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Environmental Assessment

Chino Small Grazing Allotments Management

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



**Key Area on the Quartz Mountain Allotment in TEUI 417; photo taken
in November 2014**

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1. Introduction

We are proposing to create allotment management plans for four allotments on the Chino Valley Ranger District of the Prescott National Forest. The four allotments are Hitt Wash, Old Camp/Jordan, Quartz Wash, and Yolo South. The project area is collectively referred to as the “Chino Small Allotments”. 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 Chino Small Allotments are located on the Chino Valley Ranger District of the Prescott National Forest (PNF) and represents the project area for this analysis, an area of approximately 22,100 acres of National Forest System land. The location of the allotments is shown on the map in Appendix 1.

The Hitt Wash Allotment is located approximately 15 miles northwest of Chino Valley. The allotment comprises approximately 5,500 acres and has three pastures: North, South, and B.Y. The predominant ecotype is pinyon-juniper (PJ) chaparral. Elevation ranges from about 4,700' to over 5,300'. Hitt Wash is the major drainage on the allotment, although most of it occurs on private land. It is ephemeral, meaning it only flows for short periods after precipitation events. The current term grazing permit allows for up to 64 adult cattle to graze from 11/1 through 4/15 in a seasonal grazing system.

The Old Camp Allotment adjoins the Hitt Wash Allotment to the south. The Jordan Pasture located at the north end of the allotment has been used for the last four years, and this analysis would allow for the pasture to be added permanently. The newly combined allotment will be called the Old Camp Allotment, and the Jordan Pasture would be renamed the North Pasture of the Old Camp Allotment. The new allotment configuration would consist of four main pastures: North, West, East, and South, and one holding pasture adjacent to the headquarters, Jordan holding pasture. The allotment comprises about 6,200 acres with elevations ranging from approximately 4,700' to 5,500'. Williamson Valley Wash is an ephemeral drainage that crosses the North Pasture and Horse Wash crosses the West and East Pastures. The predominant vegetation type is PJ-chaparral. The current term grazing permit allows for up to 45 adult cattle to graze yearlong.

The Quartz Wash Allotment is located approximately 15 miles northwest of Paulden. The allotment comprises approximately 6,900 acres in a corner of the Prescott National Forest adjacent to private land on the east and south, private and Arizona State Trust on the north, and the K Four allotment on the west. There are three pastures on the allotment: Quartz, Center, and Fritsche. The predominant ecotypes are pinyon-juniper woodland and PJ-chaparral. The current term grazing permit allows for up to 75 adult cattle to graze yearlong, but in recent years the allotment has been authorized for grazing only during the dormant season from 11/1 to 5/31 by up to 75 adult cattle.

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

The Yolo South Allotment is located in the southwestern portion of the Chino Valley Ranger District, approximately 15 miles northeast of Bagdad. The allotment comprises approximately 3,500 acres. It is adjacent to private land and Arizona State Trust land. There are no interior division fences on the allotment, but Moonshine Canyon forms a natural barrier at the north-central portion of the allotment. Livestock typically use only the area south of Moonshine Canyon and do not graze on South Mesa north of Moonshine Canyon due to lack of water. The predominant vegetation type is pinyon-juniper woodland. Loco Creek and its tributary Moonshine Canyon traverse the allotment in deep rugged canyons. The predominant vegetation types are interior chaparral and PJ-chaparral. The current term grazing permit allows for up to 162 cattle to graze a variable 4 month season. The variable season has been primarily in the fall to spring timeframe, but some summer seasonal use has also occurred in the past.

Precipitation in the project area is bi-modal with monsoon events occurring during the summer and a period of precipitation occurring within the winter season and a high degree of variation from year to year. Average annual precipitation across the allotments varies with elevation and ranges from approximately 12 inches at the lower elevations to 18 inches at the upper elevations.

1.2 How is Grazing Managed on the Prescott National Forest?

This Environmental Assessment (EA) is based upon background information about the allotment including current and past inventory and monitoring data, the desired condition of resources on the allotment derived from direction and guidelines in the Prescott NF Land and Resource Management Plan (Forest Plan), as well as from resource specialists' knowledge of the allotment. The Forest Plan is in the final stages of revision and will be completed in 2015. This project is utilizing the direction in the new plan related to desired resource conditions and rangeland management. You can find the latest version of the revised Forest Plan on the internet at: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5385346.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 four allotments comprising the project area that are consistent with the Forest Plan and will allow for desired resource conditions to be met. The Old Camp Allotment has an AMP in place approved in the 1990s but it did not include the addition of the Jordan Pasture. To make this a permanent change requires a new analysis. The Yolo South Allotment has an AMP dated from 1978 but no environmental analysis appears to have been completed for it. The Hitt Wash Allotment has an AMP from 1966 that pre-dates the National Environmental Policy Act (NEPA), and the Quartz Wash Allotment has no AMP. Allotments with no AMP have been managed in the past by

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

issuing operating instructions on an annual basis. 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 areas on the allotments where soil conditions could be improved, and some areas where the vegetation is not meeting desired conditions.

2.2 Why Is There a Need for this Proposal?

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 four allotments:

Hitt Wash: There is impaired soil condition in some parts of soil map unit TEUI³ 481 in the B.Y. Pasture. There are areas of satisfactory condition in this soil map unit on hillslopes where vegetative cover is within site potential, but valley bottoms in TEUI 481 have severe compaction and poor vegetation distribution. The management objective for TEUI 481 in the B.Y. Pasture is to maintain vegetation cover and spatial distribution and promote retention of litter within the areas between plants on hillslopes, and to improve vegetative cover and distribution and decrease compaction in valley bottoms. Vegetation is meeting desired conditions for the species composition and canopy cover of perennial grasses in key areas. There is also a need to distribute livestock more evenly on the allotment by providing additional reliable water sources or through fencing.

Old Camp: There are areas of unsatisfactory soil condition in TEUI 461 in the South Pasture. This map unit has variable overstory cover of juniper that in some places is so dense as to inhibit herbaceous plant growth. In areas with absent or reduced herbaceous understory there is extensive sheet erosion with some rilling and active gulying. The management objective for TEUI 461 in the South Pasture is to promote management activities that do not exacerbate a decline in soil function. There are areas of unsatisfactory soil condition in the East Pasture in TEUI 434 where dense juniper and the loss of perennial grass cover has resulted in widespread accelerated erosion in the form of active gulying, rilling, and sheet erosion. The management objective for TEUI 434 in the South Pasture is to promote management activities that do not exacerbate a decline in soil function. The amount of perennial grass cover and species composition is not meeting desired conditions in the key area in the East Pasture. There are areas of impaired soil condition in TEUI 481 in the North Pasture. The soil map unit is a mixture of impaired and satisfactory condition. There are indications of active soil loss, compaction, and decreased nutrient cycling in the impaired portions of the soil map unit. The management objective is to maintain vegetation cover and spatial distribution and promote the retention of litter within the plant interspaces, and reduce the level of soil compaction. Vegetation is meeting desired conditions in the North, West, and South Pastures. There is a need to provide reliable water sources on the allotment to improve livestock distribution.

Quartz Wash: The soil map unit TEUI 412 in both the Center and Fritsche Pasture is in unsatisfactory condition as evidenced by significant compaction and poor vegetation cover and distribution. The management objective is to improve the vegetative groundcover towards site potential, reduce spatial distance (gap) between herbaceous plants, and reduce soil compaction. The perennial grasses in the Center Pasture in TEUI 412 are also not meeting desired condition of mid-similarity to potential species composition and cover. There is a need to provide additional water in the Quartz Wash Pasture and Center Pasture to better distribute

³ TEUI stands for Terrestrial Ecosystem Unit Inventory and it is an integrated representation of soil, climate, and vegetation as modified by geology, geomorphology, landform, and disturbance processes.

livestock use. There is also a need to protect riparian vegetation in Walnut Creek from over-use by livestock.

Yolo South: Soil condition is not meeting desired conditions in the northern portion of the allotment in TEUI 461 where the density of juniper cover is limiting the establishment of perennial grasses. There are no juniper thinning treatments proposed in this analysis. The management objective for soil is to promote management activities that do not exacerbate a decline in soil function. There is also a need to protect riparian vegetation at Laurel Spring that is used as a watering source for livestock. There is a need to provide a water source in the portion of the allotment north of Moonshine Canyon if it is ever grazed by livestock.

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 Chino Small Allotments under the following terms:

Hitt Wash Allotment: Issue a term grazing permit to authorize seasonal grazing from November 1st through April 15th for a range of cattle numbers typically between 64 and 110 adult cattle. Under adaptive management, less than 64 cattle may be authorized in a given season depending on resource conditions and forage and water availability. The total authorization in a given season would not exceed 605 AUMs⁴. Livestock would be rotated through the two main pastures, North and South, during the seasonal use period. The third pasture, B.Y., would be used for one month during the season, either in November or early December, or mid-March to mid-April to avoid using the pasture when soils are wet.

Old Camp/Jordan combined allotment: The allotment will be renamed the Old Camp Allotment and will consist of 4 main pastures: North, West, East, and South, and a smaller holding pasture named the Jordan pasture. A term grazing permit would be issued to authorize up to 45 head of adult cattle yearlong, or up to 540 AUMs. The typical range of stocking is between 30-45 head of adult cattle yearlong. Under adaptive management, less than 45 cattle may be authorized in a given year depending on resource conditions and forage and water availability. The pastures would be grazed in a deferred rotation grazing system whereby growing season rest or deferment is provided in each pasture.

Quartz Wash Allotment: Issue a term grazing permit to authorize seasonal grazing from November 1st through May 31st for a range of cattle numbers typically between 75-125 adult cattle. Under adaptive management, less than 75 cattle may be authorized in a given season depending on resource conditions and forage and water availability. The total authorization in a given season would not exceed 875 AUMs. The three pastures on the allotment are the Quartz, Center, and Fritsche pastures and they would be used in a deferred rotation grazing system to give pastures some deferment while cool-season plants are actively growing. Pastures would receive warm-growing season rest every year.

Yolo South Allotment: Issue a term grazing permit to authorize variable seasonal grazing for no more than 4 months a year by a range of livestock numbers from 40-60 adult cattle. Under

⁴ An AUM is an Animal Unit Month, defined as a measure of the average amount of forage consumed by one cow-calf pair over the course of one month.

adaptive management, less than 40 cattle may be authorized in a given season depending on resource conditions and forage and water availability. The total authorization in a given season would not exceed 240 AUMs. The allotment does not have interior pasture fencing, but natural barriers divide the allotment at Moonshine Canyon. Cattle currently use the area south of Moonshine Canyon only, while the area north of the canyon could potentially support 20-30 head for 4 months if water were developed and some juniper thinning treatments were conducted. No vegetation treatments are being proposed in this analysis. The season of use will be varied on the allotment to provide for growing season rest and deferment.

The term grazing permits for these four 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 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. Grazing use or intensity is the degree to which forage is removed through grazing and trampling by livestock and it is determined by measuring the level of utilization on forage plants after the growing season, or relative utilization during the growing season. 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.

