supporting. The soil condition is rated as unsatisfactory.
- **Granites Pasture:** Key soil map unit TEUI 461 is not meeting desired condition for soils and has a mixture of unsatisfactory and impaired soil condition. The other inventoried soil map unit, TEUI 477, was meeting desired condition for vegetation and soil.
- **Spider Pasture:** Key soil map unit TEUI 486 is not meeting desired condition for soils and displays a mixture of satisfactory and unsatisfactory soil condition. The other inventoried soil map unit, TEUI 462, was meeting desired condition for vegetation and soil.
- **Smith Mesa Pasture:** Key soil map unit TEUI 490 is not meeting desired condition for soils that display a mixture of impaired and unsatisfactory soil condition.

Williamson Valley: There are 11 main pastures (Burnt, Brushy, Camp Wood, Cottonwood, Humphreys, Little Pine, Lower Hitt, Stinson, Tailholt, Upper Hitt, and Whiskey) and all were evaluated for vegetation and soil condition on the allotment. Desired conditions for vegetation established by the interdisciplinary team are being met in 9 of the 11 pastures; the east part of Humphreys Pasture and the Little Pine Pasture need improvement. Soil is in satisfactory condition and meeting desired condition in the Lower Hitt, Upper Hitt, Stinson, Brushy, and Cottonwood Pastures. Soil condition is satisfactory in the west part of Humphreys Pasture and in TEUI 481 in the Tailholt Pasture. There is a mix of satisfactory and impaired soil condition in the Burnt Pasture. The following is a list of areas that are not meeting desired conditions:

- **Little Pine Pasture:** Key soil map unit TEUI 48 has impaired soil condition and the canopy cover and species diversity of perennial grasses is below the expected levels for the soil type. Plants also lack vigor.
- **Burnt Pasture:** Key soil map unit 48 has a mixture of satisfactory and impaired soil condition.
- **Whiskey Pasture:** Key soil map unit TEUI 48 has some areas rated in unsatisfactory soil condition, although vegetative groundcover where measured for the soil map unit is close to the potential levels.

- **Tailholt Pasture:** Key soil map unit TEUI 490 is rated in unsatisfactory soil condition.
- **Humphreys Pasture (East):** Key soil map units in the east part of the pasture are TEUIs 461, 462, 481, and 490 and these are in unsatisfactory soil condition because they lack perennial grass cover and species diversity.
- **Camp Wood Pasture:** Key soil map unit TEUI 542 is rated in impaired soil condition.

2.3 What Are We Proposing?

The proposed action is **Alternative 1**, consisting of the following:

Authorization

The Chino Valley District Ranger proposes to continue to authorize livestock grazing on the allotments under the following terms:

Smith Canyon Allotment: Authorize a range of livestock numbers from 200-275 head of cattle yearlong. The upper limit is equivalent to 3,300 Animal Unit Months (AUMs)³ of available forage use. The annual authorization will vary based on forage production, water availability, and resource conditions. Annual stocking could fall below the low end of the proposed stocking range. There are five large main pastures and two smaller pastures used in a rotational grazing system. Pasture rest and deferment will be scheduled to provide for achieving desired resource conditions.

Williamson Valley Allotment: Authorize a range of livestock numbers from 225-300 head of cattle yearlong. The upper limit is equivalent to 3,600 AUMs of available forage use. Annual stocking would be based on adaptive management, considering forage production, water availability, and resource conditions. Annual stocking could fall below the low end of the proposed stocking range. There are six larger pastures and five smaller pastures used in a rotational grazing system. Pasture rest and deferment will be scheduled to provide for achieving desired resource conditions.

The term grazing permits for these two individual allotments 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 proposal 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.

Under the adaptive management approach, regular/annual monitoring 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

³ 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.

Instructions and the Allotment Management Plan may be modified as appropriate to adapt management within the parameters of this proposal.

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

These modifications would be made through administrative decisions such as: the specific number of head stocked on the allotment seasonally; 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 allotments for an appropriate period of time, as conditions warrant. Such changes will not result in exceeding the AUMs authorized for livestock use that are developed through the analysis.

Resource Protection Measures

Resource protection measures will be incorporated into the project as design features to protect forest resources such as soil, 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 current year's forage production that is consumed or destroyed by animals. 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 (2000⁴, 2004⁵) 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 protection 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, as may be needed, on an annual basis. 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 1996). Examples of appropriate grazing intensity and forage use guidelines for areas of the allotments that are generally described to be in satisfactory condition include:

⁴ Holechek, J.L. and D. Galt. 2000. Grazing Intensity Guidelines. *Rangelands* 22 (3):11-14.

⁵ Holechek, J. and D. Galt. 2004. More on Stubble Height Guidelines. *Rangelands* 26 (4):3-7.

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

Site-specific Resource Protection Measures: Through the allotment analysis process undertaken by the interdisciplinary team, some issues have been identified where management adjustments and site specific design features were developed in order to attain desired resource conditions. Management objectives are specific, measurable, vegetation or soil parameters that can be quantified to determine whether progress is being made towards desired conditions.

Smith Canyon Allotment:

Smith Canyon Pasture: Key soil map unit Terrestrial Ecosystem Unit Inventory (TEUI) 427, there is a low-similarity between existing perennial grass cover and composition as compared to what the soil and climate is capable of supporting. The management objective is to improve the canopy cover and diversity of perennial grasses. The soil condition is rated as unsatisfactory. The management objective is to improve graminoid cover and the spatial distribution of vegetation to improve soil organic matter, soil stability, and to assist in improving compacted soils. Project design features include integrating rest to reduce soil compaction and controlling water access to improve pasture distribution. Prescribe incidental use levels (0-30%) to promote biomass retention and subsequent litter development. Also in this pasture, key soil map unit TEUI 461 is in impaired soil condition. The management objective for soils is to increase litter cover levels and decrease soil compaction. Design features include integrating seasonal deferment and/or rest and improving livestock distribution by controlling access to waters and herding.

Granites Pasture: Key soil map unit TEUI 461 is not meeting desired condition for soils and has a mixture of unsatisfactory and impaired soil condition. The management objective for TEUI 461 is to improve litter and graminoid cover and vegetation spatial distribution. Design features include deferred season of use to allow further graminoid biomass retention and control access to water facilities to improve distribution. An additional water source is proposed that would distribute cattle away from the area needing improvement.

Spider Pasture: Key soil map unit TEUI 486 is not meeting desired condition for soils and displays a mixture of satisfactory and unsatisfactory soil condition. The management objective for TEUI 486 is to improve grass and litter cover and vegetation spatial distribution within the mosaic openings in this soil type. There are areas within this soil type that are not producing enough forage to be considered in forage capacity calculations. Project design feature is to implement incidental use (0-30%) in the no capacity areas of TEUI 486.

Smith Mesa Pasture: Key soil map unit TEUI 490 is not meeting desired condition for soils that display a mixture of impaired and unsatisfactory soil condition. The management objective is to improve compacted soils and vegetation spatial gap distribution and maintain or improve graminoid cover and vegetative ground cover levels that are similar to enclosure reference conditions and TEUI potential. Project design features include the integration of rest to alleviate soil compaction and the use of management practices such as controlling water access and supplement locations to discourage concentrated use in TEUI 490 with incidental use levels prescribed as 0-30% until conditions improve. If these management options are not successful in improving soil condition, then a fencing option is proposed that would split the pasture and allow for more control of livestock access to areas needing improvement.

Williamson Valley:

Little Pine Pasture: Key soil map unit TEUI 48 has impaired soil condition and the canopy cover and species diversity of perennial grasses is below the expected levels for the soil type. Plants also lack vigor. The management objective is to improve perennial grass cover and litter, which will also serve to stabilize the soil and improve soil compaction. Project design features include light utilization levels (30% or less) and integrated rest periods to aid in establishing grasses and retaining optimal litter levels.

Burnt Pasture: Key soil map unit 48 has a mixture of satisfactory and impaired soil condition. The management objective is to maintain vegetation cover and enhance litter levels to alleviate compaction in the areas rated as impaired. Design feature is to integrate rest periods to allow freeze-thaw cycles to improve soil compaction in areas rated as impaired.

Whiskey Pasture: Key soil map unit TEUI 48 has some areas rated in unsatisfactory soil condition, although vegetative groundcover where measured for the soil map unit is close to the potential levels. Areas of poorer vegetative ground cover will be monitored to improve ground cover where possible by applying light use levels (30% or less).

Tailholt Pasture: Key soil map unit TEUI 490 is rated in unsatisfactory soil condition. The management objective is to improve perennial grass and litter cover to protect soil from erosion, and improve the spatial distribution of plants to prevent accelerated sheet erosion. Project design feature is to implement light use levels (30% or less) and provide additional water sources to draw livestock away from areas needing improvement.

Humphreys Pasture (East): Key soil map units in the east part of the pasture are TEUIs 461, 462, 481, and 490 and these are in unsatisfactory soil condition. The management objective is to not exacerbate soil damage through livestock use. Design feature is to avoid prescribed grazing use in the east part of the pasture and have only incidental grazing use (0-30%). No grazing capacity is assigned to this area of the pasture and no practices to draw livestock (water and supplement placement) would occur in the no grazing capacity areas.

Camp Wood Pasture: Key soil map unit TEUI 542 is rated in impaired soil condition. The management objective is to improve vegetation and litter cover to protect the soil from erosion, and improve the spatial distribution of plants to prevent accelerated sheet erosion. Project design features include integrating rest or deferment during the growing season to encourage grass plant establishment and litter development that can alleviate soil compaction.

Once desired conditions for vegetation or soil are being met in areas needing improvement, then the allotment-wide utilization standards could be applied.

Additional resource protection measures may be implemented. These 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 enclosures, water pipelines, storage and troughs; reconstruction of non-functional improvements and construction of new improvements such as spring boxes, drift fences, and water gaps.

Structural Range Improvements

This alternative includes construction of the following new structural improvements that have been developed to address resource concerns or improve grazing management. 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, or seasonal use periods may be shortened. Different types of water developments may be employed depending on the location.

Smith Canyon:

Because of limited road access for large vehicles like well-drilling rigs, the proposed water developments on the Smith Canyon Allotment would likely be trick tanks (catchment apron that

directs rainfall into a storage tank and pipeline system with troughs), or earthen stock tanks (dug out areas that collect rainfall directed from shallow ditches).

- Construct 3 reliable water developments in Smith Canyon Pasture: one north of Sheridan Lake in the north half of section 21; one on the south benches in NE quarter of section 35; one in north half of section 6. Two of these (section 21 and 35) are to replace existing earthen stock tanks that are non-functional and replace with trick tanks.
- Five additional water developments in the following locations: Cottonwood Pasture SW quarter of section 31; Granites Pasture north half section 4; Moano Pasture west half of section 22 (replace non-functional earthen stock tank); Spider Pasture NE quarter of section 32; Jones Pasture NW quarter of section 33.
- Construct drift fences to better control livestock distribution: one in Smith Canyon Pasture near Sycamore Spring; one in Smith Mesa Pasture along the trail west of Horseshoe Tank; and one in the Granites Pasture along the trail north of Saddle Tank.
- Construct fences (water lots) around Alkaline Tank and Dyke Pond in the Smith Canyon Pasture to better control livestock use patterns in the pasture.
- Construct an east-west fence to split Smith Mesa Pasture into Mesa and Rincon Pastures if controlling access to water does not sufficiently improve distribution and result in achieving desired resource conditions.
- Expand the existing fencing at Alkaline Spring to include protection for the spring area.

Williamson Valley:

Different types of water developments may be employed depending on the location, and could include trick tanks with a pipeline to water troughs, earthen stock tanks, or wells.

- Construct 12 additional water sources in the following locations: Upper Hitt Pasture, section 15 (likely a trick tank), and SE quarter of section 16 on the pasture division fence; Tailholt Pasture, SE quarter of section 22; Lower Hitt Pasture, SW quarter of section 25; shared water source between Burnt and Upper Hitt Pastures in NW quarter of section 26; Burnt Pasture south half of section 27; shared water source for Whiskey and Brushy Pastures in SW quarter of section 33; Brushy Pasture NW quarter of section 36; Stinson Pasture SE quarter of section 17, SW quarter of section 29, SW quarter of section 31; Camp Wood pasture north half of section 33.
- Convert 3 existing earthen stock tanks to trick tanks in order to provide more reliable water supplies: Cottonwood Pasture, Section 23 Tank, Coldwater Tank Tailholt Pasture, tank in SW quarter of section 10.
- Construct a new holding pasture south of Spades Tank in the Tailholt Pasture.

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

Monitoring

In order to evaluate whether grazing management is making progress towards meeting desired resource conditions, two types of monitoring would be conducted:

1. Implementation monitoring would be conducted by the Forest Service, and may include, but is not limited to the following: livestock actual use data, compliance with pasture rotation schedules, grazing intensity evaluations during the growing season (within key and critical areas), utilization at the end of the growing season (within key areas), and visual observation of vegetation and ground cover.
2. Effectiveness monitoring to evaluate the success of management in achieving the desired objectives would occur within key areas at an interval of ten (10) years or less. Effectiveness monitoring may also be conducted if data and observations from implementation monitoring (annual monitoring) indicate a need. This type of monitoring can include species composition, plant cover, frequency or density and/or vegetative ground cover monitored at key areas and at areas identified with site-specific resource concerns. Both qualitative and quantitative monitoring methods can be used.

2.4 What Other Alternatives Are Being Considered?

Alternative 2 is the No Action/No Grazing Alternative⁶ required by Forest Service policy⁶.

Authorization: Under this alternative, livestock grazing would not be authorized.

Cancellation of the Grazing Permit: Livestock grazing on the Smith Canyon and Williamson Valley Allotments would be discontinued and the Term Grazing permits would be cancelled after a 2-year notification to the permit holders (FSM 2231.62d/FSH 2209.13-16.24). The cancellation of the term permit under this alternative does not represent an official administrative closing of the allotments; rather it would represent the suspension of grazing on these allotments for an undetermined amount of time, until or unless a different decision is made.

Structural Range Improvements: Under this alternative, no new range improvements would be constructed on the allotments.

Maintenance of Existing Range Improvements: Under this alternative, maintenance of range improvements normally assigned to the permit holder would no longer occur. 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.

⁶ FSH 2209.13, Chapter 90, Section 92.31

Monitoring: The Forest Service would conduct periodic monitoring to verify that no cattle are present on the allotments once the permits are cancelled.

2.5 Who Will Make the Decision and What Will be Considered?

The Chino Valley 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, public input, and other considerations, whether to continue livestock grazing on the Smith Canyon and Williamson Valley Allotments; if so, under what conditions; and whether new improvements including water developments and fencing will be implemented. 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 purpose and need outlined earlier sets the scope of the project and analysis to be completed to help the responsible official make a decision. In making the decision, the responsible official will consider how well the alternatives lead to improving resource conditions affected by livestock grazing.

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.

2.6 How Long is the Decision Valid?

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, 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.

Table 1: Comparison of Alternatives and Effects for Smith Canyon and Williamson Valley Allotments

	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
Authorization (AUMs, Season of Use & Term)	Smith Canyon: Yearlong grazing by between 200-275 adult cattle in a typical year, less under drought conditions; Williamson Valley: Yearlong grazing by between 225-300 adult cattle in a typical year, less during drought conditions.	No cattle authorized
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 grazing season, and up to 50- 60% browse use on key upland woody species; Incidental or light use from 0-30% in areas needing improvement along with rest and deferment.	N/A
New Improvements	Provide up to 6 new water developments on the Smith Canyon Allotment and make 2 existing sources more reliable; construct drift fences, water lots, or further pasture division	No new range developments constructed.

	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
	fences. Provide up to 12 new water sources on the Williamson Valley Allotment and make 3 existing sources more reliable; construct a new holding pasture.	
Maintenance of Improvements	Existing necessary improvements listed on the term grazing permit are maintained to standards by grazing permittee; new improvements will increase maintenance responsibility.	Maintenance of range improvements discontinued except for maintaining allotment boundary fences by adjacent permittees. Without a permittee, maintenance responsibility will default to the Forest Service for any infrastructure deemed essential.
Monitoring	Short and long-term monitoring of implementation and effectiveness of adaptive management during term of permit	Monitoring of non-use compliance.
Upland Vegetation Effects	Growing season rest or deferment provided in all pastures through grazing rotation strategy; allowable use levels will lead to 55-65% of biomass being retained on site after grazing to improve litter cover, soil protection, and water infiltration. In areas needing vegetation improvement, 70% or more vegetative biomass retained. Improvement in vegetative cover and plant vigor expected	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 cover. Those areas with extensive juniper and shrub cover are stable and would show little difference from alternative 1. Slightly quicker improvement in vegetative cover in

	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
	given adequate precipitation. Areas of thick tree or brush cover will remain static.	open areas since only incidental wildlife use would occur.
Watershed/Soil Effects	Soils in less than satisfactory condition would improve within their ecological capability through the application of resource protection measures designed to improve vegetation condition. Implementation of allowable use levels allows for 55-65% of biomass to be retained on site, and areas needing improvement would retain over 70% of biomass on site. Retention of biomass would allow organic matter to be incorporated into the soil for nutrient cycling and protection from accelerated soil loss. Integrating rest allows freeze-thaw cycles to break up soil compaction.	Soils in less than satisfactory condition would improve within their ecological capability. More biomass is retained on site every year than under 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. In areas where unsatisfactory soil condition is occurring due to dense juniper canopy and lack of herbaceous cover, there would be minimal change by removing livestock.
Wildlife/Rare Plant/Aquatic Species Effects	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 or their designated Critical Habitats. Upland areas will improve towards	Would provide more rapid movement toward desired habitat conditions. Important water sources that are currently maintained by the permittee would need to be maintained by other partners or the Forest Service. There would be no benefits to wildlife

	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
	desired conditions by implementing use guidelines. Competition for palatable browse species could occur during the fall and winter months. Some impacts on Management Indicator Species (MIS) habitat, but no effect to trend of MIS species forest-wide. Regional Forester sensitive species may occur or have habitat in the project area. Project actions may impact individuals or habitat of these species, but there would not be a trend toward Federal listing. Additional water developments improve wildlife habitat quality.	habitat from additional proposed water sources. Any potential impacts to Forest Service sensitive species and MIS from the presence of livestock will no longer occur.
Archeological Effects	No adverse effects on heritage resources. Avoidance of impacts to cultural resources during construction of new range improvements.	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.

3. What Are the Existing Resource Conditions and How Will the Proposal Affect these Resources?

A summary of the existing resource conditions and environmental effects of the alternatives is provided in this chapter. Each resource specialist has considered the direct, indirect, and cumulative effects that would be expected to occur from implementation of the alternatives addressed in this EA. They have 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.

3.1 What Has Already Occurred in the Project Area?

Resource specialists reviewed the past, present, and reasonably foreseeable future activities to determine if the effects of the proposed activities, when added to the effects of other actions, would increase impacts to a level of significance. The resource specialists' reports, included in the project record, contain details of these considerations.

The following table summarizes the past, present, and future activities within the Smith Canyon and Williamson Valley Allotments. For some resource areas, the primary 6th level subwatersheds that contain portions of the allotment were considered for the cumulative effects analysis, and for others the area of consideration is limited to the allotments themselves. The primary 6th code subwatersheds that contain the project area are: Cottonwood Canyon, Smith Canyon, Hitt Wash, Horse Wash, Humphrey Wash, Strickland Wash, and Upper Williamson Valley Wash. The following watershed have a minute portion within the project area and were not analyzed in the cumulative effects: Loco Creek, Long Canyon, Mud Tank Wash, Upper Boulder Creek, Upper Sycamore Creek, and Weed Canyon. In addition, Stringtown Wash-Pine Creek sub-watershed was not analyzed because the shape of the watershed within the project area is not indicative of effects associated with this project. The map in Appendix 3 illustrate the 6th level subwatersheds in relation to the project area.

Table 2: Past, Present, and Future Activities in the 6th Code Subwatersheds Containing the Allotments

Type of Activity	Past Activities/Events	Present Activities	Future Activities
Wildfire Suppression	For the last 10 years there have been no large fires reported within the subwatersheds containing the allotments	none	unknown
Veg Treatment Projects / Non-Structural Range Improvements / Rx Burns	During the past 10 years there has been about 800 acres of juniper thinning on the Smith Canyon Allotment. Prescribed burning more common in the 1980s.	No prescribed burning has occurred since about 2009 on the allotments. Effects of past prescribed burning in chaparral is no longer evident.	Chino Landscape Project – juniper thinning and prescribed burning will occur in the next 10 years

Type of Activity	Past Activities/Events	Present Activities	Future Activities
Livestock Grazing	Project area has been grazed by domestic livestock since the late 1800s. Stocking levels were not in balance with forage supplies historically, resulting in some areas of overgrazing historically.	For the project area there will be managed grazing with stocking in balance with forage supplies; 6 th level watersheds contain portions of several other allotments that are managed for proper stocking levels; allotments are managed with approved Allotment Management Plans or through annual instructions.	Stocking levels determined through adaptive management and in balance with annual forage supplies.
Recreational Activities & Fuelwood Cutting	Motorized and non-motorized trails; dispersed recreation (primarily OHV use, target shooting, hunting)	There are 19 trails in the Williamson Valley Allotment. Smith Canyon allotment has 8 trails in it. All these trails are designated for motorized use. The trails have not been maintained for several years and are in very poor condition.	No anticipated change; no new trails planned
Roads, Utility ROWs, Land Development and Land Exchanges	Roads developed on National Forest land within the 6 th level HUCs containing the project area to access private lands, and forest resources; utility corridors developed to private land inholdings	Road route density is within the range of 1 to 2.4 miles per square mile. Poor condition for road and trail maintenance since BMPs for the maintenance of designed drainage features are applied to less than 50% of the roads, trails, and water crossings in the watersheds.	No new roads or facilities planned; no land exchanges anticipated

3.2 What are the Impacts to Rangeland Vegetation?

Existing Condition:

For the purpose of these analyses, it is not practical to individually analyze each soil map unit occurring within an allotment or project area. To facilitate a meaningful analysis, representative Terrestrial Ecosystem Unit Inventory (TEUI) map units were selected in each pasture within the allotment. The location of these representative soil map units is displayed in Appendix 2. The areas selected for analysis are based on the key area concept; “a relatively small portion of a range selected because of its location, use or grazing value as a monitoring point for grazing use. It is assumed that key areas, if properly selected, will reflect the overall acceptability of current grazing management over the range” (SRM 1998).

For this project, the ID team defined the desired condition for vegetation as: 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. Mid to high similarity is defined as more than 34% similar to the potential plant community. Since cattle prefer to consume grasses over shrubs, when present, the similarity of the perennial grass component was the main factor in determining whether desired conditions were being met. The DVS is the species composition and cover for the potential plant community, or ecological type (ET), as shown in the *Terrestrial Ecosystem*

Survey of the Prescott National Forest (USDA 2000) and the associated *Ecological Classification of the Prescott National Forest* (USDA 2006 draft) for the key soil types found on the allotments. However, in some cases the ET perennial grass indicator species may not have been present in the site sampled, but if desirable perennial grasses were present instead with canopy cover similar to ET average cover, then DVS was being met by existing conditions. In addition, the Forest Plan desired condition for vegetation (DC-Veg-3) states: "Vegetation on lands deemed suitable for livestock grazing provides sustainable amounts of forage consistent with multiple-use objectives. Herbivory aids in sustaining or improving native vegetation cover and composition. Livestock grazing contributes to aspects of the social, economic, and cultural structure and stability of rural communities."

Rangeland Management Status (RMS) can be described by combining Desired Vegetation Status (DVS) with trend determinations. For example, a plant community with mid to high similarity to the plant species composition and cover of the DVS that has a downward trend would be considered to have an unsatisfactory RMS since the downward trend indicates the area is moving away from desired conditions. Range condition trend was determined by examining past vegetation inventory records for changes in key forage species abundance and species composition. Past vegetation inventory was most often accomplished by the Parker Three Step Method, whereby the plant species mix at a site was rated as to the desirability for cattle consumption. This method did not consider the site potential for vegetation based on soil, climate, and topography. Current methods do consider site potential and are considered to be more valid for determining the health of the vegetative community. The historic Parker Three Step data, including repeat photography, does offer a perspective on the changes that have occurred through the years at a particular site.

Smith Canyon Allotment

There were 7 TEUI map units chosen as key areas to evaluate vegetation ecological status in 7 pastures. Some of the larger pastures or those with more variable vegetation had more than one key area inventoried. These map units were selected based on their accessibility to livestock, in other words, they are found on flat to gently sloping areas. The table below displays the potential natural vegetation types on the allotment with key area soil map units highlighted that served as sampling locations.

Table 3: Smith Canyon Allotment Potential Natural Vegetation Types (PNVT)

PNVT	TEUI included Within	Acreage	Percent of Allotment
Piñon-Juniper Evergreen Shrub	30, 432, 434, 461, 462, 464, 477, 479, 481, 485, 486, 491	28,285	60
Juniper Grassland	427, 428, 490	5,742	12
Interior Chaparral	47, 425, 436, 448, 475, 476, 483, 551	12,451	26
Colorado Plateau Grassland	45	17	<1
Riparian Gallery Forest	41, 48, 50	459	<1
Ponderosa Pine-Evergreen Oak	505, 563	76	<1
Ponderosa Pine-Gambel Oak	55	80	<1

The following key areas served as locations for data collection for vegetation and soil condition.

TEUI 425, Cottonwood Pasture

TES Map Unit:	425	Acres in Pasture:	866
		% of Pasture:	14



Photo 1 above: Key TEUI map unit in Cottonwood Pasture with chaparral vegetation, TEUI 425, September 2015

The key map unit in the Cottonwood Pasture, TEUI 425, is chaparral shrubs on hills and elevated plains with gentle to moderate slopes (0-40%) across the northwestern and central portion of the pasture. The vegetation for this map unit fits within the Interior Chaparral PNVT. Soils are shallow and very stony or very cobbly. Texture is course sandy loam. The site average is variable among the community types for tree shrub and graminoid cover. Tree cover ranges from 10-20%, mostly comprised of Juniper. Shrub cover ranges from 32-68% cover primarily consisting of turbinella oak. Perennial grass cover will vary depending on shrub and tree cover, having 15% cover from indicator species threeawn, sideoats grama, blue grama, squirreltail, and muttongrass.

The data to describe existing vegetation was collected September 2015. The growing season in 2015 had about average precipitation and grasses were in good and excellent vigor at the time of sampling. Sampling occurred prior to annual grazing. Grass cover was 18%; just above the total graminoid cover mean of 15% for the potential plant community. Diversity of grasses and shrubs are within what is expected for the PNVT. Desired vegetation conditions are being met.

TEUI 427, Smith Canyon Pasture

TES Map Unit:	427	Acres in Pasture:	255
		% of Pasture:	2



Photo 2 above: Key TEUI 427 map unit in Smith Canyon Pasture with woodland/grassland vegetation, October 2015

A key map unit in the Smith Canyon Pasture, TEUI 427, is piñon-juniper grasslands found on lowland and elevated plains with gentle to moderate slopes (0-24%) located in the west central portion of this pasture. The vegetation for this map unit fits within the Juniper Grassland PNVT. Soils are deep, very stony, silty clay loam with high shrink/swell properties. The site average is variable among the community types for tree shrub and graminoid cover. Tree cover ranges from 1-7% comprised of juniper, shrub cover ranges from 12-27% cover primarily consisting of shrubby buckwheat. Perennial grass cover will vary depending on shrub and tree cover, having 41% average cover dominated by tobosagrass at 30% with sideoats grama and curly mesquite making up less than 5% each.

The data to describe existing vegetation was collected October 2015. This site, like others visited, seemed to have received little to no precipitation and grasses were in poor vigor at the time of sampling. Sampling occurred soon after grazing. Utilization on tobosagrass was measured at 42% use by weight. Grass cover was 5%, 8 times less than total graminoid cover mean for the PNVT. The site selected is a historic sampling site for TEUI 427. Diversity of grass on this site is well below expected when compared to the ecological classification guide. Only two grass species were found on site while it should average seven. Due to grazing of this site prior to our data collection, it may be unfair to compare the canopy cover recorded with the Ecological Type average. The majority of above ground weight is near the bottom of graminoid

plants so 42% removal of weight removes a considerable amount of canopy, well over 50%. This key area was not meeting desired conditions for vegetation.

TEUI 461, Smith Canyon Pasture

TES Map Unit:	461	Acres in Pasture:	1,860
		% of Pasture:	13

A key map unit in the Smith Canyon Pasture, TEUI 461, are piñon-juniper woodlands found on elevated plains with gentle slopes (averaging 4%) located in the west central portion of this pasture. The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNVT. Soils are shallow to moderately deep, extremely cobbly to extremely stony, clay loam or sandy clay loam with high shrink/swell properties. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 21-36% comprised of juniper; shrub cover ranges from 9-20% cover primarily consisting of turbinella oak. Perennial grass cover will vary depending on shrub and tree cover, having 16% average cover made up of sideoats grama and hairy grama.