Best Management Practices

Best Management Practices (BMPs) are a practice or combination of practices determined to be the most effective, practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals, and are developed to comply with the Clean Water Act (FSH 2509.22_10.5). The Interdisciplinary Team followed the guidance in the Southwest Region Forest Service Handbook 2509.22, Chapter 20,

and the National Core BMP Technical Guide, FS-990a, in the formulation of resource protection measures related to range management that also function as BMPs to address water quality and watershed concerns.

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 use guidelines. Grazing use or intensity is measured by determining the level of utilization on forage plants after the growing season, or relative utilization during the growing season. Utilization is the proportion or degree of current year's forage production that is consumed or destroyed by animals (Interagency Technical Reference 1996). 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 (2000⁵, 2004⁶) provide a comprehensive review of studies related to residual leaf lengths on southwestern forage species and growth forms as indicators of grazing intensity. They concluded that grazing at moderate or conservative intensities will generally result in maintaining or improving rangeland conditions over time. 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:

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.

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

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

Hitt Wash: To achieve improvement in soil condition, the B.Y. Pasture will only be grazed for a one month period from either 11/1 to 12/15 or from 3/15 to 4/15. This will minimize further soil compaction by limiting use when soils are normally wet. Additionally, no salting or supplementation would occur in valley bottoms to discourage concentrated livestock use. Existing gullies in TEUI 481 in both B.Y. Pasture and at the southern end of the North Pasture may be treated by cutting adjacent juniper trees and piling in the gully or using rocks to create small structures to trap and retain sediment. The overall soil condition in the North Pasture is satisfactory; however, there are localized small gullies in TEUI 481 where further degradation could be prevented through gully treatments.

Old Camp: The management objective for TEUI 461 in the South Pasture is to promote management activities that do not exacerbate a decline in soil function. Conservative utilization levels (35-45%) would allow for retention of vegetative cover and provide for sustained plant health. Providing growing season deferment by managing the pasture rotation schedule would also provide for the health of existing herbaceous plants. No juniper thinning treatments are being proposed in this analysis, so areas of dense juniper are likely to remain in a stable state in regards to herbaceous plant cover. Existing gullies in TEUI 461 may be treated by cutting adjacent juniper trees and piling in the gully or using rocks to create small structures to trap and retain sediment.

The management objective for TEUI 434 in the East Pasture is to promote management activities that do not exacerbate a decline in soil function. Conservative utilization levels (35-45%) would allow for the retention of 55-65% of the herbaceous plant cover and provide for sustaining the health and vigor of the herbaceous plants. Existing gullies in TEUI 434 in the South Pasture may be treated by cutting adjacent juniper trees and piling in the gully or using rocks to create small structures to trap and retain sediment. To achieve improvement in perennial grass cover, conservative utilization levels are proposed and a rotation system would be employed to provide growing season deferment. The prescribed utilization levels will allow for retention of 55-65% of vegetative biomass to promote improved water infiltration and nutrient cycling.

The management objective for TEUI 481 in the North Pasture is to maintain vegetation cover and spatial distribution and promote the retention of litter within the plant interspaces, and reduce the level of soil compaction. Concentrated cattle use in TEUI 481 should be avoided by not placing salt or supplement in these areas, and the pasture should not be used when soils are wet (winter, early spring). Existing gullies in TEUI 481 in the North Pasture may be treated by cutting adjacent juniper trees and piling in the gully or using rocks to create small structures to trap and retain sediment.

Quartz Wash: The management objective for TEUI 412 in the Center and Fritsche Pastures is to improve the vegetative groundcover towards site potential, reduce spatial distance (gap) between herbaceous plants, and reduce soil compaction. To achieve these objectives, incidental use of 0-30% would be allowed in this soil map unit until satisfactory progress towards groundcover objectives had been achieved. There will be no salting or supplementation allowed in this soil map unit, and use would be discouraged when soils are wet (typically mid-December through mid-March). Complete rest would be incorporated to allow freeze/thaw and wet/dry cycles to break up compaction and allow accumulation and incorporation of soil organic matter. Although the cover and species composition shows mid-similarity to the potential plant community in TEUI 412 in the Center and Fritsche Pastures, the vegetation condition is trending down. Promoting incidental use (0-30%) in TEUI 412 in both the Center and Fritsche Pastures

and incorporating rest should improve the vigor and abundance of perennial grasses and provide for an upward trend..

An adjacent grazing allotment trails cattle through the Quartz Wash Allotment using Forest Roads 9878A and 664. Cattle are being herded through TEUI 412 where there are concerns with soil condition and compaction. If it is determined that the continuation of trailing through the allotment is preventing soils in TEUI 412 from improving and moving towards desired conditions, then the practice of trailing through the allotment would be discontinued. Currently cattle trail through in two bands during the October-November timeframe when soils are typically dry.

In the event that monitoring of the riparian vegetation at Walnut Creek shows that allowable use levels are often exceeded, and the riparian vegetation is not able to meet desired condition, then a fence would be constructed to exclude cattle from Walnut Creek at the southern end of the Center Pasture. Additionally there are portions of Walnut Creek in sections 13 and 7 that lie outside the allotment boundary but are accessible from private lands to the south that are grazed by cattle. To protect the riparian resources on Forest system lands, a fence would be built that would exclude cattle from accessing Walnut Creek from adjacent private land. Livestock would not be authorized to graze these parts of Walnut Creek from the Quartz Wash Allotment either.

Yolo South: The management objective for soil in TEUI 461 is to promote management activities that do not exacerbate a decline in soil function. This would include having conservative use levels on perennial grasses of 35-45% to allow for the maintenance of plant health and promote litter retention. This soil map unit is in an area that is not currently grazed because it is separated by natural barrier from any available water. Absent any vegetation treatment, the vegetation and soil conditions are likely to remain stable or further decline as juniper density increases. The proposed level of authorization of 40-60 cattle for 4 months represents a significant decrease in stocking from the current term grazing permit that allows for up to 162 cattle for 4 months.

To protect riparian vegetation at Laurel Spring, the spring source would be fenced, and water would be piped from the source to an area outside the fence that is suitable to receive concentrated livestock use (typically a flat location that would not be in a highly erosive soil type).

On the Chino Small Allotments there is no occurrence of species or habitat that is protected under the Endangered Species Act as federally-listed or proposed for listing. There are Regional Forester sensitive species or habitat present. Habitat considerations for other wildlife species of concern will be considered in this analysis.

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. Hitt Wash:

- Construct a well in the vicinity of Samson Tank (a currently unreliable water source).
- Change fence configuration between the North and South Pasture to use Rocky Tank as a water source for both pastures.
- Make the existing water haul location in the B.Y. Pasture a permanent water source by drilling a well in the vicinity of the existing storage tank.
- Construct a pasture division fence in the North Pasture that would roughly split the pasture into east and west sections. This would provide for better distribution of livestock and allow for additional deferred rotation opportunities among three main pastures.
- When allotment boundary fences are due to be reconstructed, make sure the new fence is constructed on surveyed property boundary lines. All newly constructed fences would incorporate wildlife-friendly fence design.

Old Camp:

- Provide additional water sources in each pasture: Construct a well, storage tank, and troughs in the North Pasture in the north half of section 6; Construct water catchment aprons, storage tanks, and troughs (trick tanks) in the following locations: West Pasture, the center of section 18; East Pasture, the SW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of section 20; South Pasture, the center of section 30.

Quartz Wash:

- Construct a water catchment, storage tank, and trough (trick tank) in the north half of section 15 in the Quartz Pasture; provide an additional water source in the Center Pasture by laying a pipeline from the Quartz Pasture trick tank to section 14 in the southern part of the Center Pasture. Additional water storage and a trough would be provided at this location. Fence accessible portions of Walnut Creek if grazing management adjustments in timing and season of use do not adequately provide for attainment of desired condition in the riparian area.
- Portions of Walnut Creek in sections 13 and 7 that lie outside the allotment boundary but are accessible from private lands to the south that are grazed by cattle. To protect the riparian resources on Forest system lands, a fence would be built that would exclude cattle from accessing Walnut Creek from adjacent private land. These excluded sections of Walnut Creek would not be used by the Quartz Wash Allotment livestock.

Yolo South:

- Fence Laurel Spring riparian vegetation and provide a pipeline and trough outside of the riparian zone to water livestock.
- Provide an additional water source (likely a water catchment apron, storage tank, and trough) north of Moonshine Canyon if grazing capacity is created due to juniper thinning (not being analyzed here).

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. All improvements identified on allotment maps have been evaluated and determined necessary to the management of the allotment through the life of this plan.

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. The permittee may conduct road maintenance activities on forest system roads and trails to facilitate access to or maintenance of improvements. Maintenance will be done to Forest Service standards and permitted under a road use permit.

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. Monitoring activities would be focused on those resources that need improvement or where there is a concern for an important habitat type.

2.4 What Other Alternatives Are Being Considered?

Alternative 2 – Seasonal Grazing on the Old Camp Allotment

This alternative is identical to Alternative 1 except for the authorization for the Old Camp Allotment that would be amended as follows:

Old Camp/Jordan combined allotment: The allotment will be renamed the Old Camp Allotment and will consist of 4 main pastures: North, West, East, and South, and a smaller holding pasture named the Jordan pasture. A term grazing permit would be issued to authorize seasonal grazing during the dormant season, typically October through April. The number of cattle authorized seasonally would not exceed 540 AUMs, or about 77 adult cattle for 7 months. Under adaptive management, less than 540 AUMs may be authorized in a given season depending on resource conditions and forage and water availability. The pastures would be grazed in a deferred rotation grazing system whereby cool-season deferment is provided in each pasture. Each pasture would receive warm growing season rest every year. There may be less need for new water developments in each pasture if they are grazed during the winter, but the 4 new water developments proposed in Alternative 1 will be included in this alternative as well. Utilization levels will be the same as Alternative 1, 35-45% use on perennial grasses.

Alternative 3 is the No Action/No Grazing Alternative required by Forest Service policy⁷.

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

Cancellation of the Grazing Permit: Livestock grazing on the Chino Small Allotments would be discontinued and the Term Grazing permit would be cancelled after a 2-year notification to the permit holder (FSM 2231.62d/FSH 2209.13-16.24). 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.

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 Chino Small 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. The economic and social effects of the alternatives will also be considered.

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

⁷ FSH 2209.13, Chapter 90, Section 92.31

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 Chino Small Allotments

	Alternatives 1 Proposed Action	Alternative 2, Seasonal Grazing Old Camp Allotment	Alternative 3 No Action/ No Grazing
Authorization (AUMs, Season of Use & Term)	Hitt Wash: Seasonal grazing from 11/1 – 4/15 by between 64-110 adult cattle; Old Camp: Yearlong grazing by up to 45 adult cattle; Quartz Wash: Seasonal grazing from 11/1 – 5/31 by between 75-125 adult cattle; Yolo South: Seasonal grazing for 4 months by between 40-60 adult cattle.	Same as alternative 1 except Old Camp Allotment – seasonal grazing from 10/1 - 4/30 by up to 77 adult cattle.	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	Same as alternative 1	N/A

	Alternatives 1 Proposed Action	Alternative 2, Seasonal Grazing Old Camp Allotment	Alternative 3 No Action/ No Grazing
	areas as measured at the end of the grazing season, and up to 50-60% browse use on key upland woody species; Quartz Wash – light use from 0-30% in areas needing improvement in TEUI 412 in center and Fritsche Pastures.		
New Improvements	Provide up to 9 new water developments in the project area; fence and develop Laurel Spring; construct about 5 miles of new fence, including fence to exclude Walnut Creek	Same as alternative 1	No new range developments constructed. Fencing of Walnut Creek where it abuts private land could be implemented to protect riparian areas from trespass grazing.
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.	Same as alternative 1	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	Same as alternative 1	Monitoring of non-use compliance.

	Alternatives 1 Proposed Action	Alternative 2, Seasonal Grazing Old Camp Allotment	Alternative 3 No Action/ No Grazing
Upland Vegetation Effects	Dormant season grazing will give full growing season rest to all warm season grasses, and rest during seed set for cool-season grasses; conservative use levels will lead to 55-65% of biomass being retained on site after grazing to improve litter cover, soil protection, and water infiltration. Improvement in vegetative cover and plant vigor expected given adequate precipitation. Areas of thick tree or brush cover will remain static.	Dormant season grazing on Old Camp Allotment may benefit warm-season perennial grass establishment in areas departing from desired conditions.	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.
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 conservative use levels allows for 55-65% of biomass to be retained on site. Retention of biomass would allow organic matter to be incorporated into the soil for nutrient cycling and protection from accelerated soil loss.	Dormant season grazing on Old Camp Allotment may benefit perennial grass establishment and improve vegetative groundcover, but grazing during the wetter winter months could lead to more soil compaction by hoof action, thereby reducing infiltration of water into the soil. Dormant season grazing may result in less herbivory on scattered riparian vegetation in Horse Wash and Williamson Valley Wash.	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 because of more biomass retained on site.

	<p>Alternatives 1 Proposed Action</p>	<p>Alternative 2, Seasonal Grazing Old Camp Allotment</p>	<p>Alternative 3 No Action/ No Grazing</p>
<p>Wildlife/Rare Plant/Aquatic Species Effects</p>	<p>Since the allotment does not contain known populations of Threatened or Endangered species, and potential habitat is lacking, there will be no effects to Federally listed species or their designated Critical Habitats. Upland areas will improve towards 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</p>	<p>Same as alternative 1, except for the Old Camp Allotment, dormant season grazing would reduce competition for forage during summer months between livestock and wildlife.</p>	<p>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 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.</p>

	Alternatives 1 Proposed Action	Alternative 2, Seasonal Grazing Old Camp Allotment	Alternative 3 No Action/ No Grazing
	wildlife habitat quality.		
Archeological Effects	No adverse effects on heritage resources. Avoidance of impacts to cultural resources during construction of new range improvements.	Same as alternative 1.	No effects on heritage resources.
Recreational Effects	No adverse effects on recreational opportunities	Same as alternative 1.	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.	Same as alternative 1.	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 specialist's reports, included in the project record, contain details of these considerations.

The following table summarizes the past, present, and future activities within the Chino Small 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. There are eleven 6th code subwatersheds that contain the project area: Cottonwood Canyon, Hitt Wash, Horse Wash, Loco Creek, Lower Walnut Creek, Lower Williamson Valley Wash, Mud Tank Wash, Pine Creek, Scotts Basin,

Strickland Wash, and Upper Williamson Valley Wash. The maps 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	Yolo South Allotment has areas still showing effects of a wildfire that occurred over 10 years ago.	unknown
Veg Treatment Projects / Non-Structural Range Improvements / Rx Burns	During the past 10 years there has been no mechanical tree or brush thinning activities, but there has been about 6,393 acres of prescribed burning in the watersheds.	No prescribed burning has occurred since 2011. This burn was in the subwatershed containing Yolo South.	unknown
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 forage supplies.
Recreational Activities & Fuelwood Cutting	Motorized and non-motorized trails; dispersed recreation (primarily OHV use, target shooting, hunting)	Same activities as past; about 76 miles of existing designated trails within the subwatersheds	No anticipated change; no new trails planned
Mining	Historic mining activities that may or may not have been regulated	There are currently 9 mining claims in the 6 th code watersheds containing the allotments that are either pending or existing.	unknown
Roads, Utility ROWs, Land Development and Land Exchanges	245 miles of roads on National Forest land within the 6 th level HUCs containing the project area; utility corridors	245 miles of roads on National Forest land in watersheds; utility corridors remain	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 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 33% similarity to the average cover of indicator plant species that are present in the ecological type (ET) plant community for the representative soil map unit.. 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 average cover for the ecological type potential plant community 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. The desired condition is also range administration that provides for the maintenance of satisfactory Rangeland Management Status (RMS) with a static or upward trend. In addition, the draft 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. 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.

Hitt Wash Allotment

There were 2 TEUI map units chosen as key areas to evaluate vegetation ecological status in three pastures. For the North Pasture, TEUI 481 was inventoried, South Pasture TEUI 434; B.Y. Pasture TEUI 481. These map units were selected based on their accessibility to livestock, in other words, they are found on flat to gently sloping areas.

Table 3: Potential Natural Vegetation Type (PNVT) – Hitt Wash Allotment

PNVT	TEUI included Within	Acreage	Percent of Allotment
Pinyon Juniper Evergreen Shrub	434, 477, 481	5597	98%
Riparian Gallery Forest	48	120	2%

TEUI 481, North Pasture

The key map unit in the North Pasture, TEUI 481, is pinyon/juniper woodlands and grasslands on elevated and valley plains. It is mostly on gentler slopes (0-15%) across the southern and central portions of the pasture. The vegetation for this map unit fits within the Pinyon Juniper-Evergreen Shrub PNVT. These woodlands have had prior thinning treatments to remove juniper and promote grass growth, but these occurred decades ago. The average perennial grass cover for the ecological type (ET) in areas that were thinned in the past should be about 20%, with the dominant species being blue grama, Muhlenbergia species, and threeawns. The data to describe existing vegetation was collected September 2013. The growing season in 2013 had about average precipitation and grasses were in fair vigor at the time of sampling. Sampling occurred prior to winter seasonal grazing. Existing perennial grass cover was 98% which is much higher than the average cover as described for the ET. The main species encountered were threeawn, sideoats grama, blue grama, sand dropseed, and ring muhly. The existing species mix and canopy cover of perennial grasses exhibits mid-similarity to the perennial grass composition and average cover of the ET, and the trend is stable, so this site is meeting desired conditions for vegetation.

TEUI 481, Barney York Pasture

The data to describe existing vegetation was collected September 2013. The growing season in 2013 had about average precipitation and grasses were in fair vigor at the time of sampling. Sampling occurred prior to winter seasonal grazing. Total perennial grass cover was 56% which is more than double the mean total graminoid cover for the ecological type (ET). The ET plant community has on average 4 different grass species present, while at this site there were 7 perennial grass species recorded. The species mix was similar to that recorded at the North Pasture location. Total shrub cover on site is 41% which is more than double the average cover of the ET, and existing tree cover on site was 5% while the average cover of the ET is 3%. This site exhibits mid-similarity for species composition and cover of perennial grasses, and the trend is stable, so it is meeting desired conditions.

TEUI 434, South Pasture

The key map unit in the South Pasture, TEUI 434, is pinyon/juniper woodlands on hills and elevated plains. Slopes are moderate averaging 10%, ranging from 0- 40%. The vegetation for this map unit fits within the Pinyon Juniper-Evergreen Shrub PNVT. Tree cover averages 29% mostly comprised of Juniper. Shrub cover ranges from 3-25% within the various community types found on this soil map unit, primarily consisting of turbinella oak with some skunkbush. Perennial grass cover will vary depending on shrub and tree cover, with the ecological type (ET) having an average of 17% cover from indicator species: sideoats grama, blue grama, and squirreltail. The data to describe existing vegetation was collected September 2013. The growing season in 2013 had about average precipitation and grasses were in fair vigor at the time of sampling. Sampling occurred prior to winter seasonal grazing. This sampling site is located on a southwest aspect, which contrasts with other aspects as having less tree and

shrub cover and more grass and forb cover. Total perennial grass cover was 54% which is three times the average cover for the ET. Seven grass species were recorded within the sample area while 6 species are indicative of the expected species diversity for grasses. The existing grass species included sideoats grama, blue grama, squirreltail, sand dropseed, and threeawns. Shrub cover was higher than the ET with 38% existing cover compared to 21% for the ET. The site exhibits high similarity for species composition and cover of perennial grasses and has a stable trend, so it is meeting desired conditions.

Table 4: Desired Vegetation Status and Rangeland Management Status by Pasture on Hitt Wash Allotment

Pasture	TEUI Map Unit	Desired Vegetation Status	Trend	Rangeland Management Status
North	481	Meeting: Mid similarity for grasses	C2 Stable	Satisfactory
South	434	Meeting DVS: Mid similarity for grasses	C4 Stable	Satisfactory
Barney York	481	Meeting DVS: Mid similarity for grasses	C1 Stable	Satisfactory

Old Camp Allotment

There were 3 TEUI map units chosen as key areas to evaluate vegetation ecological status in four pastures. For the North Pasture, TEUI 481 was inventoried, East Pasture TEUI 434; West Pasture TEUI 481, and South Pasture TEUI 461. These map units were selected based on their accessibility to livestock, in other words, they are found on flat to gently sloping areas.

Table 5: Potential Natural Vegetation Type (PNVT) Acreage on the Old Camp Allotment

PNVT	TEUI included Within	Acreage	Percent of Allotment
Pinyon Juniper Evergreen Shrub	43, 430, 434, 461, 462, 477, 479, 481, 486	5724	90%
Riparian Gallery Forest	48	323	5%
Great Basin Grassland	45, 433	212	3%
Interior Chaparral	436	34	1%
Juniper Grassland	439	41	1%

TEUI 481, North Pasture

The key map unit in the North pasture, TEUI 481, is pinyon/juniper woodlands and grasslands on elevated and valley plains. It is mostly on gentler slopes (0-15%) across the northern and southwest corner of the pasture. The data to describe existing vegetation was collected September 2013. The growing season in 2013 had about average precipitation and grasses were in fair vigor at the time of sampling. Total perennial grass cover was 19% which is nearly equal to the average perennial grass cover of 20% for the ecological type (ET). Tree cover is 12% and shrub cover is 17% compared to the average for the ET of 3% and 18% respectively. The sampled grass species are threeawn, sideoats grama, blue grama, Muhlenbergia, and sand

dropseed. The site exhibits high similarity for species composition and cover of perennial grasses and has a stable trend, so it is meeting desired conditions.