The data to describe existing vegetation was collected October 2015. This site, like others visited seemed to have received little to no precipitation and grasses were in fair vigor at the time of sampling. Sampling occurred soon after cattle were removed from this pasture. Utilization on curly mesquite was measured at 7% use by weight. Total perennial grass cover was 41%, 3 times more than the total grass cover average for the ecological type. Curly mesquite makes up 38% of the grass cover on site, the remainder was sideoats and blue grama. The potential plant community would have 9 different species of grass while there are currently 3 species at this location. Desired conditions for vegetation are being met due to the favorable amount of grass cover, but the site would be managed adaptively to improve species diversity.

TEUI 461, Granites Pasture

TES Map Unit:	461	Acres in Pasture:	401
		% of Pasture:	9

The key map unit in the Granites Pasture, TEUI 461, are piñon-juniper woodlands and are further described above. The data to describe existing vegetation was collected August 2015. The growing season in 2015 had about average precipitation and grasses were in good vigor at the time of sampling. Sampling occurred prior to grazing, and had been rested for nearly 1 year. Total perennial grass cover was 10%, which is 6% lower than total graminoid cover mean of the ecological type (ET). Diversity of grasses is low with 4 species on site and 9 described in ET. Desired conditions for vegetation are being met due to the mid-similarity of the total grass cover, but the site would be managed adaptively to improve species diversity where possible.



Photo 3 above: Key TEUI map unit in Granites Pasture, TEUI 461, August 2015, representing a piñon-juniper evergreen shrub PNVT

TEUI 477, Granites Pasture

TES Map Unit:	477	Acres in Pasture:	2,104
		% of Pasture:	45

A key map unit in the Granites Pasture, TEUI 477, are piñon-juniper woodlands found on hills with gentle to steep slopes (0-40%) and make up the majority of usable acres in this pasture. The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNVT. Soils are shallow, extremely bouldery, loamy coarse sand. Soils developed in granite and rock outcroppings are common. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 1-29% comprised of Juniper and piñon pine, shrub cover ranges from 29-51% cover primarily consisting of turbinella oak. Perennial grass cover will vary depending on shrub and tree cover and ranges from 4-13%.

The data to describe existing vegetation was collected September 2015. The growing season in 2015 had about average precipitation and grasses were in good vigor at the time of sampling. Sampling occurred prior to grazing. Total perennial grass cover was 8%, which is 5% less than ET total graminoid cover average. There were 8 grass species found on the site as compared to 13 for the ecological type. Desired conditions for vegetation are being met at this key area.

TEUI 462, Spider Pasture

TES Map Unit:	462	Acres in Pasture:	988
		% of Pasture:	14

A key map unit in the Spider Pasture, TEUI 462, is piñon-juniper woodlands found on hills with gentle to steep slopes (1-56%) and make up the majority of usable acres surrounding Lefthand and Toohey tanks in this pasture. The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNVT. Soils range from shallow to moderately deep, extremely stony or extremely cobbly, sandy clay loam. Soils developed in basalt or schist material. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 5-29% comprised of juniper and piñon pine, shrub cover ranges from 16-42% cover primarily consisting of turbinella oak. Perennial grass cover will vary depending on shrub and tree cover and ranges from 4-30%.

The data to describe existing vegetation was collected September 2015. The growing season in 2015 had about average precipitation and grasses were in good vigor at the time of sampling. Grass cover was 19%, slightly above ET average of 17%. Six grass species were on site compared to 7 described for the ET. This area was part of a prescribed fire in 1988. It has responded well with browse in good vigor. Desired conditions for vegetation are being met at this key area.

TEUI 486, Spider Pasture

TES Map Unit:	486	Acres in Pasture:	2,545
		% of Pasture:	36

A key map unit in the Spider Pasture, TEUI 486, is piñon-juniper woodlands on elevated and lowland plains on surrounding Jones Mountain with gentle slopes averaging 5% (0-15%). The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNVT. Soils are shallow to deep, gravelly to very gravelly. Texture is coarse sandy loam or loamy coarse sand from granitic parent material. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 13-28% comprised of juniper, Emory oak, and piñon pine, shrub cover ranges from 27-50% cover primarily consisting of turbinella oak. Perennial grass cover will vary depending on shrub and tree cover and ranges from 3-21%.

The data to describe existing vegetation was collected August 2015. This area appears to have not received much rainfall. Grasses were in fair to poor vigor at the time of sampling. Nearby Dillon tank was dry. Total grass cover on site was 7%, which is about half of ET average of 16%. Shrub cover was comparable and tree cover was below the ET average. Diversity of grasses is low with two species compared to 5 described for the ET. Desired conditions for vegetation are being met, primarily because the ecological type is more shrub than grass dominated.

TEUI 486, Moano Pasture

TES Map Unit:	486	Acres in Pasture:	370
		% of Pasture:	18



Photo 4 above: Key TEUI map unit in Moano Pasture, TEUI 486, August 2015

This key map unit TEUI 486 is piñon-juniper woodlands on elevated and lowland plains as described above for the Spider Pasture. The data to describe existing vegetation was collected August 2015. The growing season in 2015 had about average precipitation. There were several horses in this pasture at the time of sampling, however little utilization was seen. Grasses were in fair to excellent vigor at the time of sampling. Grass cover is double and shrub and tree cover were far below that described for the ET Five grass species are on site compared to the ET average of 8. Desired conditions for vegetation are being met in this key area of the Moano Pasture.

TEUI 486, Jones Pasture

TES Map Unit:	486	Acres in Pasture:	588
		% of Pasture:	34

A key map unit in the Jones Pasture, TEUI 486, is as described above. The ID team performed an ocular comparison of this location to the classification guide and matched it with ET late successional state, or potential natural community. The growing season in 2015 had about average precipitation. This site is just north and east of the line of poor precipitation. Desired conditions for vegetation are being met at this location.

TEUI 490, Smith Mesa Pasture

TES Map Unit:	490	Acres in Pasture:	4,730
		% of Pasture:	54

A key map unit in the Smith Mesa Pasture, TEUI 490, is a juniper woodland common on Smith and Tailholt Mesas. Slopes average 5% (0-15%). The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNV. Soils are deep, very stony, silt loam with shrink/swell properties. Soils developed on basalt parent material are extremely cobbly to extremely stoney, clay loam or sandy clay loam with high shrink/swell properties. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 10-35% comprised of juniper, shrub cover ranges from 4-19% cover primarily consisting of broom snakeweed. Perennial grass cover will vary depending on shrub and tree cover ranging from 5-39% dominated by blue grama.

The data to describe existing vegetation was collected September 2015. The growing season in 2015 had about average precipitation but this particular location looked to have not received as much rain as other areas to the east and north. Grasses were in good and fair vigor at the time of sampling. Cattle were moving into this pasture and use on new growth of sideoats grama was at 33% by weight. Total perennial grass cover was 24%, no different than ET total graminoid cover mean. Eight species of grass were on site compared to 5 for the ET. Desired condition for vegetation is being met at this key area.

Table 4: Summary of Desired Vegetation Status and Rangeland Management Status by Pasture on the Smith Mesa Allotment

Pasture	TEUI Map Unit	Desired Vegetation Status	Trend	Rangeland Management Status
Cottonwood	425	Mid similarity for grasses	Stable	Satisfactory
Smith Canyon	427	Low similarity for grasses	Stable	Unsatisfactory
	461	Mid similarity for grasses	Stable	Satisfactory
Granites	461	Mid similarity for grasses	Stable	Satisfactory
	477	Mid similarity for grasses	Stable	Satisfactory
Spider	462	Mid Similarity for grasses	Stable	Satisfactory
	486	Mid Similarity for grasses	Stable	Satisfactory
Moano	486	Mid similarity for grasses	Stable	Satisfactory
Jones	486	Mid similarity for grasses	Stable	Satisfactory
Smith Mesa	490	Mid Similarity for grasses	Stable	Satisfactory

Williamson Valley Allotment

There were 9 TEUI map units chosen as key areas to evaluate vegetation and soil condition in eleven pastures. These map units were selected based on their accessibility to livestock, in other words, they are found on flat to gently sloping areas. Some larger pastures or those with variable vegetation types have more than one key area. The table below displays the potential natural vegetation types on the allotment with key area soil map units highlighted that served as sampling locations.

Table 5: Potential Natural Vegetation Types on the Williamson Valley Allotment

PNVT	TEUI included Within	Acreage	Percent of Allotment
Piñon-Juniper Evergreen Shrub	43, 430, 434, 461, 462, 477, 479, 481, 485, 486, 491, 499	29,410	60
Juniper Grassland	407, 490	2,041	4
Interior Chaparral	425, 436, 443, 448, 450, 453, 468, 475, 476, 551	10,431	21
Great Basin Grassland	45	11	0
Riparian Gallery Forest	40, 41, 48	818	2
Ponderosa Pine-Evergreen Oak	505, 530, 542, 544, 563	5,804	12
Ponderosa Pine-Gambel Oak	55, 540	339	<1

TEUI 48, Burnt Pasture

TES Map Unit:	48	Acres in Pasture:	187
		% of Pasture:	11



Photo 5 above: Key TEUI map unit in Burnt Pasture, TEUI 48, September 2015

The critical map unit in the Burnt Pasture, TEUI 48, is found on intermittent drainages on valley plains. The vegetation for this map unit fits within the Riparian Gallery Forest PNVT. Slopes are gentle, averaging 2%. Soils are deep, sand or sandy loam and developed in mixed alluvium. Ecological Type 1 (ET1) is farther from the channel and rarely flooded, and this ecological type

is where key area sampling occurred. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 8-36% mostly comprised of Arizona walnut, shrub cover ranges from 1-4% cover primarily consisting of shrubby buckwheat. Perennial grass cover will vary depending on shrub and tree cover, having up to 30% cover from indicator species blue grama, alkali sacaton, and sand dropseed.

The data to describe existing vegetation was collected September 2015. The growing season in 2015 had about average precipitation and grasses were in excellent vigor at the time of sampling. Sampling occurred prior to annual grazing. Total grass cover was 31% just below ET1 total graminoid cover mean of 35%. Diversity of grasses and shrubs are in line with expected numbers of species for ET1. Eight perennial grass species were found on site compared to ET1 maximum of 7. Even though this site is 24% similar to ET1 (low similarity), due to different grass species than ET1 description, the amounts of perennial grass cover and high number of species performs the same ecological function as the species listed in the ET description. Sideoats grama was recorded at 19% cover on site, but not listed as a key species for ET1. This is a desirable grass species that is common in this location. This key area is considered to be meeting vegetation desired condition because of the good canopy cover and diversity of desirable grasses.

TEUI 48, Little Pine Pasture

TES Map Unit:	48	Acres in Pasture:	108
		% of Pasture:	19

A critical map unit in the Little Pine Pasture, TEUI 48, is found on terraces along intermittent drainages on valley plains. The data to describe existing vegetation was collected September 2015. Sampling occurred prior to annual grazing; however several horses were in the pasture and had been for a few weeks. Utilization as estimated at 5%. Total grass cover was 16% about half of ET1 total graminoid cover and rating a low similarity to the ET (29%). Diversity of grasses is a little below the average with 5 perennial grass species sampled and 7 described for ET1. The grasses seem stunted. There is little vegetative ground cover and there is sheet and rill erosion occurring. This site is on the edge of uplands. Desired condition for vegetation is not being met in this key area.

TEUI 48, Lower Hitt Pasture

TES Map Unit:	48	Acres in Pasture:	58
		% of Pasture:	4

The data to describe existing vegetation was collected September 2015. The growing season in 2015 had about average precipitation and grasses were in excellent to good vigor at the time of sampling. Sampling occurred prior to grazing. Total grass cover was 21%, about two thirds of ET1 total graminoid cover mean. Diversity of grasses is a little below the average as described for ET1. Five perennial grass species were found on site, ET1 maximum is 7.

Even though this site is 22% similar to ET1 (low similarity), due to different grass species than ET1 description, the amounts of perennial grass cover and high number of species performs the same ecological function as the species listed in the ET description. This key area is meeting desired condition for vegetation.

TEUI 48, Whiskey Pasture

TES Map Unit:	48	Acres in Pasture:	82
		% of Pasture:	10

The data to describe existing vegetation was collected September 2015. The growing season in 2015 had about average precipitation and grasses were in excellent vigor at the time of sampling. Sampling occurred prior to grazing. Total grass cover was 44% about 9% more than ET1 total graminoid cover mean. The site selected is critical for this pasture as it may receive concentrated use due to availability of surface water. Diversity of grasses is the same as the average as described for ET1. This key area is meeting desired condition for vegetation.

TEUI 434, Upper Hitt Pasture

TES Map Unit:	434	Acres in Pasture:	1,247
		% of Pasture:	53



Photo 6 above: Key TEUI map unit in Upper Hitt Pasture, TEUI 434, September 2015

A key map unit in the Upper Hitt Pasture, TEUI 434, is piñon-juniper woodlands on hills and elevated plains. Slopes are moderate to steep and range from 0-40%. The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNV. Soils are developed in mixed alluvium and are deep, very gravelly to very cobbly, with a sandy loam or coarse sandy loam texture. The site average is variable among the community types for shrub and graminoid cover. Shrub cover ranges from 3-25% cover primarily consisting of turbinella oak. Perennial grass cover will vary depending on shrub and tree cover, having 17% average cover made up of sideoats grama, blue grama, and squirreltail.

The data to describe existing vegetation was collected September 2015. The vigor of grasses was good. Sampling occurred prior to cattle grazing for the year. Total perennial grass cover was 18%, slightly above the ET values. Diversity of grasses on site is good with 5 species present, only one less than the ET. Shrub cover of 47% is double that for the ET, but existing tree cover is 18%, about half that expected for the ET. Desired condition for vegetation is being met at this pasture key area.

TEUI 448, Stinson Pasture

TES Map Unit:	448	Acres in Pasture:	463
		% of Pasture:	34



Photo 7 above: Key TEUI map unit in Stinson Pasture, TEUI 448, August 2015

A key map unit in the Stinson Pasture, TEUI 448, is chaparral found on hills. Slopes range from 0-40%. The vegetation for this map unit fits within the Interior Chaparral PNVT. Soils are generally very shallow or shallow, very gravely or very cobbly. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 0-13%, shrub cover ranges from 52-81% cover primarily consisting of turbinella oak and mountain mahogany. Perennial grass cover will vary depending on shrub and tree cover, having 9% average cover made up of sideoats grama, blue grama, junegrass, and mutton grass.

The data to describe existing vegetation was collected late August 2015. The vigor of grasses was fair (blue grama), good (hairy grama), and excellent (plains lovegrass). Sampling occurred prior to cattle grazing for the year. Total perennial grass cover was 43%, more than 4 times that of the ET average. Warm season grasses make up 31% of grasses and cool season make up

12%. The ET describes 6 different species of grass in this soil type. Sampling revealed higher diversity of grasses on site with 8 species. Site description suggests a 50-50 composition of cool and warm season grasses, however total grass cover at this site far exceeds expected cover. Desired conditions for vegetation are being achieved at this key area.

TEUI 461, Humphreys Pasture

TES Map Unit:	461	Acres in Pasture:	492
OCULAR ESTIMATE		% of Pasture:	10

A key map unit in the Humphreys Pasture, TEUI 461, are piñon-juniper woodlands found on elevated plains with gentle slopes (averaging 4%) located in the central portion of this pasture surrounding Humphrey Tank. The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNV. Soils are shallow to moderately deep, extremely cobbly to extremely stony, clay loam or sandy clay loam with high shrink/swell properties. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 21-36% comprised of juniper, shrub cover ranges from 9-20% cover primarily consisting of turbinella oak. Perennial grass cover will vary depending on shrub and tree cover, having 8% average cover made up of the grama grasses.

The ocular assessment occurred September 2015. Grasses on site were rated in poor vigor. This particular location looked to have not received as much rain as other areas to the east and north. It was decided it was not worth sampling due to lack of herbaceous vegetation. It was noted that heavy use was occurring on existing shrubs. This key area is not meeting desired condition for vegetation.

TEUI 475, Stinson Pasture

TES Map Unit:	475	Acres in Pasture:	1,172
OCULAR ASSESSMENT		% of Pasture:	4

A key map unit in the Stinson Pasture, TEUI 475, is an extensive chaparral map unit found on hills and mountains with moderate to steep slopes (15-120%) averaging 41%. The vegetation for this map unit fits within the Interior Chaparral PNV. Soils are very shallow to shallow, very stony, sandy loam to coarse sandy loam. Soils developed in granite, and rock outcroppings are common. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 0-5% comprised of Juniper and piñon pine, shrub cover ranges from 28-65% cover primarily consisting of turbinella oak. Perennial grass cover will vary depending on shrub and tree cover ranges from 4-36%.

The site was visited in September 2015. The growing season in 2015 had about average precipitation and blue grama vigor rated excellent. Condition of browse was good with historic use noted. Mountain mahogany and turbinella oak showed light to moderate use while skunkbush use was light. Vegetation canopy cover was estimated by the ocular method. Total perennial grass cover was estimated at 2%, less than the ET graminoid cover average of 10%. Shrub cover was high at 74% above the ET average of 60%, dominated by turbinella oak (40%) and manzanita (25%). This site was determined to be meeting desired conditions for vegetation on a chaparral site that is characterized by high shrub cover and sparse grass cover.

TEUI 477, Brushy Pasture

TES Map Unit:	477	Acres in Pasture:	4,362
		% of Pasture:	50



Photo 8 above: Key TEUI map unit in Brushy Pasture, TEUI 477, August 2015

A key map unit in the Brushy pasture, TEUI 477, is a piñon-juniper woodland found on hills with gentle to steep slopes (0-40%) and it makes up half of the acres in this pasture. The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNV. Soils are shallow, extremely bouldery, loamy coarse sand. Soils developed in granite, and rock outcroppings are common. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 1-29% comprised of Juniper and piñon pine, shrub cover ranges from 38-51% cover primarily consisting of turbinella oak. Perennial grass cover will vary depending on shrub and tree cover ranges from 4-7%.

The data to describe existing vegetation was collected August 2015. Grasses were in good to excellent vigor at the time of sampling. This particular location looked to have received much more rain than other areas to the east and south. Sampling occurred prior to grazing.

Total perennial grass cover was 28%, double the ET graminoid cover average. The 8 grass species found on site compare favorably with the ET that describes 7 species. Diversity is especially good as 16% of the cover is made up from cool season grasses. This site was treated with fire within the last 15 years.

TEUI 481, Burnt Pasture

TES Map Unit:	486	Acres in Pasture:	601
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	% of Pasture:	34
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A key map unit in the Burnt Pasture, TEUI 481, is piñon-juniper woodlands and grasslands on elevated and valley plains on the eastern boundary in the Williamson Valley area with gentle to moderate slopes (0-15%). This TEUI makes up the central part of this pasture. The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNVT. Certain areas of this TEUI were treated for juniper in the middle of the 20th century. This area had signs of past treatment, with old juniper trees and roots slowly decaying. The site average for tree cover is low due to previous treatments. Shrub cover is expected to be higher due to previous treatment, and graminoid cover is expected to be high.

The site was visited in September 2015. Blue grama and sideoats rated as fair vigor, an indication that this area received less precipitation than areas north and west. Condition of browse was good with historic use noted as being light (<20%). Manzanita had berries but other shrubs did not. Canopy cover of perennial grasses was estimated at 6%, less than the ET graminoid cover average of 14%. Shrub cover was high at 27% above ET average of 18%, dominated by turbinella oak (20%). The vegetation is meeting desired condition for a site with predominantly shrub cover.

TEUI 481, Tailholt Pasture

TES Map Unit:	481	Acres in Pasture:	2,072
		% of Pasture:	21



Photo 9 above: Key TEUI map unit in Tailholt Pasture, TEUI 481, September 2015

A key map unit in the Tailholt Pasture, TEUI 481, are piñon-juniper woodlands and grasslands on elevated and valley plains on the eastern boundary in the Williamson Valley area with gentle to moderate slopes (0-15%). This TEUI makes up the central part of this pasture. The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNV. Certain areas of this TEUI were treated for juniper in the middle of the 20th century. This area had signs of past treatment. Expected tree cover is low due to previous treatments. Shrub cover is expected to be higher due to previous treatment, and graminoid cover is expected to be high.

The data to describe existing vegetation was collected September 2015. Blue grama and sideoats rated as good vigor and threeawn rated excellent vigor, an indication that this area received well timed precipitation. Two transects were established, one in the valley (grassland) and one on the slope (shrub dominated). Total perennial grass cover of 44%, is above that of the ET graminoid average of 36%. Shrub cover was high at 11% above the ET average of 5%, dominated by turbinella oak (7%). Desired vegetation conditions are being met in this pasture key area.

TEUI 490, Humphrey Pasture

TES Map Unit:	490	Acres in Pasture:	468
		% of Pasture:	10



Photo 10 above: Key TEUI map unit in Humphreys Pasture, TEUI 490, September 2015

A key map unit in the Humphreys Pasture for the west side of the pasture (Wikiup Mesa), TEUI 490, is a juniper woodland common on mesas. Slopes average 5% (0-15%). The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNV. Soils are deep, very stony, silt loam with shrink/swell properties. Soils developed on basalt parent material are extremely cobbly to extremely stoney, clay loam or sandy clay loam with high shrink/swell properties. The

site average is variable among for tree, shrub, and graminoid cover. Tree cover ranges from 10-35% comprised of juniper, shrub cover ranges from 4-19% cover primarily consisting of broom snakeweed. Perennial grass cover will vary depending on shrub and tree cover, ranging from 5-39% and dominated by blue grama.

The data to describe existing vegetation was collected September 2015. The growing season in 2015 had about average precipitation and grasses were in good (blue grama) and excellent (sideoats grama and squirreltail) vigor at the time of sampling. Cattle were currently in this pasture with one week left and use on sideoats grama was at 32% by weight. Total perennial grass cover was 19% about half of ET total graminoid cover average. Four species of grass were on site compared to 6 for the ET. High cover of broom snakeweed is described as indicating heavy grazing pressure. Snakeweed cover on this site is 13%. Browse use on cliffrose and turbinella oak was light for the current year, but historical use was moderate to severe. This key area location for the west side of the Humphreys Pasture is meeting desired conditions for vegetation in contrast with the east side of the pasture that is not.

TEUI 490, Tailholt Pasture

TES Map Unit:	490	Acres in Pasture:	1,548
		% of Pasture:	16

A key map unit in the southern portion of the Tailholt Pasture, TEUI 490, is a juniper woodland common on Smith and Tailholt Mesa and is further described above. The data to describe existing vegetation was collected September 2015. The growing season in 2015 had about average precipitation and grasses were in fair (blue grama) and good (sideoats grama) vigor at the time of sampling. Total perennial grass cover was 10% about half of the ET graminoid cover average. Three species of grass were on site compared to 6 for the ET. High cover of broom snakeweed is described as indicating heavy grazing pressure; there was no snakeweed encountered on this site. It is noted that as the slope increased the perennial grass cover increased. The site exhibits mid-similarity for perennial grasses to the ecological type, and is meeting desired condition for vegetation.

TEUI 491, Cottonwood Pasture

TES Map Unit:	491	Acres in Pasture:	253
		% of Pasture:	6

A key map unit in the Cottonwood Pasture, TEUI 491, is a piñon-juniper woodland on hills of Smith Mesa. Slopes average 20% (12-40%). The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNV. Soils are moderately deep, extremely stony, loam. Soils developed on basalt and have shrink/swell properties. The site average is variable among the community types for tree and graminoid cover. Tree cover ranges from 24-34% comprised of juniper. Perennial grass cover will vary depending on shrub and tree cover ranging from 14-30% dominated by blue grama. Shrub cover is less variable within the range of 19-22% cover primarily consisting of mountain mahogany.

The data to describe existing vegetation was collected September 2015. The growing season in 2015 had about average precipitation and sideoats grama and threeawn were in excellent vigor at the time of sampling. Livestock were in the pasture when data was collected. Utilization measured on sideoats grama was 17% by weight. This affects total canopy cover. Sideoats grama is a robust plant that reaches 30" or more.

Total perennial grass cover was 28%, 10% more than the ET graminoid average. Six species of grass were on site which matches the ET diversity. Similarity for grass rated low (20%) primarily due to lack of key species indicator plants for the ecological type. Due to the high canopy cover present from desirable grass species, and the diversity of species encountered, this site is considered to be meeting desired conditions for vegetation.

TEUI 542, Camp Wood Pasture

TES Map Unit:	542	Acres in Pasture:	1,444
		% of Pasture:	29

A key map unit in the Camp Wood Pasture, TEUI 542, is a ponderosa pine forest on elevated plains west of Apache Creek with gentle to moderate slopes (0-15%). The vegetation for this map unit fits within the Ponderosa Pine Evergreen Oak PNVT. Soils are shallow to moderately deep; very cobbly, very gravelly, or very stony. Texture is sandy loam from granite parent material. The vegetation is diverse with three major components dominated by ponderosa pine. Variations have different amounts of Arizona oak, Emory oak, and Gambel oak. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 27-56% dominated by ponderosa pine, shrub cover is between 8 and 22% primarily from turbinella oak. Perennial grass cover will vary depending on shrub and tree cover ranging from 4-7% dominated by blue grama.

The data to describe existing vegetation was collected late August 2015. The growing season in 2015 had about average precipitation and blue grama rated excellent vigor at the time of sampling. Livestock had not been in this pasture for about one year. Total perennial grass cover was 12%, half of the ET graminoid average. Four species of grass were on site which is one less than the ET. Similarity for grass rated mid-similarity to the ET, and desired conditions are being met at this pasture key area.

Table 6: Summary of Desired Vegetation Status and Rangeland Management Status by Pasture on the Williamson Valley Allotment

Pasture	TEUI Map Unit	Desired Vegetation Status	Trend	Rangeland Management Status
Burnt	48	Low similarity for grasses	Stable	Satisfactory
	481	Mid similarity for grasses	Stable	Satisfactory
Humphreys	461	Low similarity for grasses	Downward	Unsatisfactory
	481	Low similarity for grasses	Downward	Unsatisfactory
	490	Mid similarity for grasses	Stable	Satisfactory
Stinson	448	Low similarity for grasses	Stable	Satisfactory
	475	Mid similarity for grasses	Stable	Satisfactory
Tailholt	481	Mid Similarity for grasses	Stable	Satisfactory
	490	Mid Similarity for grasses	Stable	Satisfactory

Brushy	477	Mid similarity for grasses	Stable	Satisfactory
Upper Hitt	434	High similarity for grasses	Stable	Satisfactory
Lower Hitt	48	Low Similarity for grasses	Stable	Satisfactory
Little Pine	48	Low Similarity for grasses	Stable	Unsatisfactory
Whiskey	48	Mid similarity for grasses	Stable	Satisfactory
Camp Wood	542	High similarity for grasses	Stable	Satisfactory
Cottonwood	491	Low Similarity for grasses	Stable	Satisfactory

Invasive Plant Species

Noxious weed surveys have not been conducted specifically on these allotments. Isolated occurrence of saltcedar is known to be present in some drainages. 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. Possible treatment of known weed populations will be managed under the PNF’s noxious weeds program and will not be further addressed in this proposal.

Direct & Indirect Effects on Vegetation

The Vegetation and Range Management Specialist Reports address the direct, indirect, and cumulative effects of each alternative. A summary of the effects is provided here, with further details found in the complete reports in the project record.

Alternative 1

General Grazing Effects: 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. Range research supports the concept that forage plant productivity, and overall ecological condition of rangelands, can be improved or maintained through properly managed livestock grazing (Holecheck, et al. 1999). The utilization guidelines as prescribed for this project have been shown to maintain forage production (Holecheck et al. 2004). Loeser, et al. (2007) compared the effects to vegetation composition and cover of three grazing practices on a semiarid grassland site near Flagstaff, AZ. The study was conducted during a period of recurrent drought from 1997 to 2004. The three grazing treatments were no grazing, high-impact grazing, and moderate grazing (less than 50% biomass removal). The study showed that the effect of the various grazing treatments on plant cover depended on environmental conditions that fluctuate over time, such as precipitation. They found that high-impact grazing brought about a decrease in plant cover over time, but treatment plots where cattle had been removed demonstrated no consistent differences in cover from the moderately grazed treatment plots.

Climate and rainfall will have the most significant impact on the cover and vigor of perennial grasses when grazing is properly managed. A study describing 30 years of weather influence on

ungrazed areas in New Mexico found that sideoats grama reduced in canopy cover by almost half in 2007 as compared to 1977 in response to decreased precipitation (Moir 2011). Research by Molinar et al. (2011) showed that during a 38-year study period on Chihuahuan desert rangelands, managed livestock grazing and excluded livestock grazing had the same long-term effects on change in plant frequency and rangeland ecological condition when use levels were kept at conservative or moderate rates in most years.