TEUI 481, West Pasture

The data to describe existing vegetation was collected September 2013. The growing season in 2013 had about average precipitation and grasses were in fair vigor at the time of sampling. Grass cover was 30% which is above the average cover for the ET for perennial grasses of 20%. Tree and shrub cover are below the ecological type average that consists of juniper woodlands treated in the past to remove juniper overstory. Juniper thinning has not occurred in

recent decades however. The existing grass species are threeawn, sideoats grama, blue grama, Muhlenbergia, and sand dropseed. This site exhibits high similarity to the ET for species composition and cover of perennial grasses and has an upward trend, so it is meeting desired conditions.



Photo: TEUI 481 inventory location in the West Pasture. Placard in photo lists incorrect pasture name.

TEUI 434, East Pasture

The key map unit in the East Pasture, TEUI 434, is pinyon/juniper woodlands on hills and elevated plains. Slopes are moderate averaging 10%, ranging from 0- 40%. The vegetation for this map unit fits within the PJ-Chaparral PNVT. The shrub cover is variable among the community types ranging from 3-25% primarily consisting of turbinella oak with some skunkbush. Perennial grass cover will vary depending on shrub and tree cover, with the average for the ecological type (ET) having 17% cover from indicator species: Sideoats grama, blue grama, and squirreltail. The data to describe existing vegetation was collected September 2013. Total perennial grass cover was 4%.. Total existing shrub cover was slightly below the average for the ET with turbinella oak making up 13% of total cover. This site was selected after a thorough review of this TEUI in East Pasture. Although the total grass cover is below the average for the ET, the key indicator grasses are present in adequate levels to give this site mid-similarity. Long-term monitoring in this key area indicates a stable trend, so it is meeting desired conditions for vegetation.



Photo: TEUI 434 inventory location in the East Pasture of the Old Camp Allotment. Placard in photo lists incorrect pasture name. The potential plant community at this location is a woodland type with 30% tree cover and 21% shrub cover. Grasses are the least prominent vegetation form in this soil map unit.

TEUI 461, South Pasture

The key map unit in the South Pasture, TEUI 461, is pinyon/juniper woodlands on hills and elevated plains. Slopes are moderate averaging 4%, ranging from 0- 15%. The vegetation for this map unit fits within the PJ-Chaparral PNVT. Shrub cover is variable among the community types for this soil map unit, ranging from 9-20% cover primarily consisting of turbinella oak with some skunkbush and broom snakeweed. Perennial grass cover will vary depending on shrub and tree cover, with the average for the ecological type (ET) having 16% total cover with the indicator species being sideoats grama, blue grama, hairy grama, and squirreltail. The data to describe existing vegetation was collected September 2013. Total perennial grass cover is 12% which is slightly below the ET average of 16%. The composition and cover from indicator perennial grass species shows mid-similarity to the ET and the trend is stable, so this site is meeting desired vegetation condition.

Table 6: Desired Vegetation Status and Rangeland Management Status by Pasture for Old Camp Allotment

Pasture	TEUI Map Unit	Desired Vegetation Status	Trend	Rangeland Management Status
North	481	Meeting DVS: High similarity for grasses	C1, C2, & C3 stable	Satisfactory
West	481	Meeting DVS: High similarity for grasses	C1, C2, & C3 upward	Satisfactory
East	434	Meeting DVS: Mid similarity for grasses	C4 stable	Satisfactory
South	461	Meeting DVS: Mid similarity for grasses	Rangeland Health inventories stable	Satisfactory

Quartz Wash Allotment

There were 2 TEUI map units chosen as key areas to evaluate vegetation ecological status in three pastures. For the Quartz Pasture, TEUI 417 was inventoried, and for Fritsche and Center

pastures TEUI 412. These map units were selected based on their accessibility to livestock, in other words, they are found on flat to gently sloping areas. There are five vegetation types found on the allotment. The TEUI units that make up these vegetation types are shown in the table below.

Table 7: Potential Natural Vegetation Type

PNVT	TEUI included Within	Acreage	Percent of Allotment
Great Basin Grassland	408, 412, 417	1,220	17
Juniper Grassland	413, 423, 463	537	8
Pinyon-Juniper Woodland	419, 420, 421, 422, 426	2,831	40
Pinyon-Juniper Evergreen Shrub	430,434, 440, 441, 477, 479, 481	2,406	34
Riparian Gallery Forest	48	120	1

TEUI 417, Quartz Pasture

The key map unit in the Quartz pasture, TEUI 417, is grasslands on lowland and elevated plains. It is mostly found on level or gentle slopes averaging 3% in the northwest corner of this pasture. The vegetation for this map unit fits within the Great Basin Grassland PNVT. The site potential is varied depending on disturbance. Reduction of woody species by pushing or chaining has disturbed the natural vegetation and soils on some areas. This map unit is dominated by blue grama. Tree cover averages 5% primarily from juniper, and shrubs 4% consisting of shrubby buckwheat, broom snakeweed, and cliffrose. The average perennial grass cover of the ET is 55% dominated by blue and sideoats grama. The data to describe existing vegetation was collected March 2014. The growing season in 2013 had nearly average precipitation and grasses were in fair vigor at the time of sampling. When this site was read it had being grazed for only a short period, and then livestock were removed from the pasture due to lack of water. The site selected is a historic sampling site for TEUI 417. Estimated utilization at this location was <5%. Total perennial grass cover at the sampled site was 55%, equal to the ET. The species composition and existing cover of grasses exhibits high similarity to the ET for TEUI 417 and the trend is up, so vegetation is meeting desired conditions.

TEUI 412, Center Pasture

The key map unit in the Center pasture, TEUI 412, is grasslands on lowland and elevated plains. It is mostly found on gentle slopes (0-15%) across the center of this pasture with a band going toward the northeast corner. The vegetation for this map unit fits within the Great Basin Grassland PNVT. Reduction of woody species by pushing or chaining has disturbed the natural vegetation and soils on some areas. Tree cover for the ecological type (ET) averages 6% from primarily juniper and shrub cover averages 6% consisting of broom snakeweed, algerita and cliffrose. Total perennial grass cover for the ET averages 49% dominated by blue grama, sideoats grama, and New Mexico feathergrass. The data to describe existing vegetation was collected March 2014. The growing season in 2013 had about average precipitation and grasses were in fair vigor at the time of sampling. When this site was read it was being grazed, and had exceeded allowable grazing use (45%) at key areas of this pasture. This location was

determined through Interdisciplinary Team discussion on site as representative of average vegetation quality. Estimated utilization at this location was 60%. Even though grass canopy cover had been removed by grazing, there was still 37% canopy cover of perennial grasses remaining at this site. The similarity to the ET rated on the cusp of low and mid similarity. Allowing that some cover was removed by grazing at the time of sampling, the site would exhibit mid similarity to potential when the grass canopy is intact. A review of long-term monitoring data in this key area shows that trend is down, so vegetation is not meeting desired condition .

TEUI 412, Fritsche Pasture

The key map unit in the Fritsche pasture, TEUI 412, is grasslands on lowland and elevated plains. It is mostly found on gentle slopes (0-15%) across the center of this pasture with a band going toward the northeast corner. The data to describe existing vegetation was collected November 2014. The growing season in 2014 had about average precipitation and grasses were in fair vigor at the time of sampling. When this site was read it was being grazed, and had exceeded allowable grazing use (45%) at the key area of this pasture. This location was determined through Interdisciplinary Team discussion on site as representative of average vegetation quality. Estimated utilization at this location was 60-70%. Total grass cover at this site was 25%, about half of what is expected for the ET of 49%. New Mexico feather grass was not found on site but black grama was recorded at 6% cover. Considering the amount of forage removed by grazing this site is actually higher in similarity to the ET than the data indicates. Species composition and cover percentage when compared to the ET results in mid similarity for grasses, although the long term trend is down. The site is not meeting desired conditions since the trend is down; once the trend becomes stable or upward, it will be meeting the desired condition for vegetation.

A summary of the vegetation status is shown in the table below. Although the species composition and cover of grasses is meeting the desired conditions, the trend as shown from repeat sampling at the same location is down in the Center and Fritsche Pastures. The downward trend is what is prompting the determination of unsatisfactory Rangeland Management Status. In response to this finding, grazing was suspended in both the Center and Fritsche Pastures for the 2014/2015 grazing season.

Table 8: Desired Vegetation Status and Rangeland Management Status by Pasture for Quartz Wash Allotment

Pasture	TEUI Map Unit	Desired Vegetation Status	Trend	Rangeland Management Status
Quartz	417	Meeting DVS: High similarity for grasses	C1 in TEUI 417; up	Satisfactory
Center	412	Meeting DVS: Mid similarity for grasses	C3 in TEUI 417; down	Unsatisfactory
Fritsche	412	Meeting DVS: Mid similarity for grasses	C2 in TEUI 417; down	Unsatisfactory

Yolo South Allotment

There were 2 TEUI map units chosen as key areas to evaluate vegetation ecological status. For South Mesa, TEUI 461 was inventoried and in Orejano Basin it was TEUI 475. The South Mesa

location is found at the north end of the allotment, north of Moonshine Canyon. This canyon provides a natural barrier for livestock, so grazing does not occur north of the canyon unless cattle drift from adjacent allotments or are hauled there from the north. There is no water source on South Mesa. Orejano Basin is in the middle portion of the allotment and is grazed seasonally by livestock. Cattle water at natural springs and at a few access points in Moonshine Canyon. The TEUI units that make up the vegetation types found on the allotment are shown in the table below.

Table 9: Potential Natural Vegetation Type (PNVT) Acreage on the Yolo South Allotment

PNVT	TEUI included Within	Acreage	Percent of Allotment
Piñon Juniper Evergreen Shrub	430, 461	1391	40
Riparian Gallery Forest	41	84	2
Interior Chaparral	436, 475	1758	51
Juniper Grassland	427, 428	222	6

TEUI 461, South Mesa

The key map unit on South Mesa, TEUI 461, is a Piñon Juniper Woodland on elevated plains. It is mostly on gentle slopes and all aspects. The vegetation for this map unit fits into Piñon Juniper-Evergreen Shrub PNVT. Tree cover for the ecological type (ET) averages 36% and is from juniper and Piñon pine. Shrub cover averages 20% with turbinella oak being the dominant species. Perennial grass cover will vary depending on shrub and tree cover, with the ET averaging 16% cover with sideoats grama and squirreltail being the dominant indicator species. The data to describe existing vegetation was collected September 2013. The growing season in 2013 had average precipitation and grasses were in good vigor at the time of sampling. Total perennial grass cover was 15% which is nearly equal to the ET average of 16%. Tree cover is 22% and shrub cover is 16% compared to the average for the ET of 36% and 20%, respectively. The site selected is a representative for TEUI 461 and a historical monitoring site. This site had the juniper removed using dozers and cables in the late 1950's. Although total grass cover is similar to the site potential, there is overall low similarity to the species composition of indicator grass species for TEUI 461. This existing grass cover was dominated by blue grama, and both indicator species squirreltail and hairy grama were absent. The existing perennial grass component is not meeting the desired vegetation status at this location, although both the tree and shrub components exhibit high similarity to the ET site potential. The long-term trend at this location is stable.

TEUI 475, Orejano Basin

The key map unit on Orejano Basin, TEUI 475, is Interior Chaparral found on hills and mountains. Shrub cover for the ET averages 60% with turbinella oak and mountain mahogany being the dominant species. Perennial grass cover will vary depending on shrub cover, with the ET grass cover averaging 10% with sideoats grama, blue grama, and threeawn being the indicator species. The data to describe existing vegetation was collected September 2013. The growing season in 2013 had average precipitation and grasses were in good vigor at the time of sampling. Total perennial grass cover was 5% which is half of the ET cover of 10%. Shrub cover is 32% compared to 60% for the ET. The composition and cover from indicator perennial grass species shows mid-similarity to the site potential and the long-term trend is stable, so it is



meeting desired condition. The shrub component also shows mid similarity to the ET plant community.

Photo: TEUI 475 inventory location in Orejano Basin, Yolo South Allotment

Table 10: Desired Vegetation Status and Rangeland Management Status by Pasture for Yolo South Allotment

Pasture	TEUI Map Unit	Desired Vegetation Status	Trend	Rangeland Management Status
South Mesa	461	Not Meeting DVS: Low similarity for grasses	C3 stable	Unsatisfactory
Orejano Basin	475	Meeting DVS: Mid similarity for grasses	C1 stable	Satisfactory

Invasive Plant Species

Noxious weed surveys have not been conducted specifically on these allotments. Isolated populations of saltcedar are 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

Common to All Allotments:

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 conservative 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 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).

Hitt Wash

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. With continued grazing management that includes warm growing season rest, 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 proposed fence changes and additions will aid in proper livestock distribution so that under-utilized areas will take away some of the grazing pressure from traditional congregation areas.

The actual use records for the allotment from 2004 through 2014 show a range of stocking levels from 91 Animal-Months (AMs) in 2005/06, and up to 464 AMs in 2009/10. This upper number is equivalent to 84 adult cattle for 5.5 months. While stocked on a dormant season basis, under light utilization according to 2210 inspection reports at key areas, vegetation has improved. Key areas have been established and inspections recorded light to moderate utilization levels over multiple years at the end of the grazing season.

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 115 head for 5.5 months (634 AUM) when 45% of the available forage estimate is allocated to livestock and adjustments are made for distance to water. Yearly fluctuations in forage production based on precipitation levels will be taken into account by adjusting yearly stocking through adaptive management.

Old Camp

Effects Common to Alternatives 1 and 2:

At the TEUI inventory sites on the allotment the existing canopy cover and species composition is found to be meeting desired condition for vegetation. With continued grazing management that includes deferred growing season rest, 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 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, especially in the West and East Pastures containing Horse Wash.

The actual use records for the allotment from 1996 through 2014 show a range of stocking levels from 122 Animal-Months (AMs) in 1998 during a drought period up to 485 AMs in 2011. This range is equivalent to 10-40 adult cattle year long. From 1996-2009 authorized use was not to exceed 330 HM for variable season, when Jordan Pasture allotment was added in 2010 that changed to not exceed 540 HM or 45 head adult cow/calf and bulls. The average stocking level for 1996 to 2009 time period is 258 AMs, or 22 cattle year long. From 2010 to 2014 the average stocking level was 399 HM or 33 head year long. While stocked at these levels, rangeland health condition has only gone down during drought according to 2210 inspection reports at key areas. Inspections recorded utilization levels being exceeded in 1996, 1997, and 2002. These years coincide with years following significant droughts, and were in the driest period of the year (May–June).

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 ranged from 47 Animal Units yearlong (564 AUM) when 45% of the available forage estimate is allocated to livestock, to 44 Animal Units yearlong (~ 528 AUM) when a reduction in capacity is taken into account for travel greater than 1 mile to water for forage. The stocking rates are identical for alternatives 1 and 2 though the seasonality varies from yearlong to winter-seasonal, respectively. Yearly fluctuations in forage production based on precipitation levels will be taken into account by adjusting yearly stocking through adaptive management.

Alternative 1, Yearlong Grazing:

Yearlong grazing in a deferred rotation pasture system with Alternative 1 will allow for growing season rest or deferment in each pasture. This will allow for improved vigor for warm-season grasses such as blue grama, sideoats grama, ring muhly, and black grama grasses that are found on the allotment. True cool-season grasses such as threeawns and squirreltail will also receive rest or deferment when a pasture is not used during the spring. Compliance with allowable use levels should provide for maintaining and improving the cool-season grass species that are present.

Alternative 2, Dormant Season Grazing:

The dormant season grazing proposed with Alternative 2 will allow for growing season rest every year for warm-season grasses such as blue grama, sideoats grama, ring muhly, and mat muhly grasses that are found on the allotment. Another common species, sideoats grama, is known to green up early in the spring and could be preferentially grazed in March before cattle are removed by April 30th. True cool-season grasses such as squirreltail may also be preferentially selected in early spring. Compliance with allowable use levels should provide for maintaining and improving the cool-season grass species that are present.

Grazing during plant dormancy is easier to measure and less traumatic on the plant. In our region there are periods of warmer weather with adequate moisture that grasses will green up and be targeted, but less so in dormant season grazing than while plants are actively growing in the summer. Reduced repeated grazing on growing plants has been shown to improve plant vigor and increase organic ground cover. Stronger root systems on perennial grasses improve successful survival during droughts.

Quartz Wash

At the TEUI inventory sites on the allotment the existing canopy cover and species composition is found to be meeting desired condition for vegetation, but rangeland management status is unsatisfactory in the Center and Fritsche Pastures because long-term trend is down. The light use levels proposed in TEUI 412 should help to improve forage plant vigor so that improvement in trend will occur. 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, especially in Center Pasture containing Walnut Creek.

Seasonal grazing in a deferred rotation pasture system with Alternative 1 will allow for growing season rest in each pasture. This will allow for improved vigor for warm-season grasses such as blue grama, sideoats grama, ring muhly, and black grama grasses that are found on the allotment. True cool-season grasses such as New Mexico feathergrass, threeawns and squirreltail will also receive rest or deferment when a pasture is not used during the spring. Compliance with allowable use levels should provide for maintaining and improving the cool-season grass species that are present.

The actual use records for the allotment from 1998 through 2013 show a range of stocking levels from 0 Animal-Months (AMs) in 2002/03, and up to 557 AMs in 2003/04. This upper number is equivalent to 57 adult cattle for 7 months. While stocked yearlong rangeland health condition trended down during drought according to range inspection reports at key areas. Inspections recorded utilization levels being exceeded during drought in 1996 and cattle were removed. 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. Between 1998 and present there is only one inspection in 2007 in the records that discuss high utilization levels and livestock concentration.

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 calculated at 121 head for 7 months (845 AUM) when 45% of the available forage estimate is allocated to livestock and distance to water is calculated. 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.

Yolo South

Of the two TEUI inventory sites on the allotment; the existing canopy cover and species composition is found to be meeting desired condition for vegetation at Orejano Basin, while the other at South Mesa is not, although it is not being grazed. With continued grazing management that includes adherence to allowable use levels, the desired conditions for vegetation should be sustainable in Orejano Basin. The South Mesa site is likely to remain stable unless juniper

thinning is performed that would allow for more herbaceous plants to establish. Variable season grazing with Alternative 1 will allow for maximum flexibility for using the allotment when it is ready to be used and not because it is in the rotation. Variable season on this allotment (with no permanent water sources) allows flexibility to be used when both forage and water are available. Dormant use will provide rest for warm season grasses. Adequate precipitation is essential to achieving optimal plant vigor and production. If South Mesa is treated to reduce the juniper cover, the proposed new water source will open this area to grazing. Fencing and developing Laurel spring will reduce the impact on the riparian vegetation zone, and extend the period of use for this area reducing pressure on the northern part of Orejano Basin.

The actual use records for the allotment from 1999 through 2014 show a range of stocking levels from 0 Animal-Months (AMs) in the early 2000s following a severe drought period up to 660 AMs in 2012. This range is equivalent to 0-165 adult cattle for a 4-month period. The average stocking level for this time period is 247 AMs or 62 cattle for 4 months. This is comparable to the stocking level proposed in alternative 1.

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 ranged from 66 Animal Units for four months (263 AUM) when 45% of the available forage estimate is allocated to livestock to 46 Animal Units (~ 185 AUM) when distance to water is taken into account. South Mesa has no access to water. 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 3 – 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 or 2 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

Alternatives 1 and 2:

Structural Range Improvements: Both alternatives 1 and 2 would allow for the construction of new water developments and new fencing in the project area, as well as gully treatments. 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. Gully treatments consist of cutting adjacent juniper trees and piling in the gully or using rocks to create small structures to trap and retain sediment. Using adjacent juniper to create sediment structures in gullies will help stabilize the soil loss and gully downcutting. The removal of trees near the gully may also release perennial grasses that are being shaded out. Perennial grass cover along these gullies will help reduce sheet flow into the gully. Impact will be minimal as mechanical cutting is not approved. 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. 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 3: 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 Chino Small Allotments project area. The past and present activities and events that have affected the vegetation include livestock and wildlife grazing, past wildfires, prescribed fire, range improvement construction, 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 these past activities are no longer evident except for on Yolo South Allotment where past wildfire activity is still manifested in reduced shrub cover from site potential. Shrub cover will increase to site potential levels over time. The vegetation impacts created through livestock grazing, improvement construction, and adaptive management as described for alternatives 1 and 2, 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 \$50,000-\$60,000 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 alternatives 1 and 2, 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 alternatives 1 and 2, several new range improvements that are the most critical to improving management are planned for construction within two years of issuing the new term grazing permit. The new range improvements expected to be constructed within two years include: Hitt Wash – water development to replace Sampson Tank, North/South Pasture fence realignment (approximately 0.5 miles), and water development in B.Y. Pasture; Old Camp – Two water developments (South Pasture, section 30 and North Pasture, section 6); Quartz Wash – water development in Quartz Pasture; Yolo South – Laurel Spring development. The cost of these high priority range improvements are estimated to be about \$20,000 each for the new water developments, fence construction costs about \$12,000 per mile, and the spring development would cost about \$2,500. These estimated costs include both the material costs that are typically borne by the Forest Service, and the labor cost to construct that is typically provided by the grazing permittee. 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?

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 draft 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, vegetation, and water resource field data was collected by the Prescott National Forest Rangeland Core Team which consists of the Rangeland Management Specialist, Hydrologist, and Soil Scientist. This field data was summarized and used to determine existing conditions. 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 1999). The soil condition rating procedure evaluates soil quality based on an interpretation of factors that affect three primary soil functions. The primary soil functions evaluated are soil stability, soil hydrology, and nutrient cycling (USDA FS 1999). These functions are interrelated. Field 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 Soil and Watershed Cumulative Effects: located in the Hydrology and Water Resources Specialist Report. 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 and photographs display existing soil condition for each representative map unit that was analyzed by allotment.