The prescribed use levels in areas rated as satisfactory would allow for retaining 55-65% of the plant biomass on-site as residual biomass. This residual biomass, or mulch, provides beneficial functions by protecting the soil surface from erosion, enhancing water infiltration, and shading the soil surface from evaporation of soil water. The benefits of retaining sufficient residual mulch have been shown to translate into increased forage production in a number of studies discussed by Molinar et al (2001).

Smith Canyon

At the key TEUI inventory sites on the allotment, the existing canopy cover and species composition is found to be meeting desired condition for vegetation in all pastures except TEUI 427 in the Smith Canyon Pasture. With grazing management that includes integration of rest, pasture deferment to allow grasses to reproduce, and adherence to allowable use levels, the desired conditions for vegetation should be sustainable. Adequate precipitation is essential to achieving optimal plant vigor and production. The proposed new water sources and fences will aid in proper livestock distribution so that under-utilized areas will take away some of the grazing pressure from traditional congregation areas. New water sources will also alleviate cattle watering at springs and drainages.

Areas needing improvement in vegetation condition or soil condition are prescribed either incidental use levels of 0-30% (Smith Canyon Pasture TEUI 427, Spider Pasture TEUI 486, and Smith Mesa Pasture 490) or are being managed to allow for periods of rest or deferment (Granites TEUI 461). Incidental use will allow plant biomass (>70%) to be retained on site to protect and be incorporated into the soil to improve organic matter and infiltration of water. Integrating seasonal deferment allows plants to fully mature and full rest will allow that vegetative material to remain on site until new growth occurs. Natural die off of some portion of the roots of perennial plants adds to soil organic matter.

The actual use records for the allotment from 2000 through 2014 show a range of stocking levels from 240 Animal-Months (AMs) in 2003, and up to 3,088 AMs in 2009, equivalent to 257 cattle yearlong. This average stocking for this period is equivalent to 173 adult cattle yearlong. Historically, this allotment was stocked much higher. The term grazing permit authorized up to 548 cattle in 1960. Periodic reductions have occurred since then to balance grazing use with forage production capacity. It is likely that some or all of the areas not currently meeting desired conditions for vegetation and soils is a result of the historically high grazing impacts.

Using the methods outlined in Holecheck (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 were calculated at 274 head yearlong (3288 AUM) when 45% of the available forage estimate is allocated to livestock. Yearly fluctuations in forage production based on precipitation levels will be taken into account by adjusting yearly stocking through adaptive management.

Williamson Valley

Desired vegetation condition is being met in 9 of the 11 pastures inventoried for existing vegetation condition at key areas. The implementation of 35-45% allowable use will provide for maintaining herbaceous plant cover, density, and vigor. Biomass retained after grazing will protect soils and enhance water infiltration. The incidental use levels (0-30%) proposed in Little Pine Pasture TEUI 48, Tailholt Pasture TEUI 490, East Humphreys Pasture TEUIs 461 and 481, and Whiskey Pasture TEUI 48 should help to improve forage plant vigor and density and allow for extra plant litter to build up to protect soil and improve soil infiltration and functionality. Adequate precipitation is essential to achieving optimal plant vigor and production. The proposed new water sources will aid in proper livestock distribution so that under-utilized areas will take away some of the grazing pressure from traditional congregation areas. More reliable upland water will also alleviate cattle watering in riparian areas of streams and springs.

The actual use records for the allotment from 2000 through 2014 show a range of stocking levels from 375 Animal-Months (AMs) in 2002, and up to 3,570 AMs in 2014, equivalent to 298 head of cattle. Reductions in authorized cattle numbers have occurred over the past: from 1936-1968, 491 cattle yearlong, then in 1968 it was reduced to 400 head. As recent as 2006 the authorized number was reduced to 300 cattle yearlong. With our current understanding and scientific research, 300 head will allow us to maintain the vegetation at a level similar to ecological type description.

Using the methods outlined in Holecheck (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 Unit Months calculated would support 297 head of cattle (3617 AUM) when 45% of the available forage estimate is allocated to livestock. This calculation is done with approximately 2,300 acres of Humphreys Pasture being considered no capacity and being removed from the calculation. The forage production values given in the TES survey are overall average for TEUI units forest-wide 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.

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 than alternative 1 in vegetation cover, vigor, and composition in areas not influenced by woody plant canopy. Where shrub or tree cover is currently greater than would be expected for the potential plant community, there will likely be limited to no improvement in perennial grass cover unless the tree and/or shrub canopy is removed by fire or vegetation treatments at a later date. 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 Forest Service or partnership funds 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

Alternative 1:

Structural Range Improvements: 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 into under-utilized areas. 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 with hand tools along the fenceline. Access to existing improvements for maintenance and new improvements by overland travel with machinery will damage some herbaceous plants in a limited area. These plants should recover quickly once precipitation occurs. No new roads will be developed to construct new improvements. Travel ways to access new improvements will be surveyed for cultural properties to avoid impacts during construction. 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: No new structural range improvements would be constructed under this alternative. If grazing is eliminated, some existing range improvements may be removed and this could cause some ground-disturbance. Archeological surveys would be needed prior to any ground disturbing activity so that no cultural resources were impacted from the activity.

Cumulative Effects on Range Vegetation Resources

The cumulative effects analysis area considered for effects on range/vegetation resources consists of the two allotments that comprise the project area. The past and present activities and events that have affected the vegetation include livestock and wildlife grazing, past wildfires, prescribed fire, past vegetation management, range improvement construction, recreational uses, and roads. These activities may affect vegetation in ways similar to livestock grazing through removal of herbaceous 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 have shown that the impacts of some past prescribed fire or juniper thinning activities are evident by the reduced shrub or tree cover from site potential. Shrub and tree cover will increase to site potential levels over time. It is desirable to maintain various seral stages in woodlands and shrublands to create wildlife habitat complexity. Site visits show that impacts from recreational activities on the allotments are limited to small, localized areas consisting of dispersed camping spots along main roads, especially in the Camp Wood area. The Arizona Motorcycle Riders Association Sheridan Mountain Showdown uses the Sheridan Mountain trails for an 80 mile timed race. The vegetation impacts created through livestock grazing, improvement construction, and adaptive management as described for alternative 1, when added to the other past, present and future activities 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

3.3 What Are the Costs Associated with the New Range Developments and Who Will Pay for This?

The cost of constructing new range developments on a Forest Service grazing allotment is typically shared between the agency and the grazing permit holder according to policy (Forest Service Manual 2200, Chapter 2240). Financing range improvements can be accomplished using Range Betterment Funds (RBF). The RBF consists of one-half the grazing fees collected that are returned to fund range improvement work on the forest where the fees are collected. On the Prescott National Forest, the RBF is typically in the range of \$60,000-\$80,000 per year to fund all the range development construction and reconstruction work across the forest. The grazing permittee can provide either labor or materials to construct range improvements, but the ownership of the improvement remains with the Forest Service. By proposing the new range improvements analyzed under alternative 1, there is no commitment made that funding will be available from RBF to implement the project. Which projects are funded each year is dependent on a forest-wide prioritization process for RBF expenditures.

For alternative 1, several new range improvements are planned for construction. The cost of these range improvements are estimated to be about \$20,000 each for the new water developments, and fence construction costs about \$12,000 per mile. Range developments that have benefits for wildlife habitat such as water developments may receive funding from external partners vested in activities to promote wildlife habitat improvement.

3.4 What are the Impacts to Soils and Watersheds?

The desired condition for soils as developed by the ID team is the maintenance of soils in satisfactory condition over the long-term, or shows improvement in areas departing from satisfactory condition where livestock grazing is contributing to the departure. This is in agreement with the Forest Plan desired condition that “soil condition rating is at or trending toward satisfactory”. Also stated in the Forest Plan, “vegetative ground cover is distributed across the soil surface in sufficient proportions to meet or trend toward “natural” conditions listed for each map unit in the Terrestrial Ecosystem Survey.”

Existing Condition:

Soil and vegetation field data was collected by the Prescott National Forest Rangeland Core Team which consists of the rangeland management specialist, ecologist, and soil scientist. Locations for data collection were described within the vegetation section by TEUI soil map unit. Soil condition is an evaluation of soil quality or the capacity of the soil to function within ecosystem limitations to sustain biologic productivity, maintain environmental quality, and promote plant and animal health (USDA FS 2013). 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 measurements were collected to determine ground cover, spatial distribution of bare spaces, soil bulk density (a measure that will influence water infiltration), as well as a checklist of qualitative soil attributes.

There are a myriad of elements and management activities that influence and contribute to soil conditions. Past and present management actions and processes that contribute to existing soil conditions are described in the Smith Canyon and Williamson Valley: Soil and Watershed Cumulative Effects report in the project record. The Smith Canyon Grazing Allotment: Soil Analysis report contains the detailed disclosure of existing condition and expected project outcomes and is found in the project record. Recognizing there are many influencing factors resulting in existing soil conditions, this analysis focuses on how livestock grazing contributes to

soil function. The following narratives display existing soil condition for each representative map unit that was analyzed by allotment.

Smith Canyon Allotment

Table 7. Current soil condition on the Smith Canyon Allotment key soil map units

Pasture	TEUI	Pasture Acres	Existing Soil Condition
Cottonwood	425	6,318	Satisfactory
Smith Canyon	427	14,362	Unsatisfactory
	461		Impaired
Granites	461	4,705	Unsatisfactory/Impaired
	477		Satisfactory
Spider	462	7,123	Satisfactory
	486		Satisfactory/Unsatisfactory
Jones	486	1,735	Satisfactory
Moano	486	2,070	Satisfactory
Smith Mesa	490	4,730	Impaired/Unsatisfactory

The desired condition for soil is to be maintaining all necessary soil functions and be rated in satisfactory condition. Desired condition is being met in 3 of the 7 pastures (Jones, Moano, and Cottonwood), and is being met in some key areas of the Granites and Spider Pastures. Those key areas needing improvement are further described here.

Smith Canyon Pasture, TEUI 427: Soils are in unsatisfactory condition. Compaction and soil displacement is prevalent. However bulk density and rupture resistance indicates shrink-swell properties are enabling the compacted soils to “open up” which enables an increase of pore space (USDA NRCS 2001). The combined cover of litter and basal vegetation (vegetative ground cover) was measured at 25% and the potential cover for TEUI 427 is 25%. The management objective is to improve graminoid cover and vegetation spatial distribution to allow for an increase in organic matter that would aid in reducing compaction and enhance water infiltration. Vegetation that is evenly distributed assists in breaking up overland water flow patterns that can lead to surface erosion.

Smith Canyon Pasture TEUI 461: Soils are in impaired condition predominantly due to compaction and low litter levels. Graminoid cover is high and well distributed across the site and occupies a large portion of the landscape. This is providing stability for the soils. Soil compaction is evident by high bulk density levels, blocky soil structure, and hard rupture resistance. Compaction and the lack of pore space has resulted in low internal and surface organic matter levels. This has reduced the soils nutrient cycling and hydrologic function. Vegetative cover was measured at 29% while the potential cover is 30%. Bare soil was 35% while the potential is 15% since there is less surface rock present at the sampling location. The management objective is to improve vegetative ground cover levels and its spatial distribution, species diversity, and decrease compaction.

Granites Pasture TEUI 461: Soils associated with the closed-tree state (i.e. dense juniper cover) are in unsatisfactory condition. The dense juniper canopy cover has resulted in the loss of vegetative cover from herbaceous plants leading to a lack of protective ground cover and organic matter in the soil. This has resulted in widespread sheet erosion evidenced by gully in some areas; hummocking of trees; and loss of the A-soil horizon. Sampled soil conditions that are associated with the open-tree successional state are impaired. Accelerated run-on from adjacent unsatisfactory sites has resulted in elevated overland flow within the graminoid

interspaces. The graminoid cover is well distributed but the proportion of the landscape occupied by graminoid cover is lacking resulting in the lack of surface litter and lower internal organic matter. Sampled vegetative cover (litter and basal vegetation) was 15% compared to 21% at potential. The management objective is to improve and maintain graminoid cover, diversity, and vegetation spatial distribution to intercept overland water flow and enhance water infiltration.

Spider Pasture TEUI 486: The sampling site is in an open shrub successional state. This consists of a mosaic pattern of dense chaparral and openings that support forbs and graminoids. Areas associated with dense chaparral are in satisfactory soil condition. The litter directly affiliated with the dense shrub species is producing ample amounts of litter for soil protection and nutrient cycling. Litter cover is providing soil stability and being incorporated as internal soil organic matter (Mapfuma 2002). The large mosaic openings located within the open shrub component are exhibiting unsatisfactory soil conditions. Soil structure shows signs of compaction and minimal pore space which retards infiltration, increases run-off, and elevates soil loss (Brady 1990, USDA NRCS 2001). Continuous sheet erosion is prevalent with the formation of erosion pavement in places. Organic matter is sparse and not being incorporated into the soil resulting in a loss to the nutrient cycling function. Vegetative ground cover at the sampling site was 39% compared to 36% at potential, although some areas away from the sampling site had cover below site potential. The management objective is to improve graminoid cover, vegetation spatial distribution, and vegetative ground cover within the mosaic openings.

Smith Mesa Pasture TEUI 490: Soil conditions are impaired/ unsatisfactory. Unsatisfactory soil conditions are generally affiliated with juniper treated areas in a grass-forb successional state. Impaired soils are generally affiliated with areas associated with an open-tree successional state. Soils are compacted as indicated by bulk density measurements and massive to platy soil structure. Soil displacement due to hoof impact when the soils are wet is prevalent in areas associated with the grass-forb successional state. The soil displacement has damaged the soil structure ability to retain aggregation and connectivity of pore space. Spatial vegetation is poor as indicated by the spatial gap data which indicates a large proportion of the area is not protected by vegetative cover. Bare soil levels are high and susceptible to splash and sheet erosion (USDA NRCS 2001). Measured soil vegetative cover was 7% compared to 30% for the potential of the soil map unit. Management objectives are to improve compacted soils and vegetation spatial gap distribution. Maintain or improve graminoid cover and vegetative ground cover levels that are similar to exclosure reference conditions and TEUI potential.

Williamson Valley Allotment

Table 8. Current soil condition on the Williamson Valley Allotment key soil map units

Pasture	TEUI	Pasture Acres	Existing Soil Condition
Little Pine	48	569	Impaired
Burnt	48	1,759	Satisfactory/Impaired
Lower Hitt	48	1,406	Satisfactory
Whiskey	48	827	Unsatisfactory
Upper Hitt	434	2,349	Satisfactory
Stinson	448	8,545	Satisfactory
Brushy	477	8,656	Satisfactory
Tailholt	481	9,741	Satisfactory
	490		Unsatisfactory
Humphreys	490 (West)	4,739	Satisfactory

	461, 462, 481, 490 (East)		Unsatisfactory
Cottonwood	491	4,454	Satisfactory
Camp Wood	542	5,057	Impaired

The desired condition for soil is to be maintaining all necessary soil functions and be rated in satisfactory condition. Desired condition is being met in 5 of the 11 pastures, and is being met in some key areas of the Burnt, Tailholt, and Humphreys Pastures. Those key areas needing improvement are further described here.

Little Pine Pasture TEUI 48: Soils are in impaired soil condition. Litter is lacking within interspace and soils are compacted. Graminoid cover is well distributed with favorable basal cover but accelerated erosion is present resulting in pedestalled plants. Vegetative groundcover measured was 32% compared to site potential of 70%. The management objective is to improve graminoid cover and vegetative cover to stabilize soils and alleviate compaction.

Burnt Pasture TEUI 48: Soils are exhibiting satisfactory and impaired characteristics. Graminoid cover is high and above potential and well distributed across the site. This has contributed to stable soils (USDA NRCS 2001, Bird 2007). However, soil compaction is present and litter levels are low resulting in the reduction to the nutrient cycling and hydrologic function. The vegetative groundcover measured was 29% compared to site potential of 45%. The management objective is to maintain graminoid basal cover and improve litter levels to alleviate soil compaction.

Whiskey Pasture TEUI 48: Soils are in unsatisfactory condition. Sampled location is associated with high levels of Apache Plume that support high graminoid cover and favorable vegetative spatial distribution. Some soil compaction is occurring as indicated by elevated soil bulk density measurements. Although sampled area had 53% vegetative groundcover compared to the site potential of 45%, there are some areas in the soil map unit that have high levels of bare soil with minimal vegetative cover protection. The management objective is to establish graminoid cover, vegetative ground cover, and alleviate compaction on bare areas to enable an improvement toward TEUI potential.

Tailholt Pasture TEUI 490: Soils are in unsatisfactory soil condition. The graminoid vegetative layers are absent or sparse and high levels of bare soil are present. Vegetation spatial distribution is unfavorable resulting in widespread continuous overland patterns across the landscape. In some areas, graminoid cover is present but is providing minimal soil protection. The soil hydrologic processes, stability, and nutrient cycling is non-functional. Extensive sheet erosion is widespread and connected into definite patterns resulting in extensive sheet erosion, hummucking of prominent vegetation, the partial loss of the A-horizon, and erosion pavement development. Surface and internal organic matter is lacking resulting in minimal to no nutrient cycling. The measured vegetative cover is 10% compared to the site potential of 20%. The management objective is to improve vegetative ground cover, spatial vegetation gap, and graminoid cover.

Humphreys Pasture TEUIs 461, 462, 481, and 490 (east part of pasture): Soils are in unsatisfactory soil condition. These soils are associated with piñon/juniper ecosystems with a basalt lithology. All of the units generally have a high juniper canopy cover with a sparse/absent graminoid component. Dense juniper canopy cover can result in the loss of herbaceous plant cover that results in a loss of protective ground vegetative cover and organic matter. TEUI 462, which is associated with hill landforms and steeper slopes, also supports a shrub component. Shrub cover normally produces high litter levels but this is not occurring because of the widespread accelerated overland flow and loss of any litter recruitment. This has resulted in the formation of erosion pavement. Bare soil is high and prevalent which has resulted in accelerated

soil loss in the form of sheet erosion, rills, and gulying. Accelerated erosion patterns are actively expanding, well-defined, continuous, and connected into a well-defined pattern. Litter and internal soil organic matter is lacking resulting in minimal nutrient cycling and a loss to the hydrologic function. Due to accelerated erosion and unsatisfactory soil condition, this area is not considered capable of supporting grazing and was removed from grazing capability calculations for the allotment.

Camp Wood Pasture TEUI 542: Soils are in impaired condition. Soils directly associated with ponderosa pine and shrub species have ample needle cast and surface litter for soil stabilization and nutrient cycling. However, areas outside the influence of ponderosa pine are experiencing accelerated sheet erosion. These unstable vegetative openings support graminoid cover but the proportion of the landscape covered by graminoid vegetation is low, as indicated by the spatial gap measurements. This has resulted in continuous overland-flow patterns that are connected and associated with sheet erosion. Soil compaction is also present as indicated by platy soil structure and elevated bulk density measurements. This has resulted in a decrease in infiltration and increase in run-off (Van Haveren 1983, Castellano 2007). Graminoid cover and vegetative ground cover is low which has reduced the nutrient cycling capacity. Measured vegetative cover was 39% compared to site potential of 65%. The management objective is to improve graminoid cover, vegetative gap distribution, and vegetative ground cover.

ENVIRONMENTAL EFFECTS

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 very variable and could take up to 100 years on some soils associated with unsatisfactory condition.

Smith Canyon Allotment

The following analysis of direct and indirect effects is based on research findings and rationale provided in detail in the specialist's report.

Table 9. Direct and indirect effects of grazing versus no grazing to soil condition on the Smith Canyon Allotment.

Pasture	TEUI	Existing Soil Condition	Alternative 1: Grazing	Alternative 2: No Grazing
Cottonwood	425	Satisfactory	Satisfactory	Satisfactory
Smith Canyon	427	Unsatisfactory	Impaired	Impaired/Satisfactory
Granites	461	Unsatisfactory/Impaired	Unsatisfactory/Impaired	Unsatisfactory/Impaired
Smith Canyon	461	Impaired	Satisfactory	Satisfactory
Spider	462	Satisfactory	Satisfactory	Satisfactory
Granites	477	Satisfactory	Satisfactory	Satisfactory
Jones	486	Satisfactory	Satisfactory	Satisfactory
Moano	486	Satisfactory	Satisfactory	Satisfactory
Spider	486	Satisfactory/Unsatisfactory	Satisfactory/Impaired	Satisfactory/Impaired
Smith Mesa	490	Impaired/Unsatisfactory	Impaired	Satisfactory

Alternative 1: Grazing

Cottonwood-425, Spider-462, Granite-477 and Jones 486 are all within the Piñon-Juniper Shrub and Chaparral PNVT which support high levels of shrub cover. All of these soils' satisfactory 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. Some interspaces are experiencing some elevated runoff and erosion within the interspace but soils are in functional status. In addition, Jones-486 and Granite-477 interspaces are extremely bouldered and well armored which is stabilizing the soils. Utilization guidelines would continue to maintain residual graminoid cover within the shrub interspaces for additional soil protection. Soil would remain in satisfactory condition.

Smith Canyon-427 is in unsatisfactory condition and affiliated with the Juniper Grassland PNVT. Smith Canyon-461 is located within a Piñon-Juniper Shrub PNVT and is in impaired condition. To obtain management objectives, project design features include integrating rest and seasonal deferment to improve soil compaction and controlling water access and herding to improve pasture distribution. Prescribe incidental use levels (0-30%) in TEUI 427 to promote biomass retention and subsequent litter development. These practices would alleviate compaction by discouraging concentrated use, allow additional recovery periods and retain additional biomass and mulch for soil function. This would allow soils to improve to impaired condition. Livestock use would continue to have some soil impacts from hoof impacts and partial removal of biomass.

Granites-461 is located in the Piñon Shrub PNVT and exhibits unsatisfactory/impaired soil condition. Unsatisfactory conditions are affiliated with dense juniper cover which is limiting herbaceous recruitment resulting in accelerated runoff and erosion in the form of extensive erosion pavement. Impaired soil conditions are affiliated within the interspaces which support herbaceous cover that is below TEUI potential by half. The management objective for TEUI 461 is to improve litter and graminoid cover and vegetation spatial distribution. Design features include deferred season of use to allow further graminoid biomass retention and control access to water facilities to improve distribution. An additional water source is proposed that would distribute cattle away from the area needing improvement. This would decrease the frequency and duration of use and utilization level would decrease slightly. EA proposed levels of 35-45% use would subsequently result in less hoof impact and some increase in biomass retention, and surface and subsurface may improve slightly. Accelerated run-off, soil instability, subsequent loss of organic matter, and further reduction to nutrient cycling could have a higher probability of stabilizing. Overall, impaired/unsatisfactory soil conditions would likely remain the same. Erosion pavement from adjacent unsatisfactory sites could expand resulting in continued impacts to soil conditions.

Spider-486 is within the Piñon-Juniper Shrub PNVT and exhibits a combination of satisfactory and unsatisfactory conditions. Soils exhibiting satisfactory conditions are affiliated with dense shrub cover areas that provide high litter levels for soil stability protection, favorable soil structure and infiltration, and nutrient cycling. However, the interspaces are experiencing some elevated runoff and erosion. Livestock use may have negligible impacts to these areas but the high shrub cover and litter production would maintain functional soil status. Project design features of incidental use (0-30%) in the mosaic openings would alleviate concentrated use and allow additional recovery periods for compaction and retain additional biomass and mulch for soil function. This would allow soils to improve to impaired condition.

Moano-486 is in the Piñon-Juniper Shrub PNVT but the sampled area is representative of a grassland. Soil conditions are satisfactory. Adaptive management measures and Best

Management Practices would continue to be practiced. Standard grazing intensity levels would be employed and be commensurate with soil conditions. This will allow sufficient residual biomass for vegetation ground cover retention and protection of the soil resources.

Smith Mesa-490 is in impaired or unsatisfactory condition and affiliated with the Piñon-Juniper Grass PNV. Impaired conditions are affiliated with areas supporting juniper cover. Unsatisfactory soil conditions are associated with grasslands where the juniper species have been previously treated. To achieve management objectives, project design features include the integration of rest to alleviate soil compaction and the use of management practices such as controlling water access and supplement locations to discourage concentrated use in TEUI 490 with incidental use levels prescribed as 0-30% until conditions improve. If these management options are not successful in improving soil condition, then a fencing option is proposed that would split the pasture and allow for more control of livestock access to areas needing improvement. These practices would alleviate compaction by discouraging concentrated use, allow additional recovery periods, and retain additional biomass and mulch for soil function. This would allow soils to improve to impaired condition.

Alternative 2: No Grazing

Cottonwood-425, Spider-462, Granite-477 and Jones 486 soil conditions would be similar to those described in Alternative 1 and remain in satisfactory soil condition. The dense shrub cover biomass and litter production would continue to provide soil stability protection, favorable soil structure and infiltration, and nutrient cycling. No grazing would show a negligible to no difference as described in Alternative 1. However, graminoid cover and litter within the interspace may show improvement and provide additional soil protection, because no grazing would occur. Jones-486 and Granite-477 interspaces would show no difference because of the armoring of the interspaces associated with extremely high presence of boulders.

Smith Canyon-427 unsatisfactory soil conditions would be expected to improve because no grazing impacts would occur. 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 reduce soil compaction and improve soil structure. Nutrient cycling and infiltration rates would improve resulting in a decrease in run-off and soil stability. Soil conditions would be expected to move toward satisfactory condition but it may be limited due to climatic restrictions as represented by the presence of desert shrub species. Soil conditions would be expected to achieve satisfactory or impaired condition.

Granites-461 soil conditions would improve but soil condition status would remain in unsatisfactory or impaired condition. No grazing would allow graminoid and organic matter production to improve and subsequently retard accelerated erosion, to an extent, within the interspaces. Improvement would be expected to occur predominantly within the interspaces and would assist in stabilizing impaired soil conditions. However, the high density of juniper cover would continue to limit the soils ability to recruit an herbaceous component and would have large portions that would remain in unsatisfactory condition. Unsatisfactory soils would continue to influence adjacent impaired soils with accelerated run-on and soil deposition.

Smith Canyon-461 would improve as depicted in Alternative 1 but to a greater extent. Vegetative groundcover and its spatial distribution are expected to remain the same but could show some improvement because the lack of grazing. Soil compaction associated with hoof impact would not occur. This would result in soil conditions improving to satisfactory status.

Moano-486 would remain in satisfactory soil condition because no livestock grazing would occur. Existing elevated vegetation ground cover would be retained on site for nutrient cycling, favorable soil structure and infiltration, and soil stability.

Spider-486 soil conditions, affiliated with dense shrubs, would be similar as described in Alternative 1 and remain in satisfactory soil condition. Measurable differences of soil conditions associated with Alternative 1 and Alternative 2 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. No grazing would show a negligible to no difference as described in Alternative 1. However, graminoid cover and litter within the interspace may show improvement and provide additional soil protection, because no grazing would occur.

Spider-486 unsatisfactory soil conditions, affiliated with mosaic openings, would be expected to improve to a greater extent than in Alternative 1 because no grazing impacts would occur. 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 improved soil stability. However, soil conditions would only improve to impaired status. The severely compacted soils would not recuperate in a timely manner because of its low shrink-swell properties associated with granitic coarse textured soils. In addition, the droughty characteristics of these coarse textured soils would limit its ability to recruit an herbaceous component.

Smith Mesa-490 unsatisfactory soil conditions would be expected to improve to satisfactory condition because no grazing impacts would occur. 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 reduce soil compaction and improve soil structure. Nutrient cycling and infiltration rates would improve resulting in a decrease in run-off and improved soil stability. Soil conditions would be expected to move toward representative conditions exhibited within the Smith Mesa enclosure (see Existing Condition section).

Williamson Valley Allotment

Table 10. Direct and indirect effects of grazing versus no grazing to soil condition on the Williamson Valley Allotment.

Pasture	TEUI	Pasture Acres	Existing Soil Condition	Alternative 1: Grazing	Alternative 2: No Grazing
Little Pine	48	569	Impaired	Satisfactory	Satisfactory
Burnt	48	1,759	Satisfactory/Impaired	Satisfactory	Satisfactory
Lower Hitt	48	1,406	Satisfactory	Satisfactory	Satisfactory
Whiskey	48	827	Unsatisfactory	Impaired/Unsatisfactory	Impaired
Upper Hitt	434	2,349	Satisfactory	Satisfactory	Satisfactory
Stinson	448	8,545	Satisfactory	Satisfactory	Satisfactory
Brushy	477	8,656	Satisfactory	Satisfactory	Satisfactory
Tailholt	481	9,741	Satisfactory	Satisfactory	Satisfactory
	490		Unsatisfactory	Impaired/Unsatisfactory	Impaired/Unsatisfactory
Humphreys	490 (West)	4,739	Satisfactory	Satisfactory	Satisfactory
	461,		Unsatisfactory	Unsatisfactory	Unsatisfactory

	462, 481, 490 (East)				
Cottonwood	491	4,454	Satisfactory	Satisfactory	Satisfactory
Camp Wood	542	5,057	Impaired	Impaired	Impaired

Alternative 1: Grazing

Little Pine-48 and Burnt-48 are both associated with riparian PNVTs. Impaired soil conditions that are intermixed with satisfactory conditions would improve to satisfactory condition. Management objectives would be achieved by implementing project design features including light utilization levels (0-30%) in Little Pine-48 and in the Burnt Pasture integrate rest to retain and improve vegetative ground cover and allow soil compaction to improve.

Whiskey-48 is associated with a riparian PNVT and exhibits unsatisfactory condition. Management objectives would be achieved by integrating rest and implementing light use (0-30%). This will assist in establishing and retaining graminoid cover and surface and subsurface organic matter to alleviate compaction and retard accelerated erosion. This could potentially result in an improved soil condition to impaired status. Load bearing stress associated with hoof activity would decrease and additional biomass and mulch would be retained on-site. Soil condition recovery would be limited due to accelerated run-on and sedimentation from adjacent upland sites in poor condition.

Upper Hitt-434, Stinson-448, Cottonwood-491, and Brushy-477 are all within the Piñon-Juniper Shrub and Chaparral PNVT which support high levels of shrub cover. 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. Some interspaces are experiencing elevated runoff and erosion but soils are in functional status. Utilization guidelines would continue to maintain residual graminoid cover within the shrub interspaces for additional soil protection.

East Humphrey-461; 462; 481; 490 are associated with Piñon-Juniper Shrub/Piñon-Juniper Grassland and are in unsatisfactory condition. Dense juniper cover associated with these TEUs has limited the ability to reestablish an herbaceous component resulting in the hydrologic, stability, and nutrient cycling to be in non-functional status. The management objective is to not exacerbate soil damage through livestock use. Design feature is to avoid prescribed grazing use in the east part of the pasture and have only incidental grazing use (0-30%). No grazing capacity is assigned to this area of the pasture and no practices to draw livestock (water and supplement placement) would occur in the no grazing capacity areas. Livestock incidental use may have negligible impacts to the soils. Soil conditions would remain in unsatisfactory condition.

Tailholt-481; West .Humphreys-490 (Piñon-Juniper Grassland PNVT) and Lower Hitt-48 (Riparian PNVT with strong grassland component) would remain in satisfactory condition. Adaptive management measures and Best Management Practices would continue to be practiced. Standard grazing intensity levels would be employed and be commensurate with soil conditions. This will allow sufficient residual biomass for vegetation ground cover retention and protection of the soil resources as described in Alternative 2.

Tailholt-490 is classified as a Juniper Grassland PNVT but this unit supports a high level of juniper cover. The unit would be assigned light use (0-30%) and additional water sources would be developed to improve distribution away from this map unit. Management objectives are to improve perennial grass and litter cover and their spatial distribution. This would facilitate a decrease of accelerated erosion. Improvement is expected to occur predominantly within the interspaces and may achieve impaired status. However, the high density of juniper cover would continue to limit the soils ability to recruit an herbaceous component and would have large portions that would remain in unsatisfactory condition.

Camp Wood-TEUI 542, within the Ponderosa Pine-Evergreen Oak PNVT, is expected to improve through adaptive management but remain in impaired condition. Soils are also impacted from recreational and hunting impacts which limit the soil's ability to attain satisfactory condition. Adaptive management measures would be employed to achieve soil management objectives. These include improving vegetation and litter cover to protect the soil from erosion, and improve the spatial distribution of plants to prevent accelerated sheet erosion. Project design features include integrating rest or deferment during the growing season to encourage grass plant establishment and litter development that can alleviate soil compaction. Standard utilization practices would continue to be practiced that would allow biomass retention and litter for soil protection

Alternative 2: No Grazing

Little Pine-48 and Burnt-48 impaired conditions would be expected to achieve satisfactory condition because of no livestock grazing. Soil conditions would improve, as described in Alternative 1, but to a greater extent. No impacts from livestock would result in no load bearing stress and full retention of plant biomass and litter. This would alleviate compaction, facilitate an improvement to nutrient cycling, and provide soil stability.

Whiskey-48 unsatisfactory soil conditions would be expected to improve to impaired condition because no grazing impacts would occur. 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 improved soil stability. However, soil condition recovery would continue to be limited due to accelerated run-on and sedimentation from adjacent upland sites in poor condition.

Upper Hitt-434, Stinson-448, Cottonwood-491, and Brushy-477 soil conditions would be similar to those described in Alternative 1 and remain in satisfactory soil condition. Measurable differences of soil conditions associated with Alternative 1 and Alternative 2 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. However, graminoid cover and litter within the interspaces might show improvement and provide additional soil protection because no grazing would occur.

No grazing of East Humphrey-461, 462, 481, and 490 would continue to result in unsatisfactory soil conditions as discussed in Alternative 1. Dense juniper cover associated with these TEUIs would continue to limit the ability to reestablish an herbaceous component resulting in the hydrologic, stability, and nutrient cycling to be in non-functional status. No grazing would show a negligible to no difference to conditions described in Alternative 1.

Tailholt-481 and West Humphreys-490 would remain in satisfactory soil condition because no livestock grazing would occur. Existing elevated vegetation ground cover would be retained on site for nutrient cycling, favorable soil structure and infiltration, and soil stability.

Tailholt-490 soil conditions would move toward improvement as identified in Alternative 1 but to a greater extent. No grazing would allow graminoid and organic matter production to improve and subsequently retard accelerated erosion to an extent. Improvement is expected to occur predominantly within the interspaces and may achieve impaired status. However, the high density of juniper cover would continue to limit the soil's ability to recruit an herbaceous component and large portions would remain in unsatisfactory condition.

Camp Wood-TEUI 542 would be expected to improve to a greater extent as described in Alternative 1 but would remain in impaired condition. Recreational and hunting impacts would continue to retard the soil's ability to attain satisfactory condition. However, no grazing impacts would alleviate hoof impacts that contribute to soil compaction, graminoid vigor would improve, and subsequently surface and subsurface biomass and organic for soil function would improve. This would improve the soils hydrologic, stability, and nutrient cycling function.

Range Improvements

The direct effects of the physical impact associated with range improvement installation and maintenance has the potential to decrease and damage protective vegetative ground cover, cause soil displacement, and compaction. This has the potential to decrease infiltration, increase runoff, accelerate soil loss, disrupt nutrient cycling, and ultimately negatively impact productivity. Soil disturbance and excavation can also expose unfavorable subsurface soil properties that may reduce soil productivity. These potentially negative impacts would be largely mitigated by implementing range improvement soil and water conservation practices identified as Best Management Practices (BMP).

Range Improvement Effects

Alternative 1: Grazing.

The installation and maintenance of range improvements has the potential to damage the soil resources but these adverse effects would be largely mitigated by implementing Best Management Practices. The disturbance area would be limited in scope as compared to the acreage of the allotment as a whole. Range improvement soil and water conservation practices, identified as 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.

Existing Condition of Watersheds:

The Watershed Condition Classification uses a 12-indicator model to determine watershed condition ratings (Table 11). Indicators act as surrogates, representing the underlying ecological processes that maintain watershed functionality and condition. The 12 indicators are grouped

into four watershed process categories: Aquatic Physical, Aquatic Biological, Terrestrial Physical, and Terrestrial Biological. Each indicator attribute receives a rating. The ratings are expressions of the “best-fit” descriptor of the attribute for the entire 6th-level watershed being classified. The attribute and indicator ratings are as follows (USDA 2011):

- Class 1 = Functioning Properly (Good). Class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.
- Class 2 = Functioning at Risk (Fair). Class 2 watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.
- Class 3 = Impaired Function (Poor). Class 3 watersheds exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition

Watershed condition reflects a range of variability from natural pristine (functioning properly) to a degraded state (severely altered state or impaired) (USDA 2011a). Table 11 displays the existing watershed conditions for the project area.

Table 11. Project area watersheds, along with condition class and total watershed acreage.

5 th level HUC Watershed	6 th level HUC Sub-Watershed	Condition Class	Total Sub-Watershed Acres	Forest Service Sub-Watershed Acres	Smith Canyon and Williamson Valley Allotment Acres
Sycamore Creek	Cottonwood Canyon	At Risk (Fair)	35,842	32,491	28,276
	Smith Canyon	Functioning (Good)	28,202.6	25,791	25,739
Williamson Wash	Hitt Wash	At Risk (Fair)	22,851	17,659.9	4,144
	Horse Wash	At Risk (Fair)	18,178	17,364	13,396
	Humphrey Wash	At Risk (Fair)	11,827	11,590.9	11,826
	Strickland Wash	At Risk (Fair)	15,225	15,225	3,397
	Upper Williamson Valley Wash	At Risk (Fair)	13,355	4,124.4	1,766

Cumulative Effects on Soil Resources and Watershed Condition

Existing conditions and projected direct/indirect effects associated with the soil resources were used in conjunction with the Watershed Condition Classification indicator score to evaluate the cumulative effects of this project upon soil and watershed resources. Past, present, and foreseeable future action(s), regardless of what entity is responsible for the action(s) where considered when evaluating the watershed condition and their associated attributes. Activities that could have additive effects to project actions include vegetation treatments, wildfire, prescribed burning, roads, and grazing. In conclusion, the activities affiliated with the Smith Canyon and Williamson Valley Allotment would not significantly add to the soil and watershed

cumulative effects to the watershed indicators because of the resource protection features and implementation of soil and water conservation practices (BMPs); and the large size of the watershed compared to the small size of the allotment.

Methods to decrease high woody cover in order to improve vegetation structural diversity, increase vegetation ground cover, and improve soil conditions and wildlife habitat include mechanical thinning and fuelwood treatment. Some mechanical treatments and fuelwood practices can cause soil disturbance through soil compaction and displacement, mechanically disturb the soil organic layer, and expose unfavorable subsurface soil properties. This can result in difficulty in re-establishing herbaceous and vegetative ground cover. Current projects and future plans to implement vegetation treatment on the Prescott NF would use hand cutting or tree shears, both of which would minimally disrupt the soil surface. Present and future fuelwood treatments would integrate Best Management Practices to ensure minimal damage to the soil resources. Slash associated with all treatments is retained on the site to stabilize soils and encourage herbaceous cover to mitigate the potential impact of treatment. These treatments may subsequently be maintained through prescribed burning.

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 Burned Area Emergency Response (BAER) program is initiated on all wildfires 500 acres or larger and applies any necessary soil and water conservation treatments to mitigate the threat of accelerated soil loss, water quality/quantity impairment, and loss of life.

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 by concentrating water that may result in soils adjacent to roads to experience gully erosion 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. No proposed road related activities are associated with the proposed action. However, road maintenance associated with range improvement access may occur. Road maintenance measures will be performed using BMP guidelines and will result in a net benefit to road drainage and sedimentation. Upland soil resource activities associated with this project are not expected influence road runoff and sediment process. Hence, no cumulative impacts based on the roads indicator would occur.

Livestock Grazing occurs throughout the cumulative effect subwatersheds. 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 intended to provide for vegetation, soil, and water quantity/quality health.

3.5 What are the Impacts to Water Resources and Riparian Areas?

Hydrology: Perennial stream flow in Arizona is generated mostly by high elevation areas where cool temperatures promote a snowpack and/or there is sufficient precipitation, particularly during cooler seasons, to push a wetting front in the soil column beyond the rooting zone (Winters 2006). Exceptions may be provided by geologic contacts or fault zones, where whatever moisture percolates into the soil substrate and bedrock may be forced up to the surface. Streams typically lose flow downstream in the lower precipitation zones, particularly as they pass onto the thick unconsolidated fans of sediment skirting the mountains or deep valley and basin fill that have high groundwater storage capacity. High intensity rainfall, particularly as associated with the so-called monsoon season may generate a brief period of overland flow and open channel flow in lower elevations where scarce vegetation cover exists (Falconer 2014).

Since occurrence of perennial flow on low order streams below 5,000 foot elevation is largely a matter of geologic control, it presents a seemingly arbitrary nature on the landscape. Statistical treatment of precipitation and streamflow in southeast Arizona indicates that while average annual flow has decreased during the latter part of the 20th century, it cannot be attributed to trends in precipitation, but may be due to substantially increased upland and riparian woody plant species growth (Molnár and Ramirez 2000, Thomas and Pool 2006). This conclusion is supported by the fact that low summer flow accounts for the decrease in total annual flows, while winter flows have shown no statistically significant change.

In the project area, the riparian areas have a somewhat contiguous nature to a few channel systems, but they are not all perennial and the incidence of springs does not always correspond to the larger mapped riparian zones. No systematic review of springs was conducted, and the few observed seemed to take advantage of either a contact between different rock formations—i.e. Section 30 Spring—or simply between flow members of lava rock, such as on the 35 trail in the draw above Jenkins Trap Tank.

All the channels surveyed fall into a general type that does not easily fit classification systems. All were scoured into existing valley fill at some undefined time past and perhaps within the same event or series of events, and then partially filled with material most likely transported as debris flows. This debris has been gradually eroded around and through so the resultant effect is an often multi-threaded channel, not truly a braided one, as the median material size is larger than the stream can transport at average peak flow. Counterpoise to these are sections of stream scoured to bedrock with smooth sides—typical of debris flow passage—looking very much like sledding runs. Frequently debris is deposited in distinct fans downstream.

In all the channels surveyed recent flood flows had overtopped the debris bars, and just as clearly these flows were not capable of transporting the median clast size present. Only evidence for recent movement of sand sized material existed. These reaches were all well vegetated with diverse species and age class, most impressively with woody species. Mature, even quite old appearing stands of ash, willow, walnut or sycamore were present, the particular type maybe more dependent on opportunity than exact habitat.

PFC Surveys

The condition of streams within the allotments is determined through an interdisciplinary team qualitative assessment of condition using the Proper Functioning Condition (PFC) methodology. The team typically consists of a hydrologist, vegetation specialist, ecologist, and wildlife biologist. The PFC method is applicable on streams that are perennial or intermittent in flow. To be intermittent, the stream would have sustained flow for 30 days or more a year.



Photo 11: Cottonwood Creek on the Smith Canyon Allotment. This reach was rated as in Proper Functioning Condition

It is important to note that mature riparian vegetation promotes channel narrowing and habitat diversity even through large floods. Rarely is a robust riparian corridor destroyed by flood waters. In fact, more typically, flooding brings in the finer sediment and organic debris, which when “caught” by existing vegetation, can rapidly change morphology to more mature, stable forms (deeper, narrower cross-sections). Wildfire and, often, subsequent debris-flow originating from hill side draws is one possible scenario that can remove a riparian corridor, massively changing channel/valley morphology, and essentially “resetting” the system.

Table 12. Summary of the riparian reaches that were evaluated as part of this analysis

Allotment	Reach	Condition
Smith Canyon	Cottonwood Creek reach 1	Proper Functioning Condition
	Cottonwood Creek-Spring Site 2	Proper Functioning Condition
	Lower Cottonwood Creek Site 3—Above Corral	Proper Functioning Condition
	Willow Springs (lower Smith Canyon)	Proper Functioning Condition
	Upper Smith Canyon—Site 1	Proper Functioning Condition
	Upper Smith Canyon—Site 2	Proper Functioning Condition
Williamson Valley	Horse Wash Spring	Functioning at Risk – Upward Trend
	Lower Horse Wash	Proper Functioning Condition
	Pine Creek	Proper Functioning Condition
	Hitt Wash	Complex of Proper Functioning and Functioning at Risk

Water Resources Desired Condition and Management Objectives

Specific Forest Plan desired conditions and guidelines relevant to this analysis include:

- Watersheds support sustainable levels of forage for browsing and grazing animals, timber production, and recreation opportunities with no long term decline in watershed conditions. (DC-Watershed-1)
- Natural ecological processes (e.g., periodic flooding and scouring) promote a diverse plant structure necessary for the recruitment of riparian-dependent species. (DC-VEG-23)
- Woody riparian species such as cottonwood, willow, ash, and alder are reproducing with all age classes present. A diverse vegetation structure, including mature trees, snags, logs, and coarse woody debris, is present to provide habitat for riparian-dependent species. (DC-VEG-23)
- Riparian-dependent resources should be managed to maintain and improve productivity and diversity of riparian-dependent species. Riparian communities should provide for the sustainability of aquatic and riparian species. (Guide-WS-3)
- Adverse impacts to stream channel features (e.g., streambanks, obligate riparian vegetation) should be minimized by modifying management actions. Examples of modification could include, but are not limited to: adjusting timing and season of grazing, limiting use and location of heavy machinery, or avoiding placing trails or other recreation structures where recreation use could negatively affect stream channel features. (Guide-WS-4)
- Ground cover sufficient to filter runoff and prevent erosion should be retained in riparian corridors, seeps, and springs. (Guide-WS-5)

Project specific desired conditions:

- 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.

Direct & Indirect Effects on Water Resources:

Alternative 1

Alternative One would continue livestock grazing on the Smith Canyon and Williamson Valley Allotments with design features to meet resource protection needs and meet Forest Plan desired conditions. Adaptive management principles (regular monitoring with appropriate adjustment of timing, intensity, and duration of grazing) will be applied to ensure future compliance. Best Management Practices will be implemented to comply with the Clean Water Act.

Intermittent and perennial flowing riparian areas in the Smith Canyon Allotment were found to be in Proper Functioning Condition (PFC). Within the Williamson Valley Allotment, Pine Creek and Lower Horse Wash were rated as Proper Functioning Condition; Horse Wash Springs and Hitt Wash rated as Functioning at Risk with an upward trend. The management objective for both is to encourage vegetation on stream banks to improve the stability and achieve PFC.

Where riparian vegetation and conditions exist around developed springs it will be evaluated to determine if desired conditions for groundwater dependent ecosystems are being met, given the existing livestock uses. Where desired conditions are not being met, and can be attributed to livestock management, future practice may be to protect the vegetated area by fencing, and provide livestock water by pipeline and trough outside the fenced area.

Directly, cattle grazing can affect vegetation biomass, structure and composition (Belsky and Blumenthal 1997). The degree of these effects will depend upon grazing intensity. This project proposes to retain 55-65% of herbaceous biomass in uplands, and 70-85% in areas of degraded soil condition. Water quality may also be affected, factors such as temperature and dissolved oxygen and pathogens, although water quality impacts such as nitrogen loading and pathogens are highly dependent on timing of livestock rotation and runoff events (Nader et al 1998, Edwards et al 2000). Because grazing will be managed by the application of allowable use levels in riparian areas, it is expected that there would be general improvement in channel and meadow morphology. PFC surveys found perennial and intermittent riparian reaches as Proper Functioning or trending towards this designation. Monitoring and adaptive management would be employed so that management objectives can be achieved in those areas needing improvement. Desired conditions as outlined in the Forest Plan are judged being met with possible exception of short-term exceedance of water quality standards for turbidity, due to some unsatisfactory upland soil conditions that are unlikely to change in some areas as explained in the soil effects section.

Meeting Desired Forest Plan Conditions

Alternative One would meet the requirements of desired conditions for watersheds, in part because it is determined that grazing, at the current numbers, does not exert morphologic change, which is a function of infrequent storms, and probably in many reaches associated debris flows.

Cumulative Effects-Meeting Conditions of Clean Water Act

Grazing has been conducted continuously since the early 20th century on the Smith Canyon allotment. Livestock numbers have been reduced from 549 head to the 296 yearlong currently. Prescribed fire has been used to reduce chaparral and promote grass; 8,650 acres 1982 to 1989 across five pastures. Firewood cutting was allowed 1982 to 1984 in Spider and Jones pastures. Eight hundred (800) acres was treated to reduce juniper, by hand felling on Smith Mesa, 2012-2013.

Williamson Valley allotment has had grazing since at least 1931. In the 1960s, following analysis of range condition, livestock numbers were reduced from 490 head to the 300 permitted currently. From 1972 to 2009 over 22,000 acres were treated by fire, either as an under-burn in forested areas, or as reduction of chaparral both in order to promote grasses. Some minor vegetation manipulation has occurred: a 50 acre timber sale in Camp Wood Pasture in 1979, and 63 acres of juniper thinning in Tailholt pasture in 1999.

No streams emanating directly from the project area are listed on the 303 (d) list for water quality impairments as required by the Clean Water Act. Pine Creek and Cottonwood Canyon are noted for attaining all beneficial uses. Approximately the east half of the allotments drain into the Verde River watershed, and the west half into Santa Maria River, tributary to the Bill Williams River. Impairments to the Santa Maria, not influenced by the allotments area, are water quality exceedances of heavy metals: arsenic, copper and zinc. Typical impacts to water quality from livestock are different categories of pollutants—turbidity, decreased dissolved oxygen,

increased temperature, fecal coliform content—than what are listed for the impaired reach on the Santa Maria River. There is a Total Maximum Daily Load limit for turbidity on the Verde River in the reach below Camp Verde, 50 miles downstream of the Forest and allotment boundaries (ADEQ 2001). Reasons for turbidity are given as juniper and shrub growth that are inhibiting grasses in the area contributing to the main stem of the Verde River in a reach of about 37 miles from confluence with Sycamore Creek and a point downstream of Camp Verde. It is by no means certain that impacts from grazing in the allotments would affect downstream conditions below Sycamore Creek, nor be differentiated from effects of the considerable private land, highway crossings, and urbanized tracts that are between the Forest boundary and Sycamore Creek. Therefore no cumulative impacts from the project area are anticipated to this reach on the Verde River.

Alternative 2—No Grazing Option Direct, Indirect and Cumulative Effects

Under this alternative, grazing permits would be cancelled. Improvements described under the Proposed Action would not be necessary. The elimination of grazing would have effects to riparian condition and water quality over a period greater than 5 or 10 years. Riparian, perennial reaches are marked by infrequent scour and deposition, probably caused by associative events such as wildfire and subsequent hillslope erosion. Bedrock and large cobble to boulder substrates predominate in channel and floodplains. It is unlikely that these events or their magnitude will be affected by elimination of grazing. Few riparian reaches have banks and floodplains primarily composed of fine grain materials, gravel, and sand size or smaller portions. Soil horizons do exist, though rather sporadically, on upper floodplain/terraces on lower Smith Canyon and Pine Creek. Compaction in sandy soil is usually not significant, but where silty loamy or finer soil textures exist, de-compaction resulting from elimination of grazing may be a long term effect, spread out over decades. Increases or re-population of banks by obligate woody riparian species may occur over time, concomitant with soil moisture conditions and seed source, and elimination of pressure from livestock, though browse from wildlife may increase. Therefore appreciable improvements to water quality may be quite slow.

3.6 What are the Impacts to Wildlife, Aquatic Species, and Rare Plants?

The Wildlife, Fish, and Rare Plant Specialist Reports (project record) serves as the Biological Assessment and Evaluation that documents the effects of the action alternatives and the no action alternative on plant and animal species and habitat that have the following status: federally listed under ESA (Endangered Species Act), any designated or proposed critical habitat under ESA, and USDA Forest Service Region 3 sensitive species. This report also documents the effects of the alternatives on Prescott National Forest Management Indicator Species (MIS), and species under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act.

The best available science was used in the completion of this report. Upon review of PNF habitat data, it was determined that federally listed species under the ESA do not occur in the project area.

Wildlife

Smith Canyon Allotment Affected Environment

Vegetation on the allotment consists primarily of piñon-juniper evergreen shrub (60%) and interior chaparral (26%), with twelve percent considered juniper grassland. Canopy cover from shrub species is moderately to extremely thick in some locations to the extent that herbaceous

forage is reduced or absent. A portion of the forage base of the allotment is provided by browse species such as turbinella oak with mountain mahogany, deerbrush, and skunkbush in smaller quantities. Perennial grasses can be locally abundant, especially in juniper woodlands that have been previously thinned, and south aspects. Big game hunting opportunities exist for deer, elk, bear, turkey, and javelina.

Endangered Species Act (ESA):

Thirteen species listed by the US Fish and Wildlife Service under the ESA were assessed and only the roundtail chub (RTC) is known to occur within the Smith Canyon Allotment or have habitat on or near the allotment. The species was detected during surveys in 2012 (AZGFD 2012) and additional habitat within the allotment was identified as being suitable for introduction of the species. The habitat includes Cottonwood Canyon and is divided by natural barriers within the stream course. RTC are known to occur within about 1 mile of habitat on the southwest corner of the allotment in the Smith Canyon Pasture. They do not occur above a natural barrier in the stream course, and more importantly, neither do any non-native fish; making Cottonwood Canyon an ideal location for putting native RTC. The habitat within the stream course is rocky and filled with large boulders.

Bald and Golden Eagle Protection Act:

Bald eagles are not known to nest within the project area. They may use the area during the winter and forage on gut piles during hunting season.

Two golden eagle nest sites are known to occur inside the allotment; one is on BT Butte in the northwest portion of the allotment in Cottonwood Pasture and one on the tip of a mesa in the southeast part of Smith Canyon. One more structure is on the southern boundary of the allotment on the north side of Sycamore Mesa. Two more occur on the west boundary of the allotment on the edge of South Mesa. Considering that golden eagles can have a territory that ranges from 2 to 80 square miles based on the availability of prey, these nests could belong to one or possibly two different pairs of golden eagles. Golden eagles primarily forage on jack rabbits and similarly sized prey items.

Migratory Bird Treaty Act:

With several different vegetation types occurring within the project area, 16 of the 47 species of migratory birds considered might be expected to occur within the project area. One species is a cliff nester, while the remaining species nest in some sort of vegetation substrate. Food sources range from small mammals to insects or seeds and berries.

Southwestern Region 3, Regional Forester's sensitive species:

Lowland leopard frogs are known to occur in the allotment in pools and perennial reaches in Cottonwood Creek. Sonoran suckers are known to occur in Cottonwood Creek (AZGFD 2012). Cottonwood Creek has been determined to be suitable for introducing native desert suckers as well. A species of caddis fly identified as sensitive may be expected to occur within the perennial reaches of Cottonwood Creek.

Two sensitive plants are known to occur within the allotment (Baker and Wright 1994). Eastwood alumroot grows on moist slopes in ponderosa pine forests or canyons and is known to occur within the Cottonwood pasture. Arizona phlox grows on open exposed limestone-rocky slopes within piñon-juniper woodlands or ponderosa pine-gambel oak woodlands and is also known to occur in the Cottonwood Pasture. Broad-leafed lupine occurs within riparian corridors adjacent to the allotment and would be expected to occur in riparian corridors within the allotment along Cottonwood Creek.

Management Indicator Species:

Northern goshawks are the management indicator species for the 156 acres of ponderosa pine PNVTs. Pronghorn are the MIS for the 5,759 acres of grassland PNVTs. Aquatic macroinvertebrates are the MIS for 5.5 miles of perennial waters in the project area.

Environmental Effects for the Smith Canyon Allotment

Endangered Species Act:

Alternative 1 - Grazing:

The only species known to occur within the project area is the round-tail chub (RTC). The species was detected during surveys in 2012 (AZGFD 2012) and additional habitat within the allotment was identified as being suitable for introduction of the species. The habitat includes Cottonwood Canyon and is divided by natural barriers within the stream course. RTC are known to occur within about 1 mile of habitat on the southwest corner of the allotment in the Smith Canyon Pasture. They do not occur above a natural barrier in the stream course, and more importantly, neither do any non-native fish; making Cottonwood Canyon an ideal location for putting native RTC.

The habitat within the stream course is rocky and filled with large boulders. Cattle do not typically enter the stream course where the RTC occur and where AZGFD have proposed to put the fish above the natural barrier. Livestock grazing has been ongoing in the area since 1941. The habitat was assessed in the presence of the current ongoing livestock grazing and the report contains no mention of any concerns or negative habitat impacts from the livestock grazing to the fish habitat (AZGFD 2012).

Livestock would not be expected to enter the areas proposed for putting RTC in Cottonwood Canyon. On the remote chance that a cow did get into the stream course in Cottonwood Canyon, it would be highly unlikely for a cow to encounter a fish given the rocky nature of the stream habitat. The current grazing regime is providing quality habitat for RTC in the occupied and suitable reaches within the allotment. This is a site specific deviation from the Southwestern Region 3 Programmatic Framework for Streamlining Consultation on Livestock Grazing Activities (USFS 2015).

Alternative 2 – No Grazing:

For the No Action alternative, with no livestock in the allotment, there would not be any anticipated effects to RTC from this alternative.

Bald and Golden Eagle Protection Act:

Alternative 1:

Livestock grazing and associated activities that occur away from known nest sites would not be expected to disturb or impact nesting golden eagles. Considering the usual nest locations on rock ledges, livestock management activities are not likely to impact nesting golden eagles.