Hitt Wash Allotment

TEUI 481 – North Pasture and B.Y. Pasture

TEUI 481 are pinyon/juniper woodlands and grasslands on elevated and valley plains. Slopes are gentle to moderate, ranging from 0-15%. Vegetation in this map unit is highly variable due to differences in topo-position on the landscape and the occurrence of past juniper thinning treatments. Soils are located on gently sloping gradients, have a moderately-coarse to coarse texture, are deep, have minimal rock content within the soil profile, and are classified as Typic Haplustalfs. Parent material is alluvium from Tertiary and Quaternary sediments. Soil erosion hazard is slight due to the flatter slopes. However, their less cohesive parent material, due to granitic material within the sediments, results in an erosive property that requires soil organic matter and vegetation cover to maintain stability. These soils have a potential to be highly productive due to their higher available water holding capacity and non-limiting soil texture and pH levels.



TEUI 481 – North Pasture, Hit Wash:

Soil conditions are satisfactory. Graminoid cover and vegetative ground cover are similar to potential and promoting soil function. There is minimal sheet erosion due to the amount of vegetative cover.



TEUI 481 - B.Y. Pasture, Hitt Wash:

The soil condition was field-verified as impaired in the B.Y. Pasture as a whole, although some satisfactory conditions are present on hillslopes and the toe of slopes. The photo at left shows a valley bottom location where there is evidence of severe compaction, decreased infiltration,

and poor vegetation distribution. The photo shows a gully that has begun to re-vegetate, although areas of active soil movement and head-cutting still exist. From a forest-wide standpoint, this soil map unit is rated as unsatisfactory. Even though there are areas needing improvement in soil condition in the B.Y. Pasture, the existing vegetative groundcover is at or

near the site potential and the site-specific soil condition of Impaired is better than the average condition for TEUI 481 forest-wide.

TEUI 434 – South Pasture, Hitt Wash

TEUI 434 is a representative unit of the prominent alluvium parent material from granite origins within the South Pasture. The PNVT is classified as Pinyon-Juniper Evergreen Shrub and the map unit is located on moderately steep slopes. Soils are classified as Typic Paleustalfs, are deep, and surface texture is coarse while subsurface soils are clayey. Soil strength is high due to coarse textures and internal rock, making the soils less susceptible to compaction. However, the subsurface clayey textures are susceptible to damage when wet from load bearing stresses. Soils are erosive due to the low cohesion associated with the alluvial sediments and have a moderate erosion hazard. Maintenance of vegetation ground cover is necessary to maintain soil stability and productivity. The high level of sand in the soil surface texture limits the soils ability to retain moisture for graminoid growth. However, the coarse texture and deep soils allow the ability of precipitation to percolate deeply within the soil profile for shrub and tree production.



TEUI 434 - South Pasture, Hitt Wash:

The soil condition was field-verified as satisfactory condition although this soil map unit is rated as impaired forest-wide. This map unit shows variable shrub and grass cover. On this south-facing slope there is considerable cover from perennial grasses such as sideoats grama, but

the hillside in the background shows higher shrub cover on a north-facing slope. Water flow patterns are broken up by the presence of perennial vegetation, and there is minimal evidence of litter movement.

Old Camp Allotment



TEUI 481 – West and North Pastures

TEUI 481 are pinyon/juniper woodlands and grasslands on elevated and valley plains. See the full description for TEUI 481 under the Hitt Wash Allotment. This photo shows an area exhibiting perennial grass cover

at or above site potential in the West Pasture.

TEUI 481 – West Pasture, Old Camp:

Overland water flow is disrupted by the spatial arrangement of grass plants. Adequate spatial distribution of herbaceous plants promotes water infiltration and mitigates sheet erosion. This site was field-verified as having satisfactory soil condition as compared to the forest-wide condition of TEUI 481 that is unsatisfactory.



TEUI 481 – North Pasture, Old Camp:

This photo shows the higher prevalence of bare spaces in some areas of TEUI 481 in the North Pasture. Spaces between grass plants are larger and have coalesced to form bare patches where surface water can flow unimpeded and lead to sheet

erosion. Infiltration of precipitation into the soil will be less effective without adequate vegetation and plant litter. TEUI 481 in this pasture is rated as impaired with some areas of satisfactory condition. A decrease of organic matter within basal vegetation and formation of physical crust along with pedestalling indicates elevated soil loss, decreased infiltration, and a decrease in nutrient cycling. Other areas of the pasture have a very dense network of grasses resulting in satisfactory condition. Compaction is present. Some gullies are present but they show signs of stabilizing.



TEUI 434, East Pasture, Old Camp:

This soil map unit is described under the Hitt Wash Allotment section. The soil condition for this map unit was field-verified in unsatisfactory condition.

Photo #1 shows an area in the soil map unit that has some graminoid and shrub cover, but there is still a large amount of bare

ground, with bare spaces between plants allowing for concentrated overland flow of water when it rains. Some areas in this map unit have dense juniper cover as shown in the following photo where there is an absence of any perennial grasses.



Photo #2 shows an area of widespread accelerated erosion in the form of active gullying, rilling, and sheet erosion. The loss of topsoil that has already occurred on sites like this make it difficult to achieve improvement in the next decade. Treatments to reduce juniper density and provide immediate stabilizing ground cover through scattering slash

or adding mulch and seed would likely be needed to improve this site within a decade. No juniper thinning treatments are being included in this project.

TEUI 461 – South Pasture, Old Camp

TEUI 461 is the key map unit within the South Pasture, making up 21% of the pasture as a whole. This PNVT is classified as Pinyon-Juniper Evergreen Shrub. A large potential vegetation component of this TEUI is Juniper and Pinyon trees. Slope gradient associated with this TEUI is gently-sloping.

Two components make up this soil type. The representative component soils are moderately deep and moderately fine-textured with a high shrink-swell potential, and the soils are classified as Typic Argiustolls. The high levels of clay and shrink-swell characteristics can limit graminoid production and be more conducive for juniper production. Soils have a low soil strength and susceptible to compaction from hoof action and damage when wet. Another component of this map unit is associated with extremely stony rock cover, and has more of a graminoid component, with a shallow depth with a large volume of rocks within the soil profile. Soils with a considerable rock component are not susceptible to mechanical damage and compaction.



TEUI 461, South Pasture, Old Camp: Photo #1 is an area showing a fair amount of perennial grass cover within an opening amongst the juniper and pinyon canopy. This soil map unit is extremely variable in the amount

of herbaceous cover present.



Photo #2 shows another area within the same soil map unit that is devoid of any herbaceous plant cover and the soil surface is covered with cobble-sized rocks. Areas that have already lost most herbaceous plant cover are unlikely to have substantial establishment of perennial herbaceous plants within the next

decade since very limited seed source is present, and soil surface erosion may have caused a loss of suitable characteristics for plant establishment. The soil map unit was field-verified in unsatisfactory condition in the South Pasture.

Quartz Wash Allotment

TEUI 412 – Center and Fritsche Pastures, Quartz Wash

TEUI 412 are grasslands on lowland and elevated plains in the northeast corner of the western side of the Prescott National Forest in the vicinity of Yavapai Ranch. These soils are found on nearly level to gentle slopes ranging from 0-11%, averaging 4%. Soils are high in calcium carbonates, moderately deep, gravelly, fine sandy loam. The soil is classified as a Petrocalcic Paleustalf. Soil developed in limestone and basalt alluvium. This map unit has typically been chained or pushed in the past to reduce woody species cover. All community types show signs of disturbance from the past chaining and pushing, and from grazing.



TEUI 412, Center Pasture, Quartz Wash: There is evidence of significant soil compaction, poor vegetation distribution, and poor nutrient cycling in some areas of this soil map unit. The field-verified soil condition rating is unsatisfactory. The potential cover from perennial grasses is 49% while the amount of existing cover

measured in the field was only 10%. Increasing the amount of herbaceous cover will prevent sheet erosion, and allow more accumulation of organic matter in the soil, thereby improving water infiltration and nutrient cycling.



TEUI 412, Fritsche Pasture, Quartz Wash: The photo to the left shows areas of bare ground that have coalesced to form distinct runoff patterns leading to accelerated sheet erosion. There is significant compaction on exposed soil. There is poor vegetation distribution, and poor nutrient cycling. The perennial grass cover for this soil map unit should be about 49%,

while the existing perennial grass cover is only 16% as measured in the field. The field-verified soil condition is unsatisfactory. Increasing the amount of herbaceous cover will prevent sheet erosion, and allow more accumulation of organic matter in the soil, thereby improving water infiltration and nutrient cycling.

TEUI 417 – Quartz Pasture, Quartz Wash

This map unit is located in the northwest corner of the Quartz Pasture and represents 6% of the pasture acreage. Although this map unit does not make up a large percentage of the pasture, it is a key foraging area for livestock in a flat, easily accessible portion of the pasture within ½-mile of a water source. The PNVT is classified as Colorado Plateau Grassland and the map unit has typically been thinned of juniper in the past. Soils are located on gently sloping gradients, have a moderately-coarse to coarse textured, are deep, have minimal rock content within the soil profile, and are classified as Typic Haplustalfs/ Paleustalfs. Parent material is alluvium from Tertiary and Quaternary sediments. Soil erosion hazard is slight due to the flatter slopes. However, the less cohesive parent material due to granites within the sediments have an erosive property that requires soil organic matter and vegetation cover to maintain stability. These soils have a potential to be highly productive due to their higher available water holding capacity and non-limiting soil texture and pH levels.



TEUI 417, Quartz Pasture, Quartz Wash: The photo at left shows good cover and distribution of perennial grasses in the representative soil map unit for this pasture. The soil condition is field-verified as satisfactory in this grassland plant community with open characteristics

Yolo South Allotment

TEUI 461 – Yolo South

TEUI 461 is the key map unit within the South Mesa portion of the allotment that lies north of Moonshine Canyon, making up 23% of the allotment as a whole. This PNVT is classified as Pinyon-Juniper Evergreen Shrub. For a full description of this soil map unit see the Old Camp allotment section.



TEUI 461 in the north part of the Yolo South allotment has areas of dense juniper cover and little herbaceous groundcover as shown in this photo. Soil condition was field-verified as impaired. This soil map unit is present on South Mesa that is found north of Moonshine Canyon. There are no reliable water sources north of Moonshine

Canyon, and cattle are not placed in this part of the allotment for that reason. In areas of dense juniper, there is unlikely to be any improvement in herbaceous groundcover unless some juniper thinning occurs through mechanical or natural means (fire). No vegetation treatments are proposed in this analysis.

TEUI 475 – Yolo South

TEUI 475 is the key map unit within the portion of the allotment that lies south of Moonshine Canyon called Orejano Basin. This map unit makes 50% of the allotment as a whole. This PNVT is classified as Interior Chaparral. This is an extensive chaparral map unit covering 74,154 acres of the Prescott National Forest. It is found on hills and mountains and is common on the slopes of the Bradshaw Mountains. Elevation ranges from 4640-6470 feet. Slopes are moderate to steep ranging from 15-120%, averaging 41%. Soils are very shallow to shallow, very stony, sandy loam to coarse sandy loam and developed in granite. Rock outcroppings are common. Disturbance of TEUI 475 appears relatively low due to steep slopes that limit access.



TEUI 475, Yolo South: This map unit represents an interior chaparral plant community, with varying amounts of shrub cover. This phot shows an area with a moderate amount of perennial grasses. This map unit is found in Orejano Basin south of Moonshine Canyon. Cattle do access this area when they are present on the

allotment. The soil condition was field-verified as satisfactory in this key soil map unit.

The following table displays TEUI soil condition by allotment. Site specific management objectives, grazing intensity guidelines and physical adaptive management measures were identified as a means to achieve desired conditions. Improving and maintaining graminoid cover and achieving an upward trend, as identified in the Proposed Action Management Objectives, would assist in achieving soil management objectives.

Table 11: Soil Resource Concerns and Management Objectives

Hitt Wash Allotment					
Pasture	TEUI	Existing Condition	Resource Concerns	Management Objectives	Design Features
North	481	Satisfactory	Meeting desired conditions (DC)	Maintain soil condition	Standard utilization guidelines
B.Y.	481	Impaired, with some Satisfactory conditions on hillslopes and toes of slope.	A decrease of organic matter and formation of physical crust along with plant pedestaling indicates elevated soil loss, decreased infiltration, and a decrease of nutrient cycling. Valley bottoms show severe compaction, poor vegetation distribution, and decreased infiltration.	Maintain vegetation cover and spatial distribution in Satisfactory areas; in valley bottoms improve vegetation distribution and decrease compaction.	Discourage concentrated use; defer use when soils area wet; maintain VGC in Satisfactory areas; improve VGC in valley bottoms.
South	434	Satisfactory	Meeting DC	Maintain soil condition	Standard utilization guidelines

Old Camp Allotment					
Pasture	TEUI	Existing Condition	Resource Concerns	Management Objectives	Design Features
West	481	Satisfactory	Meeting DC	Maintain soil condition	Standard utilization guidelines
South	461	Unsatisfactory; patches of Satisfactory associated with rocky outcrops where shrubs and grasses are present.	Dense juniper and the loss of understory shrubs and grasses has resulted in extensive sheet erosion with some rilling and active gulying	Promote management activities that do not exacerbate a decline in soil function.	Moderate utilization levels to allow retention of current graminoid cover and root biomass and promote vigor of shrubs and litter production.
East	434	Unsatisfactory	Dense juniper and loss of perennial grass cover has resulted in widespread accelerated erosion in the form of active gulying, rilling, and sheet erosion.	Promote management activities that do not exacerbate a decline in soil function.	Moderate utilization levels to allow retention of current graminoid cover and root biomass and promote vigor of shrubs and litter production.
North	481	Impaired with some Satisfactory conditions	A decrease of organic matter, formation of physical crusts along with pedestalling indicates elevated soil loss, decreased infiltration, and a decrease of nutrient cycling. Compaction is present, and gullies are present but show signs of stabilizing.	Maintain VGC in satisfactory areas; promote retention of litter within interspaces in areas needing improvement; measure elements of compaction to determine if improving.	Discourage concentrated use; defer use when soils are wet; maintain existing VGC levels and vegetation distribution.
Quartz Wash Allotment					
Pasture	TEUI	Existing Condition	Resource Concerns	Management Objectives	Design Features
Center/Fritsche	412	Unsatisfactory	Significant	Measure	Discourage

			compaction; poor vegetation distribution and ground cover; poor nutrient cycling.	elements of compaction to determine if improving; improve amount and spatial distribution of vegetative groundcover.	concentrated use to minimize load-bearing stress; discourage use when soils are wet; integrate full year rest to allow freeze/thaw and wet/dry cycle to break up compaction. Promote incidental use (0-30%) to retain additional groundcover.
Quartz	417	Satisfactory	Meeting DC	Maintain soil condition.	Standard utilization guidelines
Yolo South Allotment					
Pasture	TEUI	Existing Condition	Resource Concerns	Management Objectives	Design Features
Orejano Basin	475	Satisfactory	Meeting DC	Maintain condition	Standard utilization guidelines
South Mesa	461	Impaired; myriad of soil condition; unsatisfactory associated with dense juniper; satisfactory within juniper openings	In areas of dense juniper there is a loss of understory vegetative cover and extensive sheet erosion and erosion pavement. In juniper openings areas support ample vegetative biomass and organic matter to protect soils.	Promote management activities that do not exacerbate a decline in soil function.	Moderate utilization levels to allow retention of current graminoid cover and root biomass.

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.

Alternative 1 Proposed Action

There are effects from both the modified grazing system and the addition of new range improvements. These are discussed for the sampled soils by allotment and pasture.

Range Improvement Effects

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. 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.

Hitt Wash Allotment

Satisfactory condition in the South Pasture, TEUI 434, and the North Pasture, TEUI 481, would be maintained under this alternative. This alternative continues the dormant season grazing that has been in effect on this allotment. The utilization levels proposed would allow for retention of 55-65% of the biomass produced on perennial grasses. Warm-growing season rest would occur every year.

In the B.Y. Pasture where there is impaired soil condition. To allow for improvement in soil condition, this pasture will only be grazed for a one-month period from either 11/1 to 12/15 or from 3/15 to 4/15. Using the pasture during these times when soils are typically dry will serve to minimize load-bearing stress on soils that can lead to compaction. Rest periods during the winter will allow for freeze/thaw and wet/dry cycles to break up soil compaction. The conservative use levels will provide for 55-65% of biomass to be retained on site. The spatial distribution and vigor of grasses should improve with this limitation on duration of pasture use. Placing some cut junipers in existing gullies will help trap sediment and could curtail down-cutting.

Old Camp Allotment

Satisfactory soil condition in the West Pasture, TEUI 481, would be maintained under this alternative. The conservative use levels (35-45%) would allow for retention of vegetative groundcover to protect soils. Stocking levels would be adjusted each year based on available forage so that allowable use levels would not be exceeded. Grazing deferment during the growing season would promote plant reproduction and vigor.

In the South Pasture, there is unsatisfactory soil condition in the representative soil map unit, TEUI 461. This condition is associated with areas of dense juniper where there has been a loss of herbaceous groundcover, leading to extensive sheet erosion with some rilling and active gullying. This alternative does not propose any vegetation treatments to remove the dense juniper overstory, so unsatisfactory soil conditions are likely to persist. Where grasses do exist, the conservative utilization levels proposed should allow for retention of grasses. Although, if juniper density continues to increase and competition for water, sunlight, and nutrients intensifies, grass cover could be further reduced over time.

In the East Pasture, the key soil map unit TEUI 434 is rated in unsatisfactory condition also due to the presence of dense juniper overstory and lack of herbaceous groundcover. As described above, this condition will persist or get worse in the absence of vegetation treatments to remove juniper. The proposed management would allow for deferment during the growing season to promote plant reproduction and vigor where grasses already exist. Where there has been extensive sheet erosion, soil surface characteristics may not be conducive to the establishment of herbaceous vegetation.

In the North Pasture, the representative soil map unit, TEUI 481, was rated as impaired, although some areas of the map unit are in satisfactory condition. The areas rated as impaired show signs of compaction, elevated soil loss, and decreased infiltration. Under this alternative, no salting or supplement placement would be allowed in this map unit to avoid concentrated cattle use. The pasture would be scheduled for use outside the times when the soils are typically wet (winter, early spring) so as to minimize the risk of further compaction. Conservative use levels (35-45%) would allow for the retention of existing herbaceous plants, and deferring use during the growing season will promote plant reproduction to provide for improved spatial distribution of vegetative groundcover.

Quartz Wash

Satisfactory soil condition in the Quartz Pasture, TEUI 417, would be maintained under this alternative. The conservative use levels (35-45%) would allow for retention of vegetative groundcover to protect soils. Stocking levels would be adjusted each year based on available forage so that allowable use levels would not be exceeded. The continuation of dormant season grazing will allow for rest during the warm growing season and will promote plant reproduction and vigor.

Current unsatisfactory soil condition in TEUI 412 in both the Center and Fritsche Pastures will improve under this alternative because incidental use (0-30%) would allow for retention of 70% or more of vegetative biomass on site. Providing more protective groundcover will improve the organic matter in the soil and improve infiltration over time. No salting or supplementation would occur to discourage concentrated cattle use. This action, as well as avoiding use when soils are wet will prevent further soil compaction. Complete rest of the pasture will allow for wet/dry and freeze/thaw cycles to break up soil compaction.

Yolo South

Satisfactory soil condition in TEUI 475 in Orejano Basin would be maintained under this alternative. The conservative use levels (35-45%) would allow for retention of vegetative groundcover to protect soils. Stocking levels would be adjusted each year based on available forage so that allowable use levels would not be exceeded. The variable use period of no more than 4 months a year will allow for periodic rest during both the warm and cool seasons. This will promote plant reproduction and vigor for a variety of plant species.

There is impaired soil condition in TEUI 461 that is the representative soil map unit north of Moonshine Canyon on the South Mesa portion of the allotment. This condition is associated with areas of dense juniper where there has been a loss of herbaceous groundcover, leading to extensive sheet erosion. This alternative does not propose any vegetation treatments to remove the dense juniper overstory, so impaired soil conditions are likely to persist. Where grasses to exist, the conservative utilization levels proposed should allow for retention of grasses. Although, if juniper density continues to increase and competition for water, sunlight, and nutrients intensifies, grass cover could be further reduced over time. Currently there is no reliable water source north of Moonshine Canyon, and the canyon itself forms a natural barrier for livestock. Cattle are not placed in this area under current management. Soil condition is likely to remain static and be influenced by the density of the overstory juniper.

Alternative 2 Winter Seasonal Grazing on Old Camp Allotment

The effects displayed for alternative 1 are identical to those for alternative 2 for the Hitt Wash, Quartz Wash, and Yolo South Allotments.

Old Camp

This alternative proposes dormant season grazing from October through April by up to 77 adult cattle. Providing warm-growing season rest will benefit perennial grasses by allowing them to set seed every year without grazing disturbance. Areas that currently exhibit a fair amount of perennial grass cover, such as TEUI 481 in the West and North Pastures, may improve in perennial grass vigor more so than under alternative 1 where plants are grazed during the period of seed set. Under existing management however, the perennial grass cover for TEUI 481 in both the West and North Pastures is in excess of the potential grass cover for the map unit. Both alternative 1 and alternative 2 propose the same conservative use levels, 35-45%, but the timing of use would differ.

For TEUI 481 in the North Pasture that is rated as impaired, there is an elevated amount of soil compaction. To alleviate this, the pasture should not be used when soils are wet, typically in the winter and early spring. The proposed dormant season grazing would mean that this pasture would likely be used when soils are wet, further exacerbating the soil compaction issue.

The areas needing the most improvement in soil condition are TEUI 434 in the East Pasture and TEUI 461 in the South Pasture. Both these areas are rated in unsatisfactory condition due to extensive bare ground and accelerated soil loss in areas of dense juniper canopy. This alternative does not propose any vegetation treatments to remove juniper. Providing growing seasons rest is unlikely to allow grasses to establish where there is dense juniper overstory because there is too much competition for sunlight, soil moisture, and nutrients to allow grasses to establish. Unsatisfactory soil condition is likely to remain without vegetation treatments.

The potential perennial grass cover for TEUI 434 in the East Pasture is 17%, and current grass cover is less than 4%. Dormant season grazing would likely bring about faster recruitment of perennial grasses where site conditions allow. For TEUI 461 in the South Pasture, current perennial grass cover is 12% compared to the site potential of 16% grass cover. The disparity is much less in this case, and desired conditions for vegetation are being met as far as similarity to site potential for the map unit.

Alternative 3 No Grazing

Impacts due to livestock grazing would not occur and new water developments and fences would not be constructed.

Existing satisfactory soil conditions would be continued. There would be the most retention of vegetative biomass under this alternative, so more litter and organic matter would accumulate in areas where herbaceous vegetation is already present. Localized soil compaction due to hoof bearing weight during wet periods would be limited to that from wildlife. There would be increased opportunity for litter and organic matter to be incorporated into the soil. Retention of additional vegetation biomass would improve soil organic matter and nutrient cycling, assist in alleviating localized soil compaction, contribute to favorable soil structure and infiltration, and promote soil stabilization. Open grassland areas such as are present on the Quartz Wash Allotment in TEUI 412 would show faster improvement under this alternative than alternative 1. Vegetation is mainly meeting desired conditions in open areas on the other allotments where there is not an issue of dense juniper overstory.

In areas where dense juniper stands are leading to reduced herbaceous groundcover and affecting soil condition, the elimination of grazing will not improve soil condition appreciably. Restoration activities to remove juniper, provide protective slash on the soil surface, and

perhaps the addition of native grass seeding may be required to improve some areas to satisfactory condition in the absence of grazing.

Cumulative Effects on Soil Resources

See entry on pages 56-58: “Cumulative Effects on Soil, Watershed Condition, and Water Resources”.

3.5 What are the Impacts to the Watersheds and Water Resources?

Existing Condition:

Watershed condition includes both the upland portion of the watershed and the streamcourses with their associated riparian and aquatic vegetation. The project area contains portions in satisfactory, impaired and unsatisfactory watershed condition as influenced by the existing condition of the soils. The upland areas which were rated unsatisfactory are primarily dense pinyon-juniper of younger age classes with high canopy density and very little herbaceous ground cover. Soils rated as impaired, though not currently in satisfactory condition, can more readily recover through management than if rated as unsatisfactory. Where impaired, and especially where unsatisfactory, the soil hydrologic functions of infiltration and percolation have been impacted, resulting in greater surface runoff from intense rainstorms, along with greater soil detachment and removal through erosion. Watershed condition is evaluated on the scale of a 6th Hydrologic Unit Code (HUC) subwatershed. These subwatersheds are nested within larger 5th HUC watersheds and are displayed in the following table:

Table 12: Watersheds and Subwatersheds Containing the Allotments

Allotment	5 th Code Watersheds	6 th Code Subwatersheds	Percent of Allotment in Subwatershed
Hitt Wash	Williamson Valley Wash	Hitt Wash	44%
		Lower Williamson Valley Wash	8%
		Mud Tank Wash	42%
		Upper Williamson Valley Wash	5%
Old Camp	Williamson Valley Wash	Horse Wash	73%
		Upper Williamson Valley Wash	23%
		Strickland Wash	4%
Quartz Wash	Lower Big Chino	Pine Creek	12%
		Lower Walnut Creek	88%
Yolo South	Sycamore Creek	Cottonwood Canyon	20%
		Loco Creek	79%
		Scotts Basin	<1%

Streamcourses and Riparian:

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, soil scientist, 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.

Hitt Wash Allotment: Hitt Wash in the Hitt Wash subwatershed is the primary drainage passing through the allotment. It is ephemeral and flows to the Williamson Valley Wash approximately 5 miles downstream from the allotment. The approximately 0.25 mile segment of Hitt Wash on the allotment is fenced in with the private land and is only used for short time periods by a portion of the herd. There are some older age class walnut trees on the terraces above the active channel. A small amount of water was flowing upstream of the private land during the field visit in March, but the flow was not present downstream from private land. Williamson Valley Wash flows an additional 15 miles to reach the Big Chino.

Old Camp Allotment: There are two primary drainages crossing the Old Camp Allotment. In the Upper Williamson Valley subwatershed, a 1.15 mile segment of Williamson Valley Wash crosses through the North Pasture. It is a relatively wide ephemeral streamcourse, with scattered woody riparian plants such as velvet ash, a few Fremont cottonwoods, and small patches of coyote willow and arroyo willow. Since it is ephemeral, it is not suitable for a PFC assessment. No standing water was observed at the time of the field visit in April.

In the Horse Wash subwatershed, the Horse Wash drainage crosses through the West and East Pastures, and joins Williamson Valley Wash just downstream from the allotment. A relatively short pothole, wet weather bank seep area is present on Horse Wash in the West Pasture just downstream from the road crossing. Approximately 100 meters in length, it supports velvet ash of multiple ages, deergrass, waterweed, plus sedges and rushes along portions of the streambanks where wet weather seeps appear to be present. Because there is a pothole of water in the sandy channel for periods of time, livestock will concentrate here as there is no nearby upland water development. Heavy browsing of ash seedlings and saplings has been observed in this segment. Williamson Valley Wash is joined by Hitt Wash approximately 6 miles downstream from the allotment. From there it is another 15 miles to the Big Chino Wash. The ephemeral reaches are not suitable for PFC assessment, but they are important as areas of channel recharge to groundwater.

Quartz Wash Allotment: There is no identified riparian within the Pine Creek subwatershed portion of the allotment. Walnut Creek is within the Lower Walnut Creek subwatershed. Walnut Creek is contained within the southern portion of the Center Pasture. The ¼ mile segment within the allotment is intermittent, but becomes ephemeral shortly downstream. There is riparian vegetation associated with this segment. Walnut Creek was assessed as Functional-At-Risk with a downward trend. The private land on both the upstream and downstream ends supports a much more dense and vigorous riparian community and provided some comparison with this reach. However the overall segment of channel does display the effects of historic channel downcutting. Quartz Lead Wash is an ephemeral drainage that flows through the Quartz and Center Pasture and joins Walnut Creek just south of the Fritsche Pasture. The observed portion of Quartz Lead Wash was a wide sandy-gravelly streamcourse with some adjacent scattering of woody riparian species, especially walnut. No condition was assessed since the drainage is ephemeral in nature.



Photo – at lower Forest boundary looking upstream. Numerous willow seedlings, all heavily browsed. Terrace on right, well above floodplain. Mixed age, multi-species woody riparian with ash, cottonwood, willow, walnut, boxelder. This reach was assessed by the PFC method as Functional-At-Risk with a downward trend.

Yolo South Allotment: Within the Loco Creek subwatershed is found Moonshine Canyon and associated in-channel springs, Loco Creek, Laurel Spring, and Boundary Spring. The primary drainages are in steep walled confines and are bedrock controlled with intervening areas predominantly armored with boulders and large rock material. Moonshine Spring is located just inside the Forest boundary at the intersection of Moonshine Canyon and a major tributary from north. The spring was inspected in the field on August 5, 2014 and a PFC assessment was conducted on the upper 0.6 mile of drainage from the forest boundary downstream. The presence of woody riparian vegetation indicated the presence of free soil water in the drainage above the spring. This reach is long term intermittent with interrupted pools lasting longer than the surface flow in between. However, the woody riparian is essentially continuous. The stream is armored with bedrock and heavy boulders. This stream segment was assessed as Proper Functioning Condition, meaning that it is essentially at potential. The valley bottom is wide enough to accommodate flood channel(s); however terraces are not developed at an elevation which would support mature woody vegetation above the periodic scouring floods. This periodic scouring appears to remove most of the established woody vegetation and “reset the ecological clock” with continuing episodic establishment of new seedlings. Sycamore is the most common woody riparian species with ash, red willow, shrub willow (arroyo and/or coyote), plus a small amount of alder and cottonwood. All ages up to pole and small mature are represented, with seedlings and small saplings quite numerous.



Photo – Moonshine Spring segment of Moonshine Canyon showing the armored nature of the channel and the abundance of riparian woody vegetation including sycamore, ash, and willow.

The portion of Moonshine Canyon below this PFC assessed reach down to Moonshine Spring #2 was traversed and described. Because it is essentially ephemeral in surface flow it was not given a PFC assessment; however it was described and documented, as there is a riparian vegetation community present. This segment is approximately 0.8 miles in length, with channel configuration varying from multiple parallel low flow channels in the upper portion to bedrock pools interspersed with sand and gravel ephemeral riffles. There is a falls of approximately 25-30' in the main channel immediately upstream from Moonshine Spring #2. This falls is a natural barrier to livestock and Moonshine Spring #2 is not accessible to livestock.

Moonshine Spring # 3 is approximately 1.1 miles downstream from Moonshine Spring #2 at an elevation of approximately 4475'. The channel is heavily scoured with bedrock and large boulders predominant. The reach gradient is approximately 3.4 percent from Moonshine Spring #2 down to #3. There is a livestock access trail to the stream channel bottom in the general location of Moonshine Spring #3. It was visited in April, 2014 as well as in August. Livestock use appeared to be negligible. The ephemeral channel is essentially bedrock and boulder controlled with intervening deposits of sand and gravel. The channel is periodically scoured removing much of vegetation. As a result the woody riparian does not reach mature size or support a gallery forest. Between periodic scouring episodes both woody and herbaceous species become established and thrive, especially sycamore and deergrass.



Photo – Vicinity of Moonshine Spring #3 at a persistent pool that supports some woody riparian vegetation, deergrass, and cattails. There was no PFC assessment at this reach since it is an ephemeral segment.

Laurel Spring is located in a tributary of Moonshine Canyon. It is essentially a seep, but free soil water supports a vegetative community with most common species being sycamore, Gooding willow, waterweed (*Baccharis sergiloides*) and deergrass. There is no water development. Livestock have pawed out a muddy area in the vicinity of the seep where water accumulates in depressions and hoofprints. Although there is evidence of livestock use from grazing, browsing, and trampling, there is reproduction of both woody and herbaceous species and the riparian function appears to be maintained with current use seasonally for 4 months only.

Loco Pool Spring: Located on Loco Creek approximately 0.5 miles downstream from its confluence with Moonshine Canyon. It is a very large and deep bedrock pool with little evidence of supporting riparian vegetation. According to a ranch representative, it is rarely used by livestock due to limited access.

Boundary Spring: Located on hillside adjacent to two track access road into Orejano Basin. This appears to be a wet weather seep and no surface water was observed.

Loco Creek upstream from its confluence with Moonshine Canyon drops from 4425' to 3975' in approximately 1.5 miles, or a gradient of more than 5.5 percent. It is controlled by bedrock and appears to have limited access by livestock.

Cottonwood Canyon subwatershed is at the north end of the allotment on South Mesa. It contains Poplar Spring in a side drainage above Cottonwood Canyon. It is located on a stepp hillside and is considered not accessible to livestock. The Scotts Basin subwatershed portion of the allotment is very small in size and does not contain any riparian resources.

Water Quality:

Hitt Wash and Old Camp: Neither the most recent (2012) nor