Two proposed range improvements occur near enough known golden eagle nest sites to warrant some survey for golden eagle occupancy prior to starting any disturbing activities near the nest sites. The drift fence in Granites Pasture and the water development in the southern portion of Smith Canyon Pasture are close enough to known golden eagle nest sites to potentially cause disturbance to nesting eagles during the construction phases of the projects. A breeding season timing restriction (January-June) or design modification of the project including access or location may be necessary to eliminate any take of eagles under the Act. It is not

expected that the final structures would have any impacts to the nesting and foraging golden eagles that may use the area. With these design considerations in place, no disturbance to nesting eagles would be expected to occur and thus, no take.

Livestock grazing as proposed would be expected to maintain or improve the physical structure of habitat for prey species, and therefore it would not be expected to have a discernible impact on the quantity or quality of the habitat or the corresponding prey species population. Therefore, there would not be any disturbance to feeding behavior and thus, no take.

Alternative 2 – no grazing:

With no actions occurring within the project area, this alternative would not result in “take” of any bald or golden eagles.

Migratory Bird Treaty Act:

Based on the vegetation types within the project area, 16 species might be expected to occur.

- Riparian – common black hawk, yellow warbler, Lawrence’s goldfinch
 - Project is expected to maintain or improve riparian habitat quality thus providing for nesting and foraging habitat for these species. Proposed water developments in the uplands will alleviate cattle watering in riparian areas and relying solely on springs for water, thus improving riparian associated vegetation and habitat.
- Grassland habitat – Swainson’s hawk, ferruginous hawk
 - The two hawks in this type nest in tree structures that would not be impacted by this project. While ferruginous hawks primarily prey on prairie dogs, Swainson’s prey on small mammals, reptiles, and other food sources when raising their young. The project would continue to provide ample habitat for all of these prey species.
- Ponderosa pine/evergreen or Gambel oak – flammulated owl
- Piñon-juniper, chaparral, woodlands – gray flycatcher, gray vireo, piñon jay
- Piñon-juniper & chaparral - black-chinned sparrow, black-throated gray warbler, canyon towhee
- Chaparral or woodlands – band-tailed pigeon, phainopepla, Virginia’s warbler,
 - Tree and shrub structures in these vegetation types would not be impacted, thus providing nesting substrate including cavities and food items including nuts, seeds, and berries. Understory vegetation would be maintained or improved to provide for insect prey species habitat.
- Cliffs – prairie falcon
 - There would be not impacts to nesting habitat and the habitat for small mammals would continue to be maintained or improved under this project.

The nearest Important Bird Area would be the Upper Verde River IBA, which is over 20 miles away and would not be impacted by this project in any way.

Alternative 1: This alternative would not have any impacts under the MBTA.

Alternative 2 - No Action: This alternative would not have any impacts under the MBTA.

R3 Regional Forester’s sensitive species:

Lowland leopard frog:

Alternative 1 - Grazing :

- Unless cattle step on a frog or their eggs, no other direct effects would be expected from this project. Overall, the quality of the riparian habitat is expected to be maintained or improved through this project. Proposed water developments in the uplands will alleviate

cattle watering in riparian areas and relying solely on springs for water, thus improving riparian associated vegetation and habitat used by LLF and their prey. There are no projects that have specifically contributed to improving riparian or aquatic habitat in the project area, therefore this project does not contribute to any cumulative effects.

Alternative 2 – No Grazing:

- With no livestock grazing, there would not be any direct effects from this alternative. With no livestock grazing, indirect effects from this alternative would be that quality of riparian vegetation and associated aquatic habitat would improve more quickly than with the action alternative. Because there would be no negative effects, there would be nothing to add to cumulative impacts.

Sonoran sucker:

Alternative 1 - Grazing:

- Unless cattle step on a fish or their eggs, no other direct effects would be expected from this project. Overall, the quality of the aquatic habitat is expected to be maintained or improved through this project. Proposed water developments in the uplands will alleviate cattle watering in riparian areas and relying solely on springs for water, thus improving riparian vegetation and associated aquatic habitat. There are no projects that have specifically contributed to improving riparian or aquatic habitat in the project area, therefore this project does not contribute to any cumulative effects.

Alternative 2 – No Grazing:

- With no livestock grazing, there would not be any direct effects from this alternative. With no livestock grazing, indirect effects from this alternative would be improved quality of riparian vegetation and associated aquatic habitat.

Desert sucker:

Alternative 1 - Grazing:

- Unless cattle step on a fish or their eggs, no other direct effects would be expected from this project. Overall, the quality of the aquatic habitat is expected to be maintained or improved through this project. Proposed water developments in the uplands will alleviate cattle watering in riparian areas and relying solely on springs for water, thus improving riparian vegetation and associated aquatic habitat. There are no projects that have specifically contributed to improving riparian or aquatic habitat in the project area, therefore this project does not contribute to any cumulative effects.

Alternative 2 – No Grazing:

- With no livestock grazing, there would not be any direct effects from this alternative. With no livestock grazing, indirect effects from this alternative would be improved quality of riparian vegetation and associated aquatic habitat..

A caddis fly:

Alternative 1 - Grazing:

- Unless cattle step on a caddis fly larvae, no other direct effects would be expected from this project. Overall, the quality of the aquatic habitat is expected to be maintained or improved through this project. Proposed water developments in the uplands will alleviate cattle watering in riparian areas and relying solely on springs for water, thus improving riparian vegetation and associated aquatic habitat. There are no projects that have specifically contributed to improving riparian or aquatic habitat in the project area, therefore this project does not contribute to any cumulative effects.

Alternative 2 – No Grazing:

- With no livestock grazing, there would not be any direct effects from this alternative. With no livestock grazing, indirect effects from this alternative would be improved quality of riparian vegetation and associated aquatic habitat.

Eastwood alumroot:

Alternative 1 - Grazing:

- This species was detected in one location within the allotment (Baker and Wright 1994). Cattle may use the area where the plant is known to occur. Some herbivory on individuals within the population may occur. Because it occurs on slopes, cattle do not normally spend a lot of time in or on the species' habitat. Prescribed burns in the area may have had some short term negative effects to the plants in the allotment. Because the species occurs in the fire-adapted ponderosa pine ecosystem, these impacts would be considered to be a natural disturbance. Fires likely had very little, only short-term impact on the species, and therefore nothing to add to the cumulative impacts.

Alternative 2 – No Grazing:

- With no livestock grazing in this alternative, there would not be any direct or indirect effects to individuals, population or the species from this alternative. With no direct or indirect effects from this alternative, this alternative does not contribute to any cumulative effects for this species.

Broad-leafed lupine:

Alternative 1 - Grazing:

- Livestock presence and utilization within riparian corridors could lead to direct effects including herbivory or trampling of individuals within populations. With overall objectives to maintain or improve riparian vegetation, indirectly, the habitat for the species would be expected to improve over time. Proposed water developments in the uplands will alleviate cattle watering in riparian areas and relying solely on springs for water, thus improving riparian associated vegetation and habitat for the species.

Alternative 2 – No Grazing:

- With no livestock grazing, there would not be any direct effects from this alternative. With no livestock grazing, indirect effects from this alternative would be that quality of riparian vegetation and habitat would improve more quickly than the action alternative. There would be no negative impacts to contribute to cumulative effects.

Arizona phlox:

Alternative 1 - Grazing:

- Open exposed limestone shelves are not the preferred areas for livestock grazing. Therefore, any direct or indirect effects to individual plants would be highly unlikely to occur. Herbivory or trampling of individual plants could occur as livestock passed through an area. There are no known projects impacting the vegetation on open exposed limestone shelves. Therefore, this project would not contribute to any cumulative effects for this species.

Alternative 2 – No Grazing:

- With no livestock grazing in this alternative, there would not be any direct or indirect effects to individuals, population or the species from this alternative. With no direct or indirect effects from this alternative, this alternative does not contribute to any cumulative effects for this species.

Management indicator species:

With less than 3% of any given indicator habitat for MIS, any impacts from the project are on such small scale relative to the forest habitat as to be indiscernible for all of the MIS habitat and population trends.

Williamson Valley Allotment Affected Environment

Vegetation on the allotment consists of 60% Piñon-juniper evergreen shrub and 21% Interior Chaparral, with lesser amounts of Ponderosa Pine (12%), Juniper Grasslands (4%), and Riparian (2%) vegetation occurring. Canopy cover from shrub species is moderately to extremely thick in some locations to the extent that herbaceous forage is reduced or absent. A portion of the forage base of the allotment is provided by browse species such as turbinella oak with mountain mahogany, deerbrush, and skunkbush found in smaller quantities. Perennial grasses can be locally abundant, especially in juniper woodlands that have been previously thinned, and south aspects. The allotment supports a variety of big game species including deer, javelina, elk, and turkey. Large predators such as coyote, mountain lion, bobcat, and black bears can also occur.

Endangered Species Act (ESA):

Thirteen species listed by the US Fish and Wildlife Service under the ESA were assessed and none are known to occur within the Williamson Valley Allotment or have habitat on or near the allotment.

Bald and Golden Eagle Protection Act:

Bald eagles are not known to nest within the project area. They may use the area during the winter and forage on gut piles during hunting season.

One golden eagle nest site is known on the boundary of the allotment in the northwest corner on Camp Wood Mountain. There is a nest site north of the allotment 2.25 miles on Granite Knob. BT Butte has a golden eagle nest site 0.8 miles south of the allotment. Two golden eagle nest sites are on the south tip of South Mesa just over 2 miles from the allotment boundary. Considering that golden eagles can have a territory that ranges from 2 to 80 square miles based on the availability of prey, these nests could belong to one or possibly two different pairs of golden eagles.

Migratory Bird Treaty Act:

With several different vegetation types occurring within the project area, 15 of the 47 species of migratory birds considered might be expected to occur within the project area. One species is a cliff nester, while the remaining species nest in some sort of vegetation substrate. Food sources range from small mammals to insects or seeds and berries.

Southwestern Region 3, Regional Forester's sensitive species:

Most of the historic Camp Wood northern goshawk PFA (post-fledging family area) occurs in the north central portion of the allotment in the Camp Wood and Brushy pastures. This territory has long been abandoned due to the intense recreational use during the summer in the center of the PFA. A minute portion of the Seven-Up PFA occurs on the western edge of the allotment. This does not include any of the nest stands.

Lowland leopard frogs are known to occur in the adjacent Smith Canyon allotment and could occur in pools or perennial reaches within the allotment.

Three sensitive plants are known to occur within the allotment (Baker and Wright 1994). Eastwood alumroot grows on moist slopes in ponderosa pine forests or canyons and is known to occur within the Camp Wood pasture and within the area for a proposed new water development. Broad-leaved lupine occurs within riparian corridors and is known to occur in several locations within the project area including Camp Wood, Stinson, Cottonwood, and Burnt Pastures. Arizona phlox grows on open exposed limestone-rocky slopes within piñon-juniper woodlands or ponderosa pine-Gambel oak woodlands and is known to occur in the Camp Wood and Humphrey's Pastures.

Management Indicator Species:

Northern goshawks are the management indicator species for the 6,143 acres of ponderosa pine PNVTs. Pronghorn are the MIS for the 2,052 acres of grassland PNVTs. Aquatic macroinvertebrates are the MIS for perennial waters of which there are none in the project area.

Environmental Effects for the Williamson Valley Allotment

Endangered Species Act: With no species and no habitats within or near the project area, there would not be any effects from this project to any federally listed species or habitats.

Bald and Golden Eagle Protection Act:

Alternative 1 - Grazing: Livestock grazing and associated activities that occur away from known nest sites would not be expected to disturb or impact nesting golden eagles. Considering the usual nest locations on rock ledges, livestock management activities are not likely to impact nesting golden eagles. Therefore, no disturbance to nesting would be expected to occur and thus, no take.

Livestock grazing would not be expected to discernibly change the physical structure of habitat for prey species, and therefore it would not be expected to have a discernible impact on the quantity or quality of the habitat or the corresponding prey species population. Therefore, there would not be any disturbance to feeding behavior and thus, no take.

Alternative 2 – No Grazing: With no actions occurring within the project area, this alternative would not result in “take” of any bald or golden eagles.

Migratory Bird Treaty Act:

Based on the vegetation types within the allotment, 15 species might be expected to occur.

- Riparian – common black hawk, yellow warbler, Lawrence's goldfinch
 - Project is expected to maintain or improve riparian habitat quality thus providing for nesting and foraging habitat for these species. Proposed water developments in the uplands will alleviate cattle watering in riparian areas and relying solely on springs for water, thus improving riparian associated vegetation and habitat.
- Grassland habitat – Swainson's hawk, ferruginous hawk
 - The two hawks in this type nest in tree structures that would not be impacted by this project. While ferruginous hawks primarily prey on prairie dogs, Swainson's prey on small mammals, reptiles, and other food sources when raising their young. The project would continue to provide ample habitat for all of these prey species.
- Piñon-juniper, Chaparral, Woodlands – gray flycatcher, gray vireo, piñon jay
- PJ & Chaparral - black-chinned sparrow, black-throated gray warbler, canyon towhee
- Chaparral or woodlands – band-tailed pigeon, phainopepla, Virginia's warbler,

- Tree and shrub structures in these vegetation types would not be impacted, thus providing nesting substrate and food items including nuts, seeds, and berries. Understory vegetation would be maintained or improved to provide for insect prey species habitat.
- Cliffs – prairie falcon
 - There would be not impacts to nesting habitat and the habitat for small mammals would continue to be maintained or improved under this project.

The nearest Important Bird Area would be the Upper Verde River IBA, which is over 20 miles away and would not be impacted by this project in any way.

Alternative 1 - Grazing: This alternative would not have any impacts under the MBTA.

Alternative 2 - NoGrazing: This alternative would not have any impacts under the MBTA.

R3 Regional Forester's sensitive species:

Northern goshawk:

Alternative 1 – Grazing:

- No direct effects would be expected from livestock grazing activities within the allotment. With maintained or improved vegetative conditions on the uplands, improved prey species habitat would provide higher quality foraging habitat for northern goshawks that may use the allotment. None of the proposed range improvements would be expected to have a discernible impact to northern goshawks. Recent vegetation treatments including prescribed fire have improved prey species habitat and thus northern goshawk foraging habitat. Because there are no negative impacts from the proposed action, this project would not contribute to cumulative effects for the northern goshawk.

No Action:

- With no livestock grazing or associated activities, there would be an expected improvement in the quality of vegetation on the upland providing improved quality prey species habitat and thus foraging habitat for the northern goshawks that may use the area. Recent vegetation treatments including prescribed fire have improved upland vegetation and thus prey species habitat and in turn northern goshawk foraging habitat..

Lowland leopard frog:

Alternative 1 – Grazing:

- Unless cattle step on a frog or their eggs, no other direct effects would be expected from this project. Overall, the quality of the riparian habitat is expected to be maintained or improved through this project. Proposed water developments in the uplands will alleviate cattle watering in riparian areas and relying solely on springs for water, thus improving riparian associated vegetation and habitat. Because there are no notable negative impacts from this proposal, there would be nothing to add to cumulative effects.

Alternative 2 - No Grazing:

- With no livestock grazing, there would not be any direct effects from this alternative. With no livestock grazing, indirect effects from this alternative would be improved quality of riparian vegetation and associated aquatic habitat. There are no projects that have specifically contributed to improving riparian or aquatic habitat in the project area, therefore there are no cumulative effects from this project.

Eastwood alumroot:

Alternative 1 - Grazing:

- This species was detected in one location within the allotment (Baker and Wright 1994). Cattle may use the area where the plant is known to occur. Some herbivory on

individuals within the population may occur. Because it occurs on slopes, cattle do not normally spend a lot of time in or on the species' habitat. Surveys to identify the extent of the population would occur prior to finalizing the proposed water development location in order to avoid the alumroot population. Prescribed burns in the area may have had some short term negative effects to the plants in the allotment. Because the species occurs in the fire-adapted ponderosa pine ecosystem, these impacts would be considered to be a natural disturbance. Because there are no notable negative impacts from the proposed action, there would be nothing to add to cumulative effects.

Alternative 2 – No Grazing:

- With no livestock grazing in this alternative, there would not be any direct or indirect effects to individuals, population or the species from this alternative. With no direct or indirect effects from this alternative, this alternative does not contribute to any cumulative effects for this species.

Broad-leafed lupine:

Alternative 1 – Grazing:

- Livestock presence and utilization within riparian corridors could lead to direct effects including herbivory or trampling of individuals within populations. With overall objectives to maintain or improve riparian vegetation, indirectly, the habitat for the species would be expected to improve over time. Proposed water developments in the uplands will alleviate cattle watering in riparian areas and relying solely on springs for water, thus improving riparian associated vegetation and habitat for the species.

Alternative 2 – No Grazing:

- With no livestock grazing, there would not be any direct effects from this alternative. With no livestock grazing, indirect effects from this alternative would be improved quality of riparian vegetation and habitat.

Arizona phlox:

Alternative 1 - Grazing:

- Open exposed limestone shelves are not the preferred areas for livestock grazing. Therefore, any direct or indirect effects to individual plants would be highly unlikely to occur. Herbivory or trampling of individual plants could occur as livestock pass through an area. There are no known projects impacting the vegetation on open exposed limestone shelves, therefore, this project would not contribute to any cumulative effects for this species.

Alternative 2 – No Grazing:

- With no livestock grazing in this alternative, there would not be any direct or indirect effects to individuals, population or the species from this alternative. With no direct or indirect effects from this alternative, this alternative does not contribute to any cumulative effects for this species.

Management indicator species:

The impacts to grassland PNVT habitat from the project are on such small scale relative to the forest habitat as to be indiscernible for the pronghorn habitat and population trends. No changes are expected in the indicator habitat for the northern goshawk from either alternative, thus no changes in habitat or population trends as well.

3.7 What are the Impacts to Recreational Activities?

Existing Condition:

Recreation activity in the project area is primarily associated with hunting, wood-gathering, and off-highway vehicle use. There are no developed campgrounds or picnic areas on the allotments. Roads on the allotments may be used for scenic driving, although motorized travel

must be on designated roads only (CFR 261.13). Dispersed camping can occur within 300 feet of a road that is open to motorized travel.

Hunting activity is heaviest during the fall, with big game hunting opportunities for deer, elk, bear, and javelina. Wood cutters and people riding ATVs utilize the project area. Recreational opportunities such as dispersed camping, hiking, biking, horseback riding, and driving are more prevalent in the spring and fall season than in the hot summer months. A review of the Prescott NF records did not reveal the presence of any research natural areas within the project area. There are no Wild and Scenic Rivers within or near these two allotments..

Inventoried Roadless Area

Inventoried Roadless Areas (IRA's) are a group of National Forest System lands that were previously identified by government reviews as lands without existing roads that could be suitable for Roadless Area Conservation (Roadless Area Conservation is a conservation policy limiting road construction and tree cutting). A review of the Prescott National Forest Inventoried Roadless Areas (IRAs) shows that about 2/3 of Connell Mountains IRA is in the Williamson Valley Allotment and a large part of Sheridan Mountain IRA is in the Smith Canyon Allotment and a very small portion of this IRA goes into the Williamson Valley Allotment. There are no road construction activities proposed for Alternative 1.

Direct & Indirect Effects on Recreation:

Alternative 1 –Grazing

Recreationists, woodcutters, and hunters may encounter cattle but the presence of cattle and livestock grazing does not preclude or prevent recreational opportunities within the project area. Public perceptions of cattle grazing may affect an individual's recreational experience within the project area, but this is difficult to assess due to the wide range of public opinion on grazing on public lands. Continuation of livestock grazing within the project area will have minimal effect on the recreational experience of Forest users. There are no records of complaints and/or negative experiences concerning interactions with livestock from recreationists in this area.

Alternative 2 – No Action/No Grazing

Under this alternative, grazing would no longer occur in the project area. Most recreationists involved with various recreational activities (camping, hiking, biking, horseback riding, recreational driving in authorized areas and other recreation activities) would not notice a difference if cattle were no longer on the allotments.

Cumulative Effects on Recreation Resources

The cumulative effects area for recreation is the project area only. Because there would be no negative impacts or changes to recreation resources by re-authorizing grazing on the allotments, there would be no cumulative impacts to this resource from reauthorizing grazing.

3.8 What are the Impacts to Heritage Resources?

Existing Condition:

Based on an examination of the Prescott National Forest (PNF) heritage resource atlas, records, and files, the following surveys, reviews, and investigations have occurred within the allotments and have resulted in the identification and documentation of heritage resources. The heritage reports and site forms are on file in the Forest Heritage Resource Section at the PNF Supervisor's Office.

Smith Canyon

Since 1989, nineteen heritage projects have been conducted within the Smith Canyon Allotment that meet the current heritage standards for archaeological investigations on the PNF. The 19 projects were conducted for range improvements (7), trail maintenance and realignment (5), prescribed burning (1), road maintenance (1), juniper thinning (1), mining exploration (1), landscape rock collecting (1), illegal wood cutting (1), and heritage resource management (1). These projects intensively examined a total of 346 acres. Prior to 1989, ten projects were conducted, but these projects do not meet the PNF's heritage survey standards for archaeological investigations and the acres will not be included in this analysis. Since 1973, a total of 57 heritage resource sites (fifty-six prehistoric sites and one historic site) have been documented within the allotment by either PNF heritage specialists, para-archaeologists, or avocational archaeologists. The PNF consulted with the AZ State Historic Preservation Office (SHPO) and 3 of the prehistoric sites are eligible for the National Register of Historic Places (NRHP). While the other 53 prehistoric sites and the 1 historic site are unevaluated for the NRHP but they will be treated as eligible until a formal determination can be made.

Williamson Valley

Since 1989, thirty-nine heritage projects have been conducted within the Williamson Valley Allotment that meet the current heritage standards for archaeological investigations on the PNF. The 39 projects were conducted for range improvements (10), road maintenance (7), special uses (7), prescribed burning and wildfire (4), heritage resource management (4), trail maintenance (3), juniper thinning (1), fuelwood harvesting (1), illegal wood cutting (1), and a telecommunication line (1). These projects intensively examined a total of 609 acres. Prior to 1989, twenty-six projects were conducted but these projects do not meet the PNF's heritage survey standards for archaeological investigations and the acres will not be included in this analysis. Since 1970, a total of 97 cultural resource sites (88 prehistoric sites, 6 historic sites, and 3 multicomponent sites) have been documented within the allotment by either PNF heritage specialists, para-archaeologists, or avocational archaeologists. The PNF consulted with the AZ State Historic Preservation Office (SHPO) and 15 of the prehistoric sites, 1 of the historic sites, and 1 of the multicomponent sites are eligible for the National Register of Historic Places (NRHP). While the other 73 prehistoric sites, 4 of the historic sites, and 2 of the multicomponent sites are unevaluated for the NRHP but they will be treated as eligible until a formal determination can be made. Only 1 historic site was determined not eligible for the NRHP in consultation with the SHPO.

Direct & Indirect Effects on Heritage Resources:

Alternative 1 - Grazing

It has been documented in the PNF range files that the 2 allotments on the Chino Valley Ranger District have been grazed by livestock for over 75 years and at numbers higher than present levels. The Williamson Valley allotment was once part of much larger allotment but was split off in the 1930s and the Smith Canyon allotment was created from another allotment in the 1940s and later consolidated with several allotments in the 1960s. Prior to the establishment of the PNF in 1908, Euro American settlers had established homesteads and ranches and were grazing livestock throughout the area. The alternative doesn't propose grazing at a higher intensity than previous years for either allotment. As such, it is not expected that grazing impacts to heritage resources by possible livestock trampling will increase. New range improvements described for Alternative 1 that will be implemented within the next 2 years will be surveyed for cultural resources and reports will be completed prior to the signing of the decision. If cultural resource sites are located, project activities will avoid the sites or, if necessary, the project will be relocated in order to avoid the sites.

In the future, when additional range improvements or other ground disturbing management practices are needed, the PNF 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 National Historic Preservation Act.

Cumulative Effects of Alternative 1

Past, present, and reasonably foreseeable future actions on the 2 allotments 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 cultural 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 cultural resource sites. Since no direct or indirect effects are anticipated, there would be no cumulative effects.

4. Coordination and Agencies Consulted_____

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) at <http://www.fs.fed.us/sopa/> beginning in December of 2015. A scoping letter dated 1/19/2016 describing the proposal for grazing management was sent to the permit holders of the allotments, 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.

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, and 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. Entities that file specific comments as defined in 36 CFR 218.2 also provide the commenter with standing to file an objection.

The responses received during the public scoping period did not raise concerns that would not be addressed through project design, including resource protection measures and incorporation of Best Management Practices, and following the standards and guidelines of the Prescott Forest Plan.

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

Individuals/Groups

Permittees – Smith Canyon
Williamson Valley, K Four,
Stephens, Quartz Wash, Hitt Wash,
Yolo South, Old Camp, Walnut
Creek, Camp Wood, Tank Creek
Back Country Horsemen
Center for Biological Diversity
Erik Ryberg
Friends of Anderson Mesa
Jeff Burgess
Sierra Club – Yavapai Group
The Nature Conservancy
The Wilderness Society
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

Core Interdisciplinary Team Members

Christine Thiel, ID Team Leader/
Writer / Editor
David Moore, Forest Soil Scientist
Eric Moser, Enterprise Team
Hydrologist
Francisco Anaya, Ecologist
John Kava, Rangeland Management
Specialist

Extended Team Members

Albert Sillas, Aquatic Biologist
Dorothy Baxter, Recreation Planner
Elaine Zamora, Archeologist
Jim Gilsdorf, Chino Valley District
Ranger
Noel Fletcher, Wildlife Biologist
Thomas Potter, GIS Coordinator

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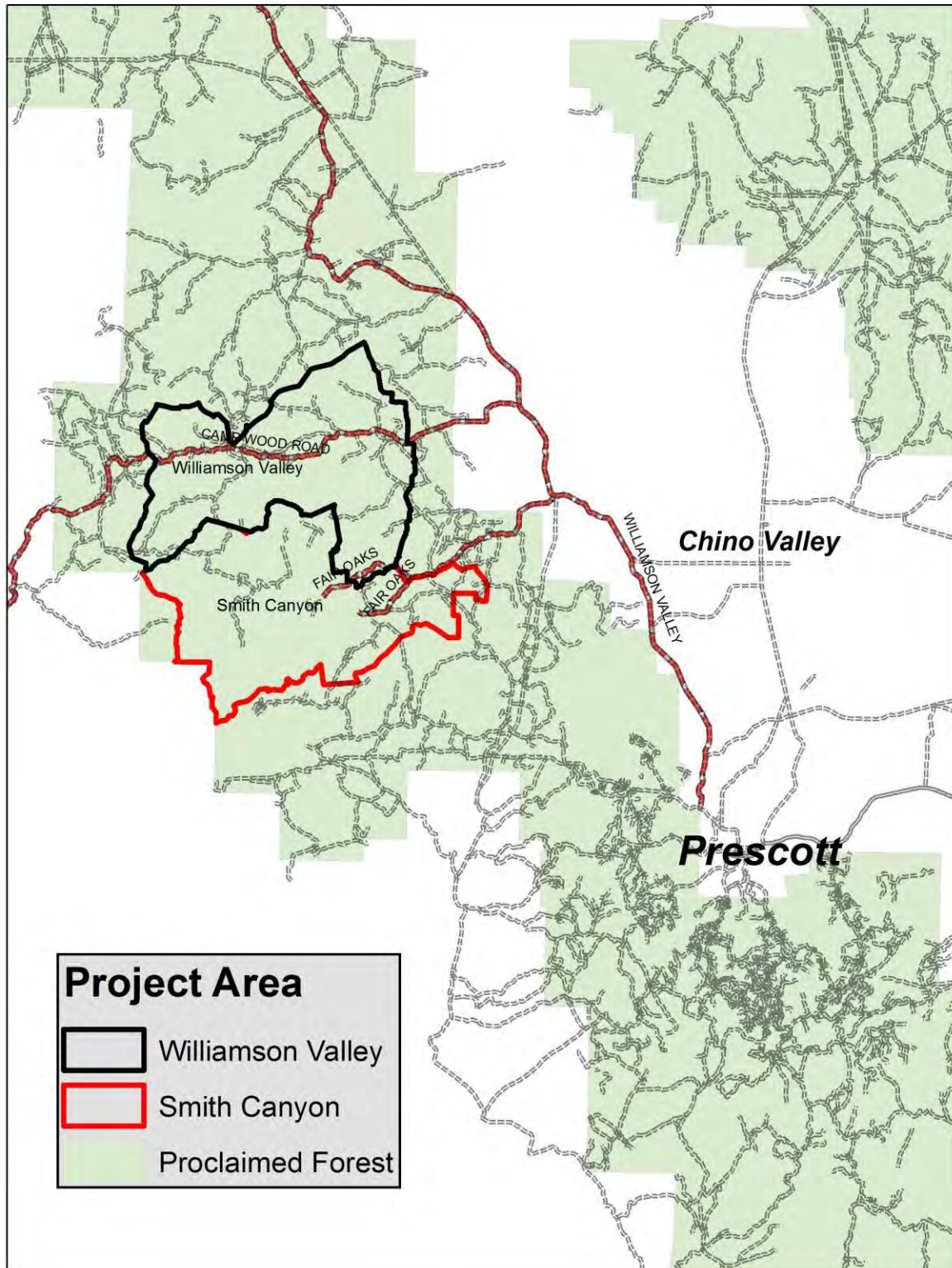
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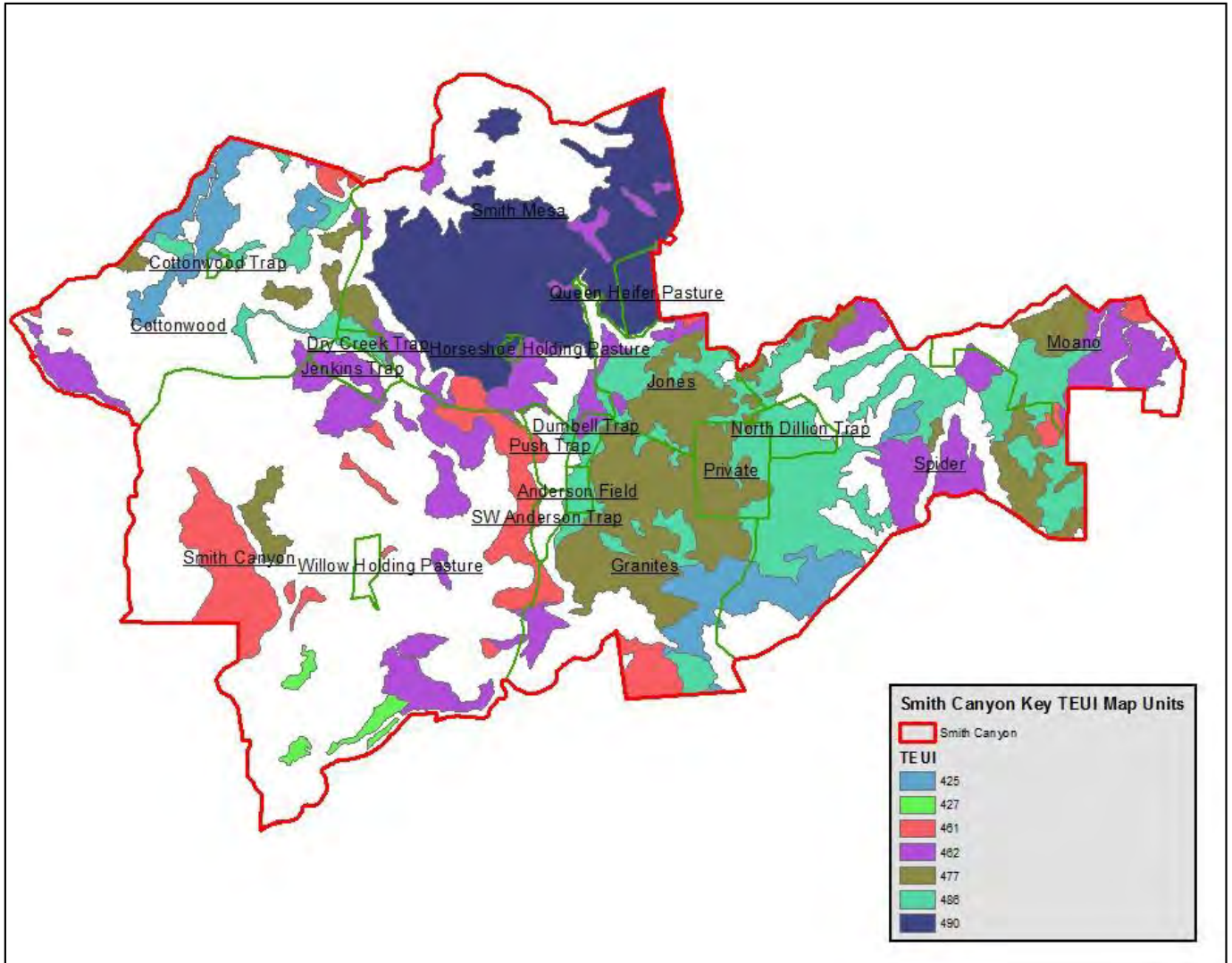
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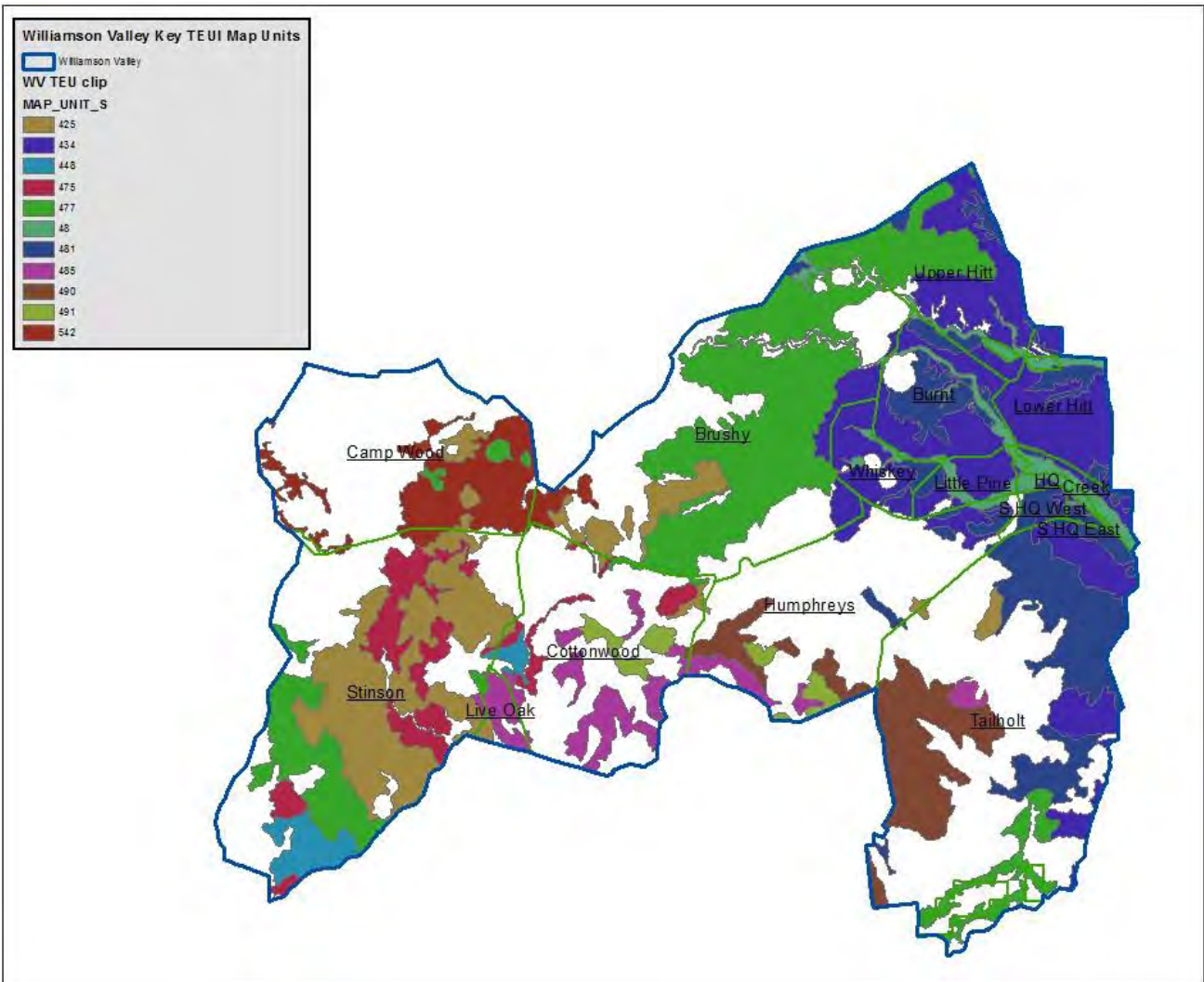
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Appendix 1 – Project Area Map

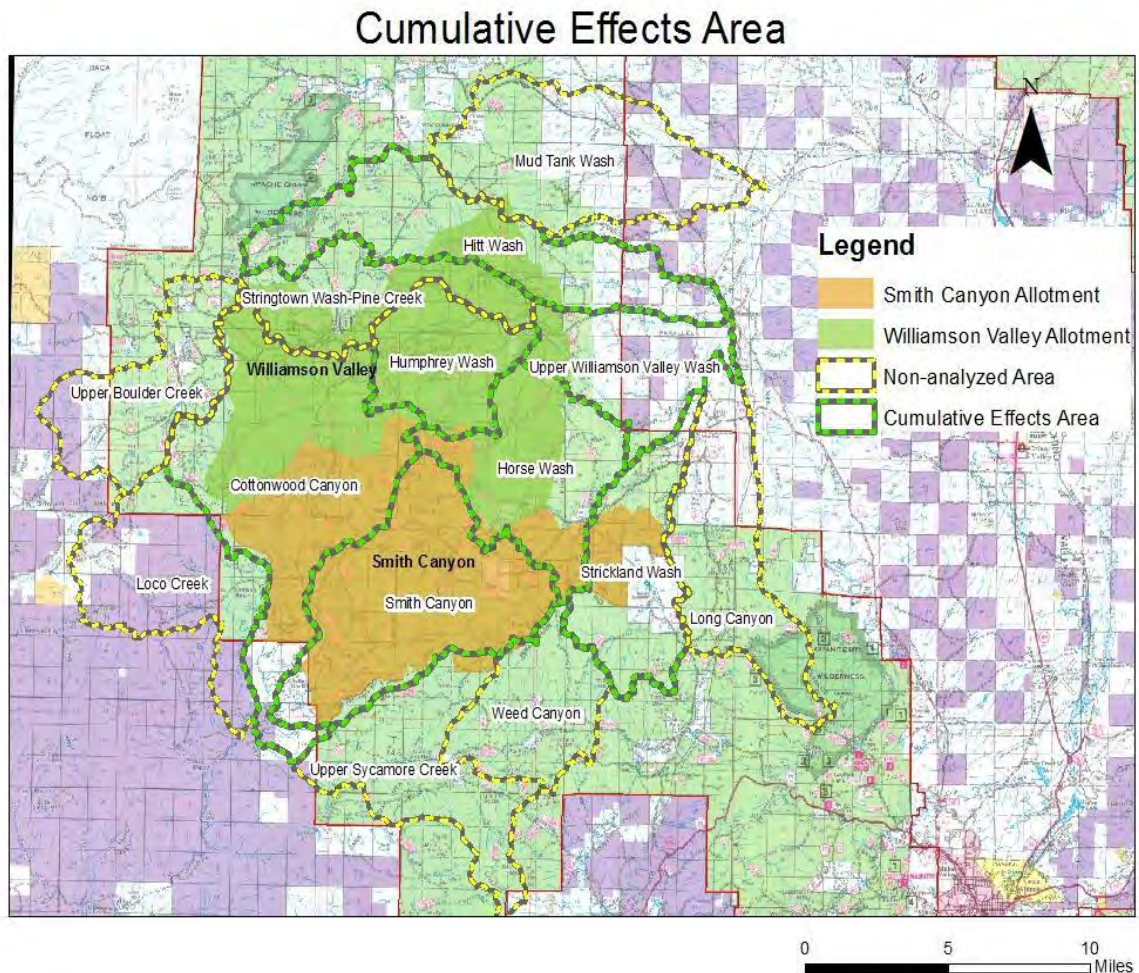


Appendix 2 – Key Vegetation and Soil Map Units by Allotment





Appendix 3 - Cumulative Effects Area for the 6th Code Watersheds Containing the Project Area



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 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.

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

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 – 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.

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.

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.

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

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.

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
 Comment Analysis and Response to Comments

Letter #	Comment # Commenter	Comment	Response
1	1 J. Burgess	<p>Your proposed action, Alternative 1, is very ambitious - and very expensive. It calls for the construction of 18 new livestock waters, rebuilding 5 existing livestock waters, and the construction of several miles of new fence. I don't know how much this will all cost the taxpayers, because you didn't mention the cost in your environmental assessment (EA), but I'm sure it will total in the hundreds of thousands of dollars - all to maintain no more than 575 cattle on public lands. There's also no mention in the EA of where this money will come from, though I suspect it's coming from USDA EQIP grants received by the permittees.</p>	<p>As stated on page 40 of the EA “The cost of constructing new range developments is typically shared between the agency and the grazing permit holder according to Forest Service policy as defined in the Forest Service Manual 2200, Chapter 2240. By proposing the projects in this analysis, there is no guarantee that funds will be available to implement the project. However, if the projects are not implemented, it will likely affect the carrying capacity of the allotment. Range developments that have benefits for wildlife habitat such as water developments may receive funding from external partners vested in activities to promote wildlife habitat improvement.”</p>
1	2 J. Burgess	<p>As for your livestock management proposals for these allotments, it looks like they are little more than NEPA rubber stamp approvals of some plans provided by the permittees so they can get their hands on the EQIP grant money.</p> <p>I say that because the proposed actions are almost solely focused on trying to get these allotments to support the maximum number of permitted cattle. There aren't any riparian specific provisions, for example, other than the oft-repeated but never proven claim that the construction of new upland waters will magically reduce the use of</p>	<p>Project desired conditions provide for sustainability and ecological functionality. The grazing proposal was developed to move towards meeting desired conditions where currently departed. Comment of opinion is noted and considered by the Deciding Official.</p>

			riparian areas by cattle. (Would you climb a steep hill in the heat when you could get easily get a drink from a stream in the shade?)	
1	3	J. Burgess	<p>Page 54 of the EA provides the only substantive information about the current conditions of the riparian areas, and it's not much. It says most of them are in "proper functioning condition" but there's nothing about when these assessments were made. The photo of Cottonwood Creek (Photo 11) appears to have been taken in the cool season, when the cattle wouldn't be likely to be abusing the creek, and there's no mention of when the photo was taken. Can you please provide more details about your riparian monitoring data?</p> <p>At the very least, your proposals should prohibit those pastures containing riparian areas from being grazed during the growing season, but there's no mention of that in the EA.</p>	<p>Page 56 of the EA states, "Where riparian vegetation and conditions exist around developed springs it will be evaluated to determine if desired conditions for groundwater dependent ecosystems are being met, given the existing livestock uses. Where desired conditions are not being met, and can be attributed to livestock management, future practice may be to protect the vegetated area by fencing, and provide livestock water by pipeline and trough outside the fenced area. PFC surveys found perennial and intermittent riparian reaches as Proper Functioning or trending towards this designation. Monitoring and adaptive management would be employed so that management objectives can be achieved in those areas needing improvement." Adaptive management takes into consideration best management practices for upland and riparian areas as to season of use, numbers and duration of grazing animals.</p>
1	4	J. Burgess	In conclusion, it appears to me that your plan isn't much about the protection of public resources, but about maximizing livestock production at any cost.	Comment of opinion is noted and considered by the Deciding Official.
2	1	J. Lininger, Center for Biological Diversity	<p>Suitable habitat for threatened western yellow-billed cuckoo exists in the allotments.</p> <p>Riparian gallery forest consisting of woody species including cottonwood, sycamore, velvet ash and willows complemented by grasses and herbaceous vegetation exists</p>	There are no known Yellow-Billed Cuckoo (YBC) locations or proposed critical habitat within the 5 th code watersheds where the allotments are located. The closest known proposed critical habitat is 17.7 miles southwest of the project area, and the nearest

			<p>at multiple locations in both allotments. Those habitats are suitable for dispersal and foraging of the western yellow-billed cuckoo, a threatened species. See 79 Fed. Reg. 48548, 48551 (Aug. 15, 2014) (“During movements between nesting attempts western yellow-billed cuckoos are found at riparian sites with small groves or strips of trees, sometimes less than 10 ac (4 ha) in extent ... These stopover and foraging sites can be similar to breeding sites, but are smaller in size, are narrower in width, and lack understory vegetation when compared to nesting sites. Therefore ... we identify rivers and streams of lower gradient and more open valleys with a broad floodplain to be an essential physical or biological feature for this species”).</p> <p>Both allotments occur in watersheds where the cuckoo is known to nest and migrate (see February 19, 2016 scoping comment for citations of relevant documentation). The proposed action may affect the cuckoo. The environmental analysis should give a hard look to effects of the proposed action to the cuckoo. However, the EA does not mention the existence of this habitat or potential effects of livestock grazing to the cuckoo. See EA at 58-59 (wildlife). Reasonable design features proposed in scoping comment to minimize indirect and cumulative adverse effects to the cuckoo are ignored by the EA. Consultation is required.</p>	<p>known YBC occurrence is 29.5 air miles northeast on the Verde River. By meeting desired conditions identified in the forest plan for riparian ecosystems, the proposed action will inherently provide the habitat features that would be needed for YBC if they were to migrate through the project area.</p> <p>The wildlife, fish and rare plant reports for the Smith Canyon and Williamson Valley Allotments also serves as the Biological assessment and evaluation to determine if there will be any effects from the project actions to federally listed species or their habitat. Direct, indirect and cumulative effects to listed species, and habitat and for other species of concern will be disclosed in the environmental assessment.</p>
2	2	J. Lininger, Center for Biological Diversity	<p>Suitable habitat for sensitive lowland leopard frog exists in the allotments</p> <p>Lentic and lotic riparian habitats in both allotments are suitable as habitat for lowland leopard frog, a sensitive species whose viability is of concern. The EA acknowledges that the leopard frog is present in Cottonwood Creek. See EA at 58. The frog is vulnerable to adverse indirect and cumulative effects resulting from invasion of exotic predators and chytrid fungus facilitated by livestock grazing (see scoping comment for documentation). The EA errantly states that grazing will</p>	<p>This project would not facilitate the invasion of exotic predators. The wildlife, fish and rare plant reports for the Smith Canyon and Williamson Valley Allotments also serves as the Biological assessment and evaluation to determine if there will be any effects from the project actions to federally listed species or their habitat. Direct, indirect and cumulative effects to listed species, and habitat and for other species of concern will be disclosed in the environmental assessment.</p>

			<p>improve leopard frog habitat: Overall, the quality of the riparian habitat is expected to be maintained or improved through this project. Proposed water developments in the uplands will alleviate cattle watering in riparian areas and relying solely on springs for water, thus improving riparian associated vegetation and habitat used by LLF and their prey. There are no projects that have specifically contributed to improving riparian or aquatic habitat in the project area, therefore this project does not contribute to any cumulative effects.</p> <p>Id. 60-61. The analysis is silent regarding adverse indirect and cumulative effects to the leopard frog. Failure to consider potentially significant impacts would render the EA deficient.</p> <p>The Center previously stated concern in scoping comment on the proposed action that the Prescott National Forest did not justify rolling back its prior designation of lowland leopard frog as a management indicator species (“MIS”) in the revised forest plan. The absence of reason for failing to select the leopard frog as a MIS raised a serious question about the MIS selection process in general. The absence of reason for failing to designate the frog as a MIS for riparian habitat in the forest plan was arbitrary and capricious. The EA displays a site-specific impact of that planning error by discounting potentially significant effects of the proposed action to MIS habitat and viability. See id. 63 (“With less than 3% of any given indicator habitat for MIS, any impacts from the project are on such small scale relative to the forest habitat as to be indiscernible for all of the MIS habitat and population trends”).</p>	<p>The proposed action is designed to maintain or improve conditions across the landscape and to move toward the desired conditions in the forest plan through the feedback mechanism provided by monitoring in the adaptive management approach.</p> <p>Commenter is questioning the validity of a forest plan component that is outside the scope of this analysis.</p>
2	3	J. Lininger, Center for Biological Diversity	<p>Riparian areas in the allotments lack adequate management requirements</p> <p>Lentic and lotic riparian habitats exist throughout the allotments. See id. 53-57 (water resources and riparian</p>	<p>Commenter is questioning the validity of a forest plan component that is outside the scope of this</p>

			<p>areas). In scoping comment on the proposed action, the Center stated concern that the revised forest plan does not contain management direction or plan components, nor does it pose monitoring questions sufficient to meet the minimum requirements for riparian areas established by the NFMA. The revised forest plan is inadequate to meet the high standard of “special attention” to riparian ecosystems, and it does not provide for maintenance or protection of diversity and viability of species associated with riparian habitats. Notably, the revised Forest Plan does not carry forward any of the standards or guidelines of the 1987 plan specific to riparian areas, and the planning record supplied no rationale for the drastic change of management approach. Livestock grazing is a causal factor in the deterioration of riparian areas on the Prescott National Forest (Beschta and others 2012) and the revised forest contains no standards or guidelines that constrain grazing in riparian areas. The proposed action will allow continued livestock grazing in ecologically critical riparian areas. See EA at 55-57.</p>	<p>analysis.</p> <p>The Hydrology Report for the Smith Canyon and Williamson Canyon Allotments displays the current condition of riparian areas and will disclose the direct, indirect, and cumulative effects of the action and no action alternatives of these resources</p> <p>Page 56 Meeting Desired Forest Plan Conditions: Alternative One would meet the requirements of desired conditions for watersheds, in part because it is determined that grazing, at the current numbers, does not exert morphologic change, which is a function of infrequent storms, and probably in many reaches associated debris flows.</p> <p>We can find no place where Beschta and others 2012 state that “Livestock grazing is a causal factor in the deterioration of riparian areas on the Prescott National Forest.” The only reference to Prescott is where one of the authors works. Studies noted were in Southwestern Arizona and the San Pedro river was identified in one figure.</p>
2	4	J. Lininger, Center for Biological Diversity	<p>Grazing capability in the allotments requires site-specific validation.</p> <p>In scoping comment on the proposed action, the Center stated with supporting reasons why it is necessary for the EA to validate the range capability assumptions advanced by the revised forest plan in the action area. We stated that the EA “should specifically account for foreseeable effects of chronic drought on water and forage availability,” and it “cannot punt to amorphous ‘adaptive management’ procedures, such as reducing livestock turn-out or AUM in the allotments contingent on monitoring, where such procedures are not plainly documented or reasonably assured of implementation.” Nevertheless, the Forest</p>	<p>The proposed stocking level is within the range of past stocking levels that have led to achievement of satisfactory vegetation conditions. Under adaptive management, stocking levels are increased or decreased in response to site-specific resource conditions in a given year.</p> <p>The Forest Service approves the number of cattle that will graze each year based upon a review of site specific allotment conditions including forage and water availability, and soil and watershed health. Climate is the single largest influence on forage production, and changes to forage production will</p>

			<p>Service ignored the comment, and the EA contains no information about grazing capability other than to state that certain portions of the action area are not considered capable of supporting livestock grazing. See EA at 44 (Humphreys Pasture).</p> <p>Again, the environmental analysis should candidly disclose potentially significant direct, indirect and cumulative effects of the proposed maximum livestock grazing to be authorized under foreseeable conditions if adaptive management fails (see scoping comment for reasons why failure of adaptive management is reasonably foreseeable). Failure to consider all reasonably foreseeable and potentially significant effects of the action on the environment would render the EA deficient.</p>	<p>be accompanied by changes in stocking levels authorized. This has been taking place already on the allotment, as shown on page 5 of the draft EA that mentions a range of stocking from 200-275 head on Smith Canyon and 225-300 head on Williamson Valley. Actual use on Smith Canyon since 2000 averaged 214 head while average use on Williamson Valley since 2000 was averaged 208 head.</p>
3	1	E. Ryberg, Western Watersheds	<p>This allotment is in an extremely rugged, remote, and arid environment. Many decades of livestock grazing have resulted in altered hydrological regimes, riparian environments, and soil structure, as well as altered wildlife populations. Water has been moved from where it naturally occurs to places it does not naturally occur. Several areas occur with surface flowing water and there are several natural springs. Although no federally threatened or endangered species occupy the allotment, it appears that many “sensitive” species do, for which the Forest Service has heightened obligations.</p> <p>According to the proposed action document, this area has been impaired by livestock grazing, though I notice you are cautious never to attribute the unsatisfactory conditions to current livestock impacts, but only state that the unsatisfactory conditions occur.</p>	<p>The Wildlife Report for the Smith Canyon and Williamson Canyon Allotments displays the current condition of riparian areas and will disclose the direct, indirect, and cumulative effects of the action and no action alternatives of these resources. Information on Forest Service obligations for sensitive species is contained in the Wildlife specialist report.</p> <p>The proposed action has been designed to move toward desired conditions, where possible, and not degrading them.</p>
3	2	E. Ryberg, Western Watersheds	<p>You state that you will improve conditions on areas, including those which you say have zero capacity, by only grazing them up to 30 percent utilization. Is it lawful to grazing no-capacity rangeland to 30 percent utilization?</p>	<p>Project design is to implement incidental use (0-30%) in these areas (Spider pasture TEUI 486, and the east portion of Humphreys pasture TEUI 462, 481, and 490. In addition no practices to draw</p>

			<p>How will you measure it? You also fail to explain how this alleged reduction (notably, it is only a 5 percent reduction from the 35-50 percent utilization proposed for other areas) will occur. The soil types and vegetative types which are in unsatisfactory condition occur all over the allotments, in wavy lines and odd places. You haven't shown why the cows are suddenly going to avoid them or given any evidence that the new water developments will accomplish this, or how.</p>	<p>livestock (water and supplement placement) would occur. EA page 80 defines: "Incidental use targets the lower range of the light use (0-30%) category in all seasons by applying such practices as herding or by limiting where livestock attractants such as salt or water are placed relative to the area of concern. Adaptive management methods and practices to achieve this well be based on site-specific allotment management scenarios."</p>
3	3	E. Ryberg, Western Watersheds	<p>What exactly are the "water developments" you mention? You sometimes refer to trick tanks, but this is not what every development is. You must describe them. Are you "developing" natural springs? Which ones and where? Do you have an inventory that identifies how many developed and undeveloped springs you have on the Forest? I would like to know. Natural springs are a resource that should be protected, and they are getting hard to find.</p>	<p>EA p8. Smith Canyon: Because of limited road access for large vehicles like well-drilling rigs, the proposed water developments on the Smith Canyon Allotment would likely be trick tanks (catchment apron that directs rainfall into a storage tank and pipeline system with troughs), or earthen stock tanks (dug out areas that collect rainfall directed from shallow ditches). EA p.9. Williamson Valley: Different types of water developments may be employed depending on the location, and could include trick tanks with a pipeline to water troughs, earthen stock tanks, or wells. There are a list of Range improvements, which includes springs and developed springs, included in the Term Grazing Permit. Per EA p9. "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</p>

				warrant.”
3	4	E. Ryberg, Western Watersheds	You state on page 3 that “There have not been AMPs in place that were in compliance with the NEPA.” Do you mean there were no AMPs in place, or there were AMPs in place but they did not comply with NEPA?	Smith Canyon has an AMP dated Sept 1982 with no NEPA documentation found. Williamson Valley has no AMP.
3	5	E. Ryberg, Western Watersheds	You propose one alternative that everyone knows you won't pick -- stop grazing entirely -- and another that is a complex morass of multiple and expensive water developments, an increase (apparently -- you don't seem to say) in livestock numbers, and an incomprehensible and in fact unexplained new grazing plan that apparently incorporates rest and deferment, which of course could have and probably has been applied already. Is it really the case that there are no other ways to meet the purpose and need than to increase grazing on these unsatisfactory, zero-capacity areas and spending bags of taxpayer money on moving water around? Wouldn't there maybe be another way? How about an alternative that focuses on landscape health instead of rancher health?	The proposed alternative is expected to either move allotment conditions toward desired conditions or to not degrade current conditions. It is designed to focus on landscape health.
3	6	E. Ryberg, Western Watersheds	You say that you will insure rangeland health through monitoring -- a lot of it -- but you never explain where the resources will come for this or whether you are meeting your current monitoring promises on the Forest. You also don't explain how the monitoring will be done or who will be doing it. These are important matters. Permittees have no incentive to report overutilization. You discuss things like stubble-height at length on page 6 but when it comes to the actual monitoring requirements, you don't mention it at all. Was this an oversight?	EA p 10 Monitoring In order to evaluate whether grazing management is making progress towards meeting desired resource conditions, two types of monitoring would be conducted: 1. Implementation monitoring would be conducted by the Forest Service, and may include, but is not limited to the following: livestock actual use data, compliance with pasture rotation schedules, grazing intensity evaluations during the growing season (within key and critical areas), utilization at the end

				<p>of the growing season (within key areas), and visual observation of vegetation and ground cover.</p> <p>2. Effectiveness monitoring to evaluate the success of management in achieving the desired objectives would occur within key areas at an interval of ten (10) years or less. Effectiveness monitoring may also be conducted if data and observations from implementation monitoring (annual monitoring) indicate a need. This type of monitoring can include species composition, plant cover, frequency or density and/or vegetative ground cover monitored at key areas and at areas identified with site-specific resource concerns. Both qualitative and quantitative monitoring methods can be used.</p>
3	7	E. Ryberg, Western Watersheds	You seem to believe that there is a substantive difference between light utilization, which you say is "30% or less," and incidental use, which you say is "0-30%." Please explain to me how these are different.	<p>Project design is to implement incidental use (0-30%) in these areas (Spider pasture TEUI 486, and the east portion of Humphreys pasture TEUI 462, 481, and 490. In addition no practices to draw livestock (water and supplement placement) would occur.</p> <p>EA page 80 defines: "Incidental use targets the lower range of the light use (0-30%) category in all seasons by applying such practices as herding or by limiting where livestock attractants such as salt or water are placed relative to the area of concern. Adaptive management methods and practices to achieve this well be based on site-specific allotment management scenarios."</p>
3	8	E. Ryberg, Western Watersheds	You repeatedly say you are going to construct "water sources." What exactly is the source of the water in these water sources?	<p>EA p8-9 " Because of limited road access for large vehicles like well-drilling rigs, the proposed water developments on the Smith Canyon Allotment would likely be trick tanks (catchment apron that directs rainfall into a storage tank and pipeline system with troughs), or earthen stock tanks (dug out areas that collect rainfall directed from shallow</p>

				ditches). Williamson Valley: “Different types of water developments may be employed depending on the location, and could include trick tanks with a pipeline to water troughs, earthen stock tanks, or wells.”
3	9	E. Ryberg, Western Watersheds	You quote your Forest Plan, which says "Herbivory aids in sustaining or improving native vegetation cover." Page 18. You are quoting this as if it is an established fact. The Forest Plan uses this sentence, however, as an objective to be aimed for. These are very different things. If I tell you that "I save half of every paycheck for my child's college fund" but then you learn that I am reading from a list of my 1989 New Year's Resolutions, you will have a different understanding of the statement than you might otherwise have.	Comment of opinion is noted and will be considered by the Deciding Official.
3	10	E. Ryberg, Western Watersheds	You also say that as long as there is sufficient canopy cover, then it does not matter if the ET perennial grasses were not present. So is the ET business a measure of canopy cover or of grass diversity? Are you using this model in an acceptable fashion? Isn't that like saying it's okay if I am not saving money for my child's college fund, as I promised my wife I would do, so long as I have quit smoking, which is just as hard?	The Similarity index does use two variables, Cover and Diversity, together. Sufficient cover can allow for reduced diversity if it provides for the same ecological benefits. Inventories for this analysis are one point within a larger TEUI and the ET descriptions are derived from multiple samplings across the forest. Species on a particular location will vary depending on slope aspect and soil inclusions, therefore having the exact number of species the ET describes is highly unlikely.
3	11	E. Ryberg, Western Watersheds	Another example is page 27, where you explain that even though a site has low similarity to its ET, "the amounts of perennial grass cover and high number of species performs the same ecological function as the species listed in the ET description." But weren't those species picked for reason? Are you so sure the ecological function is the same? Why don't you explain why this departure is acceptable and not a Forest Plan violation.	See response to 3-10.

3	12	E. Ryberg, Western Watersheds	You also state that as long as an areas is 35 percent similar to what it could be, then it is meeting your desired future conditions. Isn't this a pretty low standard? How did you come up with this figure? Whenever I used to get a 35 on my Statistics exams in college, it was always considered a pretty bad score. Why is it a good score here?	See response to 3-10. Standards are outlined in Rangeland Analysis and Management Training guide (Revised 7/99). Inventories for this analysis are one point within a larger TEUI and the ET descriptions are derived from multiple samplings across the forest. Species on a particular location will vary depending on slope aspect and soil inclusions, therefore having the exact number of species the ET describes is highly unlikely.
3	13	E. Ryberg, Western Watersheds	You repeatedly state that species diversity problems would be solved by managing "adaptively" but you never explain how this is going to work. Why not do the "adapting" right now and explain what exactly it is? See page 21 and passim.	A description of the adaptive management process is provided on pages 5-6 of the draft environmental assessment
3	14	E. Ryberg, Western Watersheds	You have three condition categories, "Satisfactory," "Unsatisfactory," and "Impaired." Do you see why this is not a rational system? The terms "satisfactory" and "unsatisfactory" cover the field and don't leave room for a third term. It's like having a billing system in your company that identifies services as "Paid," "Unpaid" and "Awaiting Payment." Something is paid or it isn't, and is satisfactory or it isn't. Are you saying there is a kind of place that is neither satisfactory nor unsatisfactory? Are these the appropriate terms from the Forest Plan?	Standards are outlined in Rangeland Analysis and Management Training guide (Revised 7/99). The EA at p80-81 defines: 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. 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. 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.
3	15	E. Ryberg, Western Watersheds	Your analysis does not reference or meet appropriate Forest Plan standards for water, soil, wildlife, range, or monitoring.	Relevant standards and guidelines for a variety of resource areas including water, soil, wildlife, range and monitoring are referenced from the Forest Plan and are identified in pages 29-30 for the Smith Canyon and 41-42 for the Williamson range specialist report. Standards and guidelines provide sideboards and guidance for project and activity decision making to help achieve desired conditions and objectives.
3	16	E. Ryberg, Western Watersheds	The Forest Service does not have a good recent history of completing the monitoring it promises, and there are no current prospects for increased budgets. Certainly the return on this allotment from grazing fees won't pay for that monitoring. You must include an "escape valve" option that occurs if monitoring ends up not happening.	Monitoring will follow Prescott National Forest protocol
3	17	E. Ryberg, Western Watersheds	You also must acknowledge who exactly is doing the monitoring. Often we learn it is the permittee, who obviously has an incentive not to self-report problems that may cost him his permit.	Monitoring accomplished by the permittee is reviewed and validated by Forest Service personnel and will follow Forest Service protocols.
3	18	E. Ryberg, Western Watersheds	You also must show how this adaptive management scheme, which has been in place for some years now, has worked thus far on the Prescott National Forest. Because, if it hasn't worked, then it is arbitrary and capricious for you to rely on it now.	There is a great deal of science showing that adaptive management is successful as range conditions on allotments where it is practiced have shown improvement.

3	19	E. Ryberg, Western Watersheds	What about invasive plants? Have they been surveyed on this allotment? Do you intend to address that issue?	Management of invasive species is considered in the EIS for Integrated Treatment of Noxious or Invasive Weeds and is outside the scope of this analysis.
3	20	E. Ryberg, Western Watersheds	Finally, please make note of the recent science that has shown extremely elevated levels of e. coli in areas grazed by livestock, including wilderness areas.	The referenced research was not provided by the commenter. The effects of livestock grazing on pathogens is discussed in the range resource specialist report.
3	21	E. Ryberg, Western Watersheds	The presence of the roadless area, the conditions of the landscape, the limited alternatives you are evaluating, the tremendous loss to the taxpayer, and the water resources here all point toward the need for an environmental impact statement.	One purpose an Environmental Assessment is to provide sufficient information for the responsible official to determine the need for an Environmental Impact Statement.
3	22	E. Ryberg, Western Watersheds	Please be sure to keep us on the mailing list and send us a complete copy of the Biological Evaluation for wildlife and plant species when it is completed, as well as a complete copy of the environmental assessment, the range specialist's report, the riparian report, and the vegetation specialist's report.	Commenter will remain on mailing list and requested documents have been or will be uploaded onto project webpage.
4	1	J. Eby	The Forest Plan has one statement relating to rangeland management: "Herbivory aids in sustaining or improving native vegetation cover and composition". I find nothing else in the plan relating to rangeland management. There are guidelines for the use of fire to maintain grasslands and woodland communities but nothing in your EA stating where or when you plan to use these tools.	Concern noted. The forest plan sets desired conditions at a landscape scale. The contents of the forest plan are outside the scope of this analysis.
4	2	J. Eby	I have watched the Smith Canyon allotment since 1979. I have seen and measured a fine increase in vegetation cover and composition. This is documented in the studies that you have in your files as well. The most significant changes have been in the stream courses and chaparrals. These improvements have been achieved under higher	Authority for grazing permit modifications that result in either an increase or decrease in number or period of use is described in Forest Service Handbook 2209.13. Changes in grazing permits may be made to 1) achieve proper forage resource by livestock, 2) comply with Forest Plans, laws,

			<p>stocking rates than those that are being proposed. Pasture rest and deferment are not means of applying Herbivore to achieve desired resource conditions. Adaptive Management. There should be a proposal to change the stocking rate up if indeed resource conditions continue to improve or a need to use livestock impacts to make desired changes is indicated.</p>	<p>regulations and policy or 3) suspend or cancel grazing permits as needed to insure permittee compliance with provisions and requirements of permit.</p>
4	3	J. Eby	<p>I cannot believe that the Southwestern Region of the Forest Service is willing to rely on the work attributed to Dr. Hollicheck. I have reviewed Dr.Hollicheck's studies in writing and in the field and find major fault in his work. The Doctor designed his studies to provide the result he desired and then did not honestly report the result of his monitoring. Neither percent of utilization nor stubble height provide a meaningful measure to guide management changes needed to improve vegetation density and diversity or soil improvement.</p>	<p>An analysis of the effects of livestock grazing on the vegetation resource has been included in the environmental assessment. The utilization research of Holechek and Galt (2000, 2004) was considered during the analysis. Vegetation specialist reports outline that utilization levels of 35-45% would support maintenance of vegetation health. Through adaptive management, utilization levels could be prescribed at lower levels in response to drought conditions or resource concerns</p>
4	4	J. Eby	<p>Table 2 Veg Treatment Projects: I can show each resource specialist the continuing effects of the past vegetation treatments if they care to look. During our meeting at Chino I offered that assistance and was never contacted. I am glad that projects are planned within the next 10 years.</p>	<p>Offer of assistance is noted</p>
4	5	J. Eby	<p>Livestock Grazing: I do not believe that you display a stocking level that is in balance with annual forage supplies. This analysis states that stocking rates will not exceed 250 even if the forage supply indicates a higher stocking. The only mitigation is a reduction.</p>	<p>Authority for grazing permit modifications that result in either an increase or decrease in number or period of use is described in Forest Service Handbook 2209.13. Changes in grazing permits may be made to 1) achieve proper forage resource by livestock, 2) comply with Forest Plans, laws, regulations and policy or 3) suspend or cancel grazing permits as needed to insure permittee compliance with provisions and requirements of permit.</p>

4	6	J. Eby	<p>Smith Canyon Pasture: TEUI 427 & 461. The introduction to this section says that you chose sites that were typical of the pasture. These two sites are least typical of this pasture. The soils belong to the same soil type, Argistolls, but one is vertic and the other typic. These are very productive soils as the sample area chosen in 461 shows. However once they become vertic their ability is markedly reduced. The position on the landscape of the vertic soil has predisposed it to damage from the road, proximity to water, and added access due to the road. I am very familiar with these soils. We used to call them Springerville or Rimrock. I have never seen these sites change for the better.</p> <p>The TEUI 461 has two Units. One is a very shallow soil and less productive than the Unit 0.1.</p>	<p>See the methodology and rationale for key area selection for rangeland and soil analysis as discussed in the Soils and Vegetation/Rangeland specialists' reports.</p> <p>There are multiple components within a TEUI suggesting high variability due to variety of factors such as landscape position, aspect, parent material, slope, gradient, microclimates, etc. Development of vertic soils due to loss or partial loss of the A horizon has been analyzed and discussed as part of the soil condition process.</p>
4	7	J. Eby	<p>Granites Pasture: TEUI 461 Again you selected a site that represents only 9% of the pasture, next to the fence, and Walker Tank. This is again a Typic Argistoll.</p>	<p>See above response for referring to specialists' reports in selecting key areas. Sites are selected for representation of grazing effects which may differ for other management activities.</p>
4	8	J. Eby	<p>Spider Pasture: TEUI 486 This soil is misidentified in the TE Survey. My mistake while working for the Forest was that I relied on the TES identification and spent time and money in the wrong project design. The Soil Survey of Yavapai County, Arizona, Western Part, 1976, properly identifies this soil as a Barkerville series, a Lithic Ustollic Hapiagid. The sub soil is at 5-10 inches below the surface and is massive and hard when dry.</p> <p>This same soil exists at Parker Springs on the K4. I even brought Serage Ahuga our Soil Scientist out to Dillon Field to ask why we did not gain the response we desired and he made the same misidentification. You need to reassess this key area.</p>	<p>There are many components within a TEUI with a great deal of variability which are considered when determining soil condition. Reclassifying soils in the TES is outside the scope of this analysis.</p>

4	9	J. Eby	<p>Smith Mesa Pasture: TEIU 490 These soils are again vertic Paleustolls and vertic Haplustalfs and montmorillonitic. There is no reason to believe that these sites will change.</p> <p>The use of a key area and key species monitoring is a flawed concept when coupled with a low to moderate utilization standard. When you move the cattle to a new pasture they will utilize the best and most accessible forage first. Cattle are not dumb. No amount of fencing or herding will change this fact.</p> <p>The TES crew was on the Prescott during the most severe drought during the last decade. Their "FORG" values are extremely low. Applying an assumed 45% across all acres assumes that the cattle use all sites in the pasture equally. If your monitoring is on key areas you will reach 45% before the cattle get out of site and that on key species.</p> <p>I do not follow the rationale used for the soils interpretations at all but I will leave it there. I will again offer my time to you to review these concerns in the field.</p>	<p>Capability and productivity and differing successional state capabilities is identified in the TES ecological classification and was field verified to an enclosure within the allotment.</p> <p>The monitoring protocols are determined at the regional level and are outside the scope of this analysis.</p> <p>The FORG values in TEUI provide an average production based on 30 years of climate. The values account for a wide range of variability. Variability is accounted for in adaptive management. This was considered in the development of the proposed action and the analysis.</p>
5	1	D. Routson	<p>Considering the continued drought conditions that have prevailed in the Southwest for the last many years and how low things were in 2002, the range area in this study is in great condition. The forage in the predominate juniper woodlands is predictably not great even in good moisture years due to the junipers' nature of sucking up the available water.</p>	<p>Comment of opinion is noted and considered by the Deciding Official</p>
5	2	D. Routson	<p>From a conservation standpoint thinning the junipers to allow for forbs and grasses cuts down on the erosion that can be a problem. Controlled burning and allowing natural wild fires to burn is also good practice. This study area has few</p>	<p>Statement of the support for the project is acknowledged and considered by the Deciding Official. The effects of the proposed action are analyzed in the environmental assessment.</p>

			structures and roads and thus is a good area for allowing natural fires to burn. Continued harvesting of fuel wood where practical is also good from an economic and conservation viewpoint.	
5	3	Donald Routson	This study area is a part of the Colorado River watershed but is not dependent on Colorado river water and this is a good thing. The range in this study is free of genetically modified organisms and agricultural chemicals. The cattle produced on these allotments are as clean a food as is available in this country, not unlike wild creatures. As such they are a valuable part of our nation's food security. The ranchers are literally our "boots on the ground" who on a daily basis, are monitoring and caring for our public lands. The public/private partnership that the allotment system entails is good for the country. Keep up the good work!	Statement of the support for the project is acknowledged and considered by the Deciding Official
5	4	D. Routson	Removing cattle from these allotments will not significantly improve range conditions and in fact will contribute to a reduction of the ongoing conservation enhancements the ranchers perform.	Comment of opinion is noted and considered by the Deciding Official. The effects of the proposed action are analyzed in the environmental assessment.
6	1	G. Steiger Ranch Manager Smith Canyon Allotment	Our primary concerns are that we do not believe that the key areas currently selected are truly representative of any of the larger pastures and that there are errors in identifying soil types. The importance of accurately identifying soil types and selecting key areas that are truly representative of the whole pasture cannot be overstated.	Key area sampling sites were identified within each representative TEUI and were chosen based on their representation of environmental conditions of the selected map unit. See the methodology and rationale for key area selection for rangeland and soil analysis as discussed in the Soils and Vegetation/Rangeland specialists' reports. There are multiple components within a TEUI

				suggesting high variability due to variety of factors such as landscape position, aspect, parent material, slope, gradient, microclimates, etc.
6	2	G. Steiger Ranch Manager Smith Canyon Allotment	Smith Canyon Pasture - The key soil map units selected for monitoring in this pasture, TEIU 427 and TEIU 461 are not typical of the pasture. Those soil types represent a very small percentage of a very large pasture and the clusters C23 and C24 are both located close to trails that, due to geographic constraints, get very heavy traffic.	See above response to comment 6.1 for referring to specialists' reports in selecting key areas. Sites are selected for representation of grazing effects which may differ for other management activities. Key areas selection considers, among other things, previous long-term monitoring sites to determine historical trend. To show variability of conditions TEUI 461 was also selected to represent the effects of grazing.
6	3	G. Steiger Ranch Manager Smith Canyon Allotment	Smith Canyon Pasture - Adding clusters on TEUI 427 and TEUI 432 soils on the North and South Benches, on TEUI 461 soils on Cedar and Smith Mesas and on TEUI 430 soils north or east of Willow Springs would provide monitoring data that is far more representative of the pasture as a whole.	See above response to comment 6.1 for referring to specialists' reports in selecting key areas. Sites are selected for representation of grazing effects which may differ for other management activities. Key areas selection considers, among other things, previous long-term monitoring sites to determine historical trend. To show variability of conditions TEUI 461 was also selected to represent the effects of grazing.
6	4	G. Steiger Ranch Manager Smith Canyon Allotment	Smith Canyon Pasture - Keeping incidental use levels at C23 below 30% will be extremely difficult and may result in underutilizing the biggest pasture on the allotment while increasing impacts on the smaller pastures (containing riparian areas) that we will then have to rely on.	An analysis of the effects of livestock grazing on the vegetation resource has been included in the environmental assessment. The utilization research of Holechek and Galt (2000, 2004) was considered during the analysis. Authority for grazing permit modifications that result in either an increase or decrease in number or period of use is described in Forest Service Handbook 2209.13. Changes in grazing permits may be made to 1) achieve proper forage resource by livestock, 2) comply with Forest Plans, laws, regulations and policy or 3) suspend or cancel grazing permits as needed to insure permittee compliance with provisions and requirements of

				permit.
6	5	G. Steiger Ranch Manager Smith Canyon Allotment	Granites Pasture - Again, TEUI 461 represents a very small percentage of this pasture. We have seen very little change in conditions near CS in the last 30 years. Use of this area can be easily limited by closing Walker Tank, but potential for improvement is very slight. A more accurate representation of this pasture could be obtained by establishing clusters in TEUI 477 soils on sites located a reasonable distance beyond major trails.	Both of these TEUIs were considered which display the variability of conditions within the pasture. Specifics of key area selection can be found in specialists' reports. Adaptive management has been identified as a response to the lack of water which impacts 461.
6	6	G. Steiger Ranch Manager Smith Canyon Allotment	Spider Pasture - Retired FS Range Conservationist Jay Eby, who has observed trends on this allotment for over 40 years, has told me that TEUI 486 is misidentified. C4 is also located in a very high traffic area. TEUI 483 and 462 soils are the most productive sites in this pasture. We should include monitoring data from sites established on these soils.	There are many components within a TEUI with a great deal of variability which are considered when determining soil condition. Reclassifying soils in the TES is outside the scope of this analysis.
6	7	G. Steiger Ranch Manager Smith Canyon Allotment	Smith Mesa Pasture – C10 is also located in a high traffic area. Establishing new clusters reasonably far from FS road 705 on the south end of the TEUI 490 soils would help provide a more accurate picture of overall trend here, as would a cluster in the 491 soils.	Refer to specialists' reports in selecting key areas. Sites are selected for representation of grazing effects which may differ for other management activities. Key areas selection considers, among other things, previous long-term monitoring sites to determine historical trend. To show variability of conditions, multiple TEUI s were selected to represent the effects of grazing.
6	8	G. Steiger Ranch Manager Smith Canyon Allotment	The labor costs of building a new fence to split this pasture may be prohibitive. If we had to proceed with this project we would suggest re-routing the east portion to tie off at the head of Smith Canyon.	Labor costs were not part of the scope of this analysis. Management tools were considered in order to achieve vegetation objectives

6	9	G. Steiger Ranch Manager Smith Canyon Allotment	Table 4 on P. 25 lists Smith Canyon Rangeland Management Status as Unsatisfactory even though you calculate that TEUI 427 soils only occur on 2% of the pasture. Tables 7 (P. 41) and 9 (P.44) list existing soil condition in the Granites pasture as unsatisfactory and impaired even though TEUI 461 soils occur on only 9% of that pasture.	Representative key area sites were selected based on methodology and rationale discussed in soil and range-vegetation specialists' reports.
6	10	G. Steiger Ranch Manager Smith Canyon Allotment	Table 11 on P. 51 lists the Cottonwood Canyon watershed condition as "At Risk (Fair)". We don't understand what led to this conclusion, particularly when all 3 sites visited in Cottonwood Canyon by Hydrologist E. Moser in Dec.2015 were found to be in "Proper Functioning Condition". Since 1995 we have made improvement of riparian areas in Smith and Cottonwood Canyons one of our highest priorities. This "At Risk" classification seems arbitrary and capricious to us.	Watershed conditions are determined using national watershed condition framework protocols. Condition classification considers multiple attributes and indicators, not only riparian.
6	11	G. Steiger Ranch Manager Smith Canyon Allotment	We congratulate the team for producing one of the most comprehensive studies we've seen on this allotment to date. The Smith Canyon allotment covers a lot of country and a big percentage of it is hard to get to. There is no way a TEUI survey team or a NEPA study team can just drop in and spend a few days and really see all of it or completely understand overall trends. We're still working at it too, and have been since the early 60's. We are as committed as anyone in the FS to ensuring that we operate in a way that is sustainable in the long term and we want conditions everywhere on the ranch to improve.	Statement of the support for the project is acknowledged and considered by the Deciding Official
7	1	J. Cobb Great Old Broads for Wilderness	Broads does not want to eliminate all grazing, but instead, advocates for management that ensures grazing practices are sustainable, allowing lands to remain ecologically diverse with healthy, functioning ecosystems.	Project desired conditions provide for sustainability and ecological functionality. The grazing proposal was developed to move towards meeting desired conditions where currently departed

7	2	J. Cobb Great Old Broads for Wilderness	1. Livestock degrade wilderness landscapes 2. -- grazing threatens native species; 3. reduces water quality; .4_spreads invasive weeds; 5 skews natural fire regimes; and accelerates soil erosion, damaging riparian and upland ecosystems and on public lands. 6 Any forage consumed by domestic livestock is not available for native wlldlife . 7 And if you have ever camped or picnicked or swam among sheep or cattle -- or more likely their droppings -- you know that livestock detract from the Wilderness experience.	Comment is a statement of general opinion. A complete analysis of the environmental effects of the proposed action as well as the no action alternative will be provided in the draft Environmental Assessment
7	3	J. Cobb Great Old Broads for Wilderness	You have failed to provide a full range of alternatives. Per §1500.2 Policy. Federal agencies shall to the fullest extent possible: (e) Use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment. In your EA, you have proposed only two alternatives. NEPA analyses shall "include the alternative of no action"(40 CFR 1502.14). The definition of the no-action alternative for newly proposed actions seems clear (i.e., the agency will not implement the proposed action or alternative actions). Your alternative 2 is not a no action "status quo." Additionally, there is no range of reasonable alternatives; just graze at current levels or don't graze. What about alternatives that would close pastures not meeting desired conditions, reduce #s of permitted cattle, eliminate grazing from areas with significant recreational use, establish landscape scale ungrazed areas for true comparison reference areas? None of these are being considered in your EA	The National Environmental Policy Act requires a range of alternatives only for an Environmental Impact Statement (EIS). It is expected that a project analyzed under an EIS may have significant environmental impacts and therefore it would be important to consider alternative means of achieving the project's purpose. For an Environmental Assessment, there is no requirement for a range of alternatives, and Forest Service policy allows for there to be just one alternative, the proposed action, if there are no issues that would require an additional alternative. Forest Service Handbook direction for range analyses requires the consideration of a no grazing alternative as the no action alternative. There is no requirement to consider current management if it does not respond to an issue.
7	4	J. Cobb Great Old Broads for Wilderness	The Land - Soil and Vegetation. Biological soil crusts are an ecologically important soil cover that exist around the world are critical ecological components of arid ecosystems. They perform a variety of ecosystem functions, such as holding soils in place, increasing soil health and improving water infiltration and retention. Soil crusts are especially vulnerable to destruction from	Project design features to improve soil condition where it is not meeting desired condition have been factored into the grazing proposal. Rest or removal from grazing is an option under adaptive management and is based upon the results of monitoring. A complete analysis of the soil and hydrology resource is provided in the environmental

			<p>disturbances such as livestock grazing. By increasing readily available nutrients in the soil, plants that grow in or near crusts have been found to have increased mineral uptake. The bacteria produce compounds that stimulate plant growth and have also been found to limit the invasive cheatgrass species. Crusts can also influence and increase water retention.</p> <p>Broads is concerned with the health of the soil, which will promote healthy vegetation and increase water retention to further prevent erosion. It is vital that further monitoring of soils and vegetation be done beginning with a baseline before further grazing is allowed on these allotments and continuing periodically with the seasons. Some very few examples of mature crusts can be found hidden in prickly vegetation. These crusts should be much more widespread. How is the forest managing for crust recovery? Timing of grazing for soil crust protection/expansion would require grazing only when the soils are frozen in winter. Existing effects of erosion should be repaired by sustainable means.</p> <p>We would like to see soils examined separately from the vegetation in the EA. As it is presented there is a confusing lack of a clear picture for each site.</p>	<p>assessment and specialist reports.</p> <p>Monitoring approach conforms with Forest Service standards and is outlined on page 10 of the environmental assessment.</p> <p>Soils and vegetation were analyzed separately. Consult the soils and vegetation specialist report for more information.</p>
7	5	J. Cobb Great Old Broads for Wilderness	<p>2. Riparian Habitat and Wildlife. Grazing transforms riparian zones leaving behind mud pools, devastating water quality, hastening erosion, and robbing wildlife of habitat and clean water. Because of past damage, and to prevent further damage to riparian habitat and vegetation, there should be baseline analysis and continued monitoring to meet current or future standards, especially in the light of climate change. Broads is concerned with keeping lands and waters intact that sequester carbon and help species adapt to changing conditions. Livestock consume tremendous amounts of water daily. This water could benefit native plants and wildlife. Please include an</p>	<p>Riparian areas were evaluated as part of the environmental analysis. Most were found to be meeting desired condition. Those needing improvement will be monitored to determine if satisfactory progress is occurring. Riparian areas within a pasture are typically grazed for only a few months out of the year. The effects of the proposed action and no action alternative are provided in the environmental assessment.</p>

			analysis of the water removed from the ecosystem by livestock on these forest lands and a hydrologic report that addresses this dewatering for the benefit of livestock. What is a "water lot"? Water developments must be more specifically identified and the environmental impacts addressed for a specific site unless further NEPA analysis will be conducted for each "improvement" in the future	
7	6	J. Cobb Great Old Broads for Wilderness	Cattle and other wildlife need water. Wildlife did just fine before humans began running livestock on these landscapes and would benefit greatly from the removal of livestock in many areas. Should livestock grazing occur, Broads would like to see positive methods employed to maintain healthy water sources, providing the least destructive methods of tanks, or whatever sources are necessary.	New water developments are being proposed as part of the grazing alternative. Water sources are open to wildlife year long, while cattle only use a particular water source for a small portion of the year. Comment unresponsive of new waters is noted.
7	7	J. Cobb Great Old Broads for Wilderness	The forest is for all us. Maintain access to humans and wildlife to prevent as little damage as possible. Minimize the use of fencing and require active herding on a daily basis. Require wildlife friendly fencing. If gates are an issue for proper livestock management require cattle guards.	Public access is outside of the scope of this grazing authorization proposal
7	8	J. Cobb Great Old Broads for Wilderness	Hurray for management that will take into account the changing needs of the land, her denizens and future especially in the light of climate change. The concept and design is good, however, for this to work requires consistent and active monitoring of many variables. The proper application of Adaptive Management is not guaranteed. Should budgets be cut this type of monitoring often fails to be accomplished. Many statements are made in the EA that "if monitoring indicates X...management WILL be modified." But what happens if monitoring does not occur? There should be "if then" clauses in the grazing management that "if planned monitoring cannot be conducted ...then the allotments will be closed to livestock grazing". You would do this type of management for recreational facilities or nearly all other forest uses.	Supportive comment for adaptive management is noted. Monitoring guidelines will follow current Prescott National Forest protocol

7	9	J. Cobb Great Old Broads for Wilderness	Grasses and other vegetation should be native, diverse, abundant, and in a full range of age classes and sizes. There should be evidence of desirable plant recruitment and seed-head maturation. Before a pasture is depleted of grasses, vegetation, and healthy soils, leaving behind a stark landscape and erosion, it would make sense to us to move the cattle to another location and allow the grazed pasture to restore itself when possible, avoiding expensive and sometimes destructive treatments. Most of the pastures in these two allotments are already seriously degraded, not meeting desired conditions, showing a loss of grass cover and loss of species diversity, soils are impaired, rare riparian is at risk. These conditions cry out for significant changes in management on these allotments. Removal of livestock may be the best and most economical solution. At a minimum the forest cannot continue to use the same management strategies (just in new locations!) that led to the current depleted conditions. Yearlong grazing is not sustainable and should not occur on our public lands.	Desired condition for vegetation is the maintenance of vegetation with mid to high similarity to the Desired Vegetation Status (DVS) providing for ecological functionality and resiliency following disturbance while sustaining long-term productivity of the land. Desired condition for soil is maintenance of soils in satisfactory condition over the long term or shows improvement in areas departing from satisfactory condition where livestock is contributing to the departure. The grazing alternative has been formulated to lead to attainment of desired conditions by implementing project design features and resource protection measures
7	10	J. Cobb Great Old Broads for Wilderness	Utilization is proposed at 35-45%. On already degraded lands in poor condition this is still too high. Holechek suggests 30% as a more appropriate, conservative utilization. A range of utilization is not helpful as it nearly always is applied at the higher rate. For range recovery/improvement the lower utilization rate of 30% would provide opportunity for ecological recovery. Rest for certain pastures must be more than one or two seasons. It can take decades for real ecological recovery to occur on badly degraded lands and soils. Livestock should not be put in areas "not meeting desired conditions for soils."	An analysis of the effects of livestock grazing on the vegetation resource has been included in the environmental assessment. The utilization research of Holechek and Galt (2000, 2004) was considered during the analysis. Vegetation specialist reports outline that utilization levels of 35-45% would support maintenance of vegetation health. Through adaptive management, utilization levels could be prescribed at lower levels in response to drought conditions or resource concerns
7	11	J. Cobb Great Old Broads for	The forest should add Global Warming/Climate Change. It is predicted that the Southwestern region will experience increasing temperatures, longer and deeper droughts, and more extreme precipitation events. Through adaptive	Climatic conditions are considered, and will be part of adaptive management. Page 36 Alternative 1 "Climate and rainfall will have the most significant impact on the cover and

		Wilderness	management strategies, you must respond to climatic variability (e.g., drought) and change by utilizing a variety of tactics, including flexible stocking rates and grazing strategies to conserve natural resources. Reducing permitted numbers from the beginning would be one reasonable approach to accommodating changing climate conditions.	vigor of perennial grasses when grazing is properly managed.”
7	12	J. Cobb Great Old Broads for Wilderness	Broads believes an alternative that highlights truly sustainable grazing should be included. This would emphasize recovery of forest resources as listed above rather than emphasizing accommodating one or two individual rancher's desires to make their livestock operations most profitable .	The proposed alternative is expected to either move allotment conditions toward desired conditions or to not degrade current conditions. It is designed to focus on landscape health.
7	13	J. Cobb Great Old Broads for Wilderness	The EA is written with consistent and obvious bias that leads to many inaccurate and unsubstantiated statements. Often continued grazing WILL improve conditions but removing livestock MAY improve conditions. For each such statement we ask you to prove it. Provide data and evidence that these divergent statements are indeed true.	Comment of opinion is noted and considered by the Deciding Official.
7	14	J. Cobb Great Old Broads for Wilderness	Please provide background on the past and current livestock use of these allotments, the compliance of the current permittees, and the forest's assessment of what lands are both suitable and capable of being grazed by livestock. Also include information on the effectiveness of juniper thinning on the ecological health and biodiversity of all forest resources.	Past livestock use is outlined in Range-Vegetation specialist report Table 2 and 3, along with any inspection and compliance issues in appendix 1.
7	15	J. Cobb Great Old Broads for Wilderness	There seems to be great discrepancy/latitude in establishing the Desired Pasture Ratings. i.e. Lower Hitt has minus 10.5 ecological type grass cover percentage, minus 2 grass species deviation, and the watershed is at risk but this pasture is somehow considered to be meeting desired conditions?! We believe the forest should be managing for more than forage for livestock and that failure to have diverse and consistent vegetation cover is a failure of forest management. Too many pastures are described as having low species diversity but then considered as having	The Similarity index does use two variables, Cover and Diversity, together. Inventories for this analysis are at one point within a larger TEUI and the ET descriptions are derived from multiple samplings across the forest. Species on a particular location will vary depending on slope aspect and soil inclusions, therefore having the exact number of species the ET describes is highly unlikely. Watershed conditions are determined using national

			desired conditions met. This can't be possible.	watershed condition framework protocols. Condition classification considers multiple attributes and indicators, not only vegetation.
7	16	J. Cobb Great Old Broads for Wilderness	It is very confusing in the EA as to what you are referencing (pages 37 & 38) as head, AUM, adult cattle, and cattle are used in various ways. Each of these has a distinct meaning and confuses the information you are trying to share.	Comment is a statement of general opinion and is noted
7	17	J. Cobb Great Old Broads for Wilderness	<p>Broads travelled to the area with another interest group on May 30 and May 31. Please consider our observations</p> <p>Traveling out FR or "trail" 9807, we encountered a sign Stating that behind the gated and fenced area which was on a steep slope, there is a riparian rehab area. How long has this area been studied? Can you please share information on the rehab project and its success/failure? It also would be helpful to know for these Allotments what vegetation "treatments", if any, have been conducted historically and how successful (or not) these actions have been.</p> <p>Further down the road, we encountered a second sign saying the same thing. However, the gate was closed but adjacent was a wide, open section inviting in off-road vehicles and others with a "trail" sign." The area is a wide, dry, sandy creek bed (Pine Creek?) and there was even a second sign marking the trail.</p> <p>Walking in the sandy wash we spied a huge, flat green area on a bench above the wash. Upon inspection, the green wasn't grass but forbs, primarily bindweed. There were numerous dried cow patties in this field.</p> <p>In the day and half spent out there in the field we could not locate another flat pasture area. In fact, everything was slopes, eroded gullies, and sandy washes. Is it possible to provide us with GPS coordinates or other directions that</p>	<p>This rehab area was closed to motor vehicle traffic and is the result of research by the Research Station and is outside the scope of this analysis.</p> <p>Travel management and trails were not part of the analysis.</p>

			<p>we might make another trip and find the pasture areas pictured in the EA?</p> <p>Nowhere did we find any biological soils with the exception of a small bit of green moss along Pine Creek on FR9821 B.</p> <p>We only found grass in the riparian areas of Pine Creek and Cottonwood Creek and in a small field above FR/Trail 666. That field was rife with small blue flowers, and I counted five types of grasses. The only other grasses seen in any of the areas we walked were blue grama. We would like to see the grasses growing but need directions to locations.</p> <p>We came upon one tank - on FR982 1 B under Brushy Mountain. The water was brackish and cow tracks were not recent.</p> <p>We are concerned that as stated on page 40 of the EA, that "By proposing the new range improvements analyzed under alternative 1, there is no commitment made that funding will be available from RBF to implement the project." We take this to mean that the additional cattle will be grazing but the improvements may not be made to accommodate the livestock leading to further downgrading of habitat, etc. In Alternative 1 you propose up to 16 new water sources. Where these improvements are needed to sustain the livestock and improve ecological conditions, you will need to construct these before allowing grazing in that pasture. And the same for fencing keeping the livestock from ingress or egress.</p>	<p>Comment is a statement of general observation and is noted</p> <p>The EA does not propose an increase in livestock numbers, however to improve distribution, new water developments are being proposed.</p> <p>As stated on page 40 of the EA. The allocation of range betterment funds each year is based on Forest priorities determined by leadership. By proposing the projects in this analysis, there is no guarantee that funds will be available to implement the project. However, if the projects are not implemented, it will likely affect the carrying capacity of the allotment.</p>
7	18	J. Cobb Great Old Broads for Wilderness	<p>In conclusion, Broads would like to see a better stated purpose and need, a proper range of alternatives, including a sustainable alternative for grazing on these allotments, and removal or substantiation of all comments where livestock grazing WILL improve conditions but removal of livestock MAY improve conditions. It is clear that grazing benefits the individual grazing permittee at the cost of the American taxpayer, but with good management and</p>	<p>Comment is a restatement of earlier comments. See above responses</p>

			consideration for the future in the light of climate change, a sustainable habitat can be provided for the whole community, including wildlife and recreational users	
8	1	T. Slaback Sierra Club	The preliminary Smith Canyon and Williamson Valley Grazing Allotments Management Environmental Assessment is in violation of the National Environmental Policy Act. NEPA requires that a range of alternatives be studied and that a "no action" alternative be included. In the EA, only two action alternatives are presented, a maximum grazing action and a remove all cows from the allotments action. This is not a "range" of alternatives, but only presents the preferred proposed alternative and one that would never be considered in reality. At a minimum, intermediate alternatives must be presented and studied. We propose a Sustainable Grazing Alternative be added to the EA Details are below. The removal of all cows is not a "no action" alternative, even though you list it as such. A "no action" is the continuation of the status quo. This alternative requires a new action be implemented. A true "no action" alternative is one that continues what is currently taking place. We believe that this would be the reissuing of the last grazing management plans and/or permits with no changes.	The National Environmental Policy Act requires a range of alternatives only for an Environmental Impact Statement (EIS). It is expected that a project analyzed under an EIS may have significant environmental impacts and therefore it would be important to consider alternative means of achieving the project's purpose. For an Environmental Assessment, there is no requirement for a range of alternatives, and Forest Service policy allows for there to be just one alternative, the proposed action, if there are no issues that would require an additional alternative. Forest Service Handbook direction for range analyses requires the consideration of a no grazing alternative as the no action alternative. There is no requirement to consider current management if it does not respond to an issue.
8	2	T. Slaback Sierra Club	The EA should present a cost benefit analysis for each studied alternative. This should include both direct and indirect costs associated with each plan. The PNF Forest Plan DEIS (pg. 172, table 51) states the "Present Net value of range is -\$4,361,383" (pg. 164) "about 74 percent of the Prescott NF is used for livestock grazing by permit holders on 62 of 68 total range allotments", and (pg. 174) "The benefit to permittees of public forage is approximately \$800,000 when compared to market price. The average private land grazing fee is \$9 per animal unit month (AUM) in Arizona, compared to \$1.35 per AUM for public land grazing (NASS, 201 1). If Prescott NF permittees had to replace their public land forage with private land forage,	The forest plan Page 4 states, "Livestock grazing is also a historical use of the forest which continues today across the forest's 68 allotments." and, "The overall goal of managing National Forest is to sustain the multiple uses of its resources in perpetuity, while maintaining the long term productivity of the land."

			<p>the annual cost of livestock grazing would increase over \$940,000."</p> <p>Therefore, the net cost for each active lease is: -\$4,361,383 (net range management cost) divided by 62 leases = -\$70,345 per lease total for 15 years. This is a direct subsidy to livestock growers. The multiple use policy may require some of the PNF to be grazed, but it does not require the PNF to take a loss.in doing so.</p>	
8	3	T. Slaback Sierra Club	<p>The preferred plan will require a very large financial input by the Prescott National Forest, of which it is stated that the water improvements will cost about \$20,000 each; and the fencing about \$12,000 per mile. This is many times the \$60,000-80,000 per year the PNF hopes to receive in Range Betterment Funds for the whole forest. Will the other plans throughout the forest be halted in order to fund this plan? There is no mention of a Plan B if these funds are not available. A plan B must include that if funds are not available for a specific project, then changes in the Allotment Management plan must be implemented; be it removal of all cows, a reduction in cow numbers, implementation of seasonal grazing, pasture rest, or other practices. If the first project is not done, no following projects can proceed. To whom go the benefits? It is not the American taxpayer. It is to a very few, select group of individual ranch owners. An individual beneficiary does not make a community, especially one that is to be socially and economically subsidized.</p>	<p>As stated on page 40 of the EA "The cost of constructing new range developments is typically shared between the agency and the grazing permit holder according to Forest Service policy as defined in the Forest Service Manual 2200, Chapter 2240. The costs stated by the commenter include labor that would be supplied by the permittee and the materials supplied by the Forest Service. The allocation of range betterment funds each year is based on Forest priorities determined by leadership. By proposing the projects in this analysis, there is no guarantee that funds will be available to implement the project. However, if the projects are not implemented, it will likely affect the carrying capacity of the allotment.</p>
8	4	T. Slaback Sierra Club	<p>The EA does not present a clear plan for how adaptive management will be conducted. In our scoping comments we asked the PNF to identify the authority in the FSM for implementing adaptive management, and we have received no response. Therefore we can only assume that no authority exists, and therefore a specific monitoring plan is required. The EA contains no specific monitoring plan with fixed time intervals. The management plan is therefore</p>	<p>Rangeland Management and Training Guide (6/97) defines adaptive management as the process of implementing a policy decision incrementally, so that changes can be made if the desired results are not being achieved. It is a process similar to the scientific experiment in that predictions and assumptions in management plans are tested, and experience and new scientific findings are used as</p>

		<p>inadequate. The EA should be rewritten to include the points we specified in our previous comments: We request that the EA include the following AM provisions :</p> <p>A clear statement of management objectives, desired conditions, current conditions, and necessary monitoring data must be presented. A summary matrix would be most helpful.</p> <p>The range of potential AM actions should be constrained and defined for each management objective. AM actions must not permit or create degradation. Management actions outside of the defined AM range may require NEPA analysis.</p> <p>A monitoring data collection plan is required. It should be funded and it should specifically describe the monitoring procedures, including the frequency, locations, and dates. The monitoring plan should be comprehensive enough to inform potential decisions.</p> <p>A monitoring workgroup should meet at regular specified intervals, or when circumstances require faster response, to review monitoring data, and to make recommendations for AM changes to the responsible official. A range of stakeholders should be represented in the working group, including the Sierra Club.</p> <p>Planned AM actions should include public notice and allow commenting before implementation. Self-monitoring by the permittee is unacceptable (similar to a fox guarding the hen house.) Local service and environmental groups are willing to help with the monitoring.</p> <p>Monitoring records must be maintained permanently in a form that is available for current and future public review. We found no mention of AM in Forest Service Manuals, but perhaps we may have overlooked such reference. We do not know if the lack of specific authority for AM is a problem or not. The EA should study this issue and explain within, the authority permitting AM and any conditions</p>	<p>the basis to improve resource management practices and future planning. Similarly the EA defines Adaptive Management, “. . . involves synthesizing existing knowledge, exploring alternative actions and making explicit forecasts about their outcomes.”</p> <p>Desired conditions and objectives, along with current conditions are in specialists reports (Range-Vegetation, Soils, Hydrology, Wildlife, Heritage, and Recreation).</p> <p>Monitoring approach conforms to Forest Service standards and is outlined in the EA page 10.</p> <p>Monitoring approach conforms to Forest Service standards and is outlined in the EA page 10.</p> <p>Public notification will follow Forest Service policies</p> <p>Records are on file in Allotment files at district ranger offices in accordance with Forest Service protocols</p>
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			that the USFS requires.	
8	5	T. Slaback Sierra Club	The EA presents that the preferred alternative "will" result in many improvement benefits to the land, but the removal of cow grazing "may" result in improvements. If you choose the preferred alternative, prove that grazing will result in land improvement. The way to do this is to establish landscape scale exclosures of at least a mile square for each of the studied Terrestrial Ecosystem Survey Units. Then intensely monitor them and compare to the equivalent grazed TEUTs to see which results in the greatest improvement. This should be presented in the EA as part of the preferred alternative.	Comment is a statement of general opinion and is noted
8	6	T. Slaback Sierra Club	The EA should include the assessment of what effect cow grazing will have on the bio-crust. The EA is negligent in its omission to consider and evaluate biological soil crusts. Biological soil crusts perform critical and valuable environmental functions including soil stability, water infiltration , seed germination, plant growth, and essential nutrient transportation (including nitrogen and phosphorous); all of which are factors in short supply in these allotment pastures. The EA needs to be written with the addition describing the deviation from desired and/or natural conditions of the biological soil crusts in each pasture TEUI. The allotment management plan must state the commitment of the PNF to protect and restore the biological soil crusts.	A complete analysis of the environmental effects of the proposed action as well as the no action alternative on the soil resource are provided in the draft environmental assessment

8	7	T. Slaback Sierra Club	<p>The data collected on the individual pastures is found in many different places in the EA (leading to some confusion as some pastures have multiple TEUTs (found in different parts of the EA) and there are pastures with the same name in the two different allotments. Some data is not available in the document for some pastures. To better understand the complete pasture picture it would be preferable to have an integrated data table in the EA, rather than to have to keep thumbing through the document and trying to remember what all of the data consisted of for one pasture . We have created for you such a table, Table A. which we have included. Table A's final column is whether the PNF views these TEUJs as meeting or not meeting desired conditions. PNF management actions are required to move forest resources towards these desired conditions. The EA does not specifically connect the proposed allotment management actions with moving towards the desired conditions. Statements similar to that on pg. 7: "Project design feature is to implement incidental use (0-30%) in the no capacity areas of TEUI 486." are vague and inadequate. No monitoring intervals or methods are discussed.</p>	<p>Specialist's reports identify which areas are not meeting desired conditions and identifies measures to move these toward desired conditions. Page 6 – 8 of the EA describes these situations.</p> <p>Page 6 states, "Resource protection measures will be incorporated into the project as design features to protect forest resources such as soil, vegetation, and riparian habitats; as well as to maintain or <u>make progress toward desired conditions</u>. Best Management Practices will be implemented to comply with the Clean Water Act.</p>
8	8	T. Slaback Sierra Club	<p>From May 30 to 31 we visited pastures on the SC/WV grazing allotments. We would have liked to visit the TEUIs shown and analyzed in the EA. However, there were no useful maps (even with a magnifying glass they were illegible) or directions to the locations. The maps did not even show the road system on these forest areas. We were only able to approximately visit sites by comparing the EA section numbers to USGS topographic maps and the PNF forest map section numbers. The sites analyzed in the EA should be presented on a map along with their GPS coordinates. Therefore, the EA does not adequately describe the project and the EA should be withdrawn and rewritten to include improved maps with GPS co-ordinates and location descriptions of the pasture TEUIs and water</p>	<p>Pastures look different in different seasons, and after grazing has occurred. Photos and inventories are from end of growing season and in pastures that have not been grazed when possible.</p>

			<p>projects. The proposed water projects, some of them shown on the map as being within a one mile square area are too large to determine their location and suitability. Their locations should be analyzed in the EA We would have liked to see areas such as represented in photo #9 on the Tailholt pasture. Instead what we found, in walking many miles and driving what could charitably be called jeep trails, was predominately bare soil (lacking in biological activity), without a grass component, on moderate to very steep slopes that were eroding away into gullies from a few feet in depth to over our heads. The PNF should conduct a public field tour of the allotments, to include both satisfactory and unsatisfactory pasture sites.</p>	
8	9	T. Slaback Sierra Club	<p>It is stated on pg. 15 that water improvements "will" benefit wildlife. For eons wildlife have got along just fine without the use of grazing water sources, many being able to obtain the water they need by metabolism of their food source. Such water improvements can be detrimental to wildlife. They provide a place for predators (both animal and human hunters) to hang out at, in wait for prey.</p>	Noted
8	10	T. Slaback Sierra Club	<p>The plan calls for 20 new water developments. The EA does not discuss the amount of water to be withdrawn or caught that recharges the Big Chino Aquifer via the Williamson Valley watershed and the amount of water that will be lost to the Bill Williams Watershed (Sycamore Creek.) A hotter and dryer climate will expedite this loss. On average, a cow consumes 23 gallons of water per day. Climate change studies must be included in the EA to address the effects on our aquifers and stream and river flows. We have observed that the majority of waterways on these allotments are now only washes, barren of riparian habitat. What will happen to the small areas of the upper portions of Pine Creek and Cottonwood Creek that still have flowing water? What will happen to the springs and seeps that source these ground flows? In our previous</p>	<p>Comment of opinion is noted and considered by the Deciding Official.</p> <p>The EA on page 3 references the Forest Plan and directs the reader to a website where the plan can be viewed. This analysis was conducted by an interdisciplinary team of resource specialists that evaluated whether current resource conditions were meeting Forest Plan standards, guidelines, and objectives as well as project specific desired conditions. The Vegetation and Range Management specialist reports evaluate long-term trends in vegetation since condition evaluations were first conducted in the 1960s. Page 18 of the EA states how trend is used to determine Rangeland</p>

			<p>scoping comments, we requested an analysis of how grazing affects climate change. This is required by the USFS and must be included in the EA: "Climate Change. In coming decades, climate change will stress regional ecosystems with increasing temperatures, lower precipitation, increased variability and intensity of precipitation, increased insect pressure, and wildfire. These factors have synergistic effects on tree mortality and all vegetation, thus threatening the very existence of forests in our region. Since climate change will increase stress on vegetation, balancing grazing management with achieving soil health objectives becomes very challenging. In the Strategic Plan FY 2010-2015 (http://www.ocfo.usda.gov/usdasp/sp2010/sp2010pdf), USDA lists "Strategic Goal 2: Ensure Our National Forests and Private Working Lands Are Conserved, Restored, and Made More Resilient to Climate Change, While Enhancing Our Water Resources." USFS concern for climate change is reflected in the report "National Roadmap for Responding to Climate Change (July 2010) that outlines a broad agency approach. This should be explicitly analyzed in the EA."</p>	<p>Management Status.</p>
8	11	T. Slaback Sierra Club	<p>The EA states that the only direct harm that cow grazing will cause to aquatic dependent wildlife is if they happen to step on them. This statement also applies to all the other plants and animals reviewed in the EA. This is ludicrous. The cumulative indirect impacts are where the harm comes into play. Silt from upland erosion smothers the stream bottom substrate required for wildlife reproduction, banks are trampled, widening of the water course, lessening of bank water retention, germinating plants are eaten, doing away with shade effect, reducing habitat for terrestrial animals and increasing water and soil temperature with the loss of flowing water resulting in the conversion to washes, which are then prone to erosion and gullyng. The No Grazing alternative then states that there will be no direct effects. The direct effect will be an improvement in all the</p>	<p>Comment of opinion is noted and considered by the Deciding Official.</p>

			aspects of plant life, animal life, land, and water conditions listed on pp. 57-66. The language of the statements on these pages is highly biased in favor of livestock grazing. If the proposed water projects are not funded, or the cows stay in the riparian areas, the grazing must be terminated.	
8	12	T. Slaback Sierra Club	On page 16 mention is made of vegetation treatments (thinning and burning) on the Smith Canyon Allotment, but none on poisoning. However, 25-30 years ago on a tour of the area for a large treatment on Tank Creek and Sycamore Mesas, we drove across Smith Mesa and viewed many standing ghost juniper skeletons. On inquiry, the PNF informed us that it was from a former (possibly late 1960s) chemical treatment with picloram. Picloram has an affinity for water and has been found to contaminate groundwater throughout the US. It is considered to be a carcinogen.	Picloram treatments are not proposed in this environmental analysis. Vegetation treatments are outside the scope of this analysis.
8	13	T. Slaback Sierra Club	<p>We assume that on page 57 you are referring to coliform bacteria, not fecal “chloroform.” This same section states that there will be no cumulative impacts from the project area to the Verde River below Sycamore Creek to a point downstream from Camp Verde.</p> <p>The cumulative impacts to the Verde River should be studied for the area above Sycamore Creek, on the PNF, that is being managed to conserve its outstanding resource values until such a time that Congress determines whether there will be a Wild and Scenic designation for this stretch of the river.</p>	<p>Text of the Environmental Assessment has been modified to read “coliform.”</p> <p>The statement “No cumulative impacts from the project area are anticipated to this reach on the Verde River” is referring to the reach from the inception of the Verde River south of Paulden to below Camp Verde. Cumulative impacts of the proposed action were assessed for the entire stretch of the Verde River downstream to Camp Verde. This particular reach, below Sycamore Creek, was only specifically described due to its proximity to the Total Maximum Daily Load for turbidity below Camp Verde. Additional information is provided in the Hydrology specialist report.</p>
8	14	T. Slaback Sierra Club	The EA states on page 36, Invasive Plant Species, that noxious weeds will not be discussed because it is addressed in the Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds, Coconino,	The spread and treatments for invasive plants are addressed in other efforts and are outside the scope of this analysis.

			<p>Kaibab, and Prescott National Forests within Coconino, Gila, Mohave, and Yavapai Counties, Arizona. It is a known fact that cows are a leading spreader of noxious, invasive, and non-native plant species onto our public lands, and once established they are very difficult and costly to eradicate. The EA should specify how this problem will be stopped on the studied allotments. One method that could be employed is to require the permittee to keep an area 100 feet in diameter clear of noxious and invasive plants surrounding all grazing water sources.</p>	
8	15	T. Slaback Sierra Club	<p>The EA indicates that the area receives very little recreation. We entered the area on the afternoon of Memorial day. There was a steady stream of pickups and trailers loaded with off road vehicles leaving for home, and one pickup carrying an ORV passed us entering the area in a cloud of dust. The next morning there were about two dozen Baja style off road racing vehicles entering the area at speed</p> <p>There were dozens of user created campsites near the Camp Wood to Walnut Creek Road along Pine Creek. There were many more on the way to the Seven Up junction and along the Pine Creek west of Hyde and Pine Mountains. The EA also states that cow grazing has no adverse impacts to recreation. This is based on the statement that the PNF has never received a written complaint or account of a negative experience due to cow grazing from a recreationist in this area. Just because no one has filed such a complaint, it does not mean that there are no impacts. We highly doubt that the public knows that the PNF is seeking such reports and they would not know how to submit one. The PNF should notify the public that they are requesting such information in the acquisition of data for grazing allotment management planning. We will supply you with one here: it is not desirable to camp in an area where cows are grazing in a dispersed recreation site due to the noise, smell, increase in insects, cow pies</p>	<p>Travel management and Recreation impacts are outside the scope of this analysis.</p> <p>The forest plan Page 4 states “Livestock grazing is also a historical use of the forest which continues today across the forest’s 68 allotments.” and, “The overall goal of managing National Forest is to sustain the multiple uses of its resources in perpetuity, while maintaining the long term productivity of the land.”</p>

			littering the landscape (making you wish you had brought your rubber boots), cow poop and urine in the limited areas of flowing water, reduction in green and flowering plants, and in one case the mastication of the center of a rainfly requiring its replacement.	
8	16	T. Slaback Sierra Club	By your own account (pp. 67-68), the inventory for heritage sites is only undertaken when there is a project to be constructed. This means that the large majority of the grazing allotments have never been inventoried for heritage sites. A cow cannot recognize a heritage site and will walk right through one, potentially causing damage to the site. There may not be an increase in impacts from the implementation of the preferred alternative, but the trampling will continue, and it will now be occurring in areas that have not been grazed in the past due to environmental conditions that formerly discouraged cow entry for grazing.	Comment of opinion is noted and considered by the Deciding Official.
8	17	T. Slaback Sierra Club	For additional analysis to be included in the EA The Sustainable Grazing Alternative : 1 .Any pasture found to not be meeting Desired Condition, or having an ET cover less than that established for its TEUI, or having an ET species composition less than that established for its TEUI, or does not have that data available (several pastures are missing this data in the EA), or soil is impaired or in unsatisfactory conditions, or whose watershed is in at risk or impaired function, or any combination of the preceding will not be grazed until such conditions are satisfactory or functioning properly. (Refer to our Table A) Grazing is to be implemented on a seasonal basis. There will be intense monitoring of each growing season. Within the first 5 years of monitoring there must be a statistically significant trend towards the achievement of the desired conditions in those areas where they are not currently being met. Exclosures of ecosystem size (minimum 1 square mile)	Current conditions are summarized on pages 4 & 5 of EA and site specific resource protection measures are outlined on pages 7 & 8. Data for those sites are contained in specialists reports. Comment of opinion is noted and considered by the Deciding Official.

			will be created for each pasture TEUI type. They will be monitored along with the grazed portions of the same pasture TEUI type in order to create a long term comparison in how each affects the overall ecosystem health.	
8	18	T. Slaback Sierra Club	<p>In conclusion , we find the EA to be inadequate and request that it be withdrawn until the fore• mentioned problems are corrected, including:</p> <ol style="list-style-type: none"> 1. Provide a no-action alternative and other intermediate alternatives, including a Sustainable Grazing Alternative. Describe funding for improvements and require that such improvements be installed before grazing is permitted in those pastures. <p>Evaluate the biological soil crusts. Improve the mapping and provide GPS locations for pasture TEUIs, water projects, and fencing, including route directions. Evaluate the amount of water to be consumed by the new developments. Evaluate the cumulative indirect impacts of grazing on riparian areas. Improve noxious and invasive weed control provisions. Evaluate the effects grazing causes to climate change. Analyze an improved monitoring plan.</p> <p>When it is both capable and suitable, public lands may be grazed if they are sustainable. Grazing of public lands is a privilege, not a right.</p>	<p>Required alternatives have been analyzed. Comment of opinion is noted and considered by the Deciding Official.</p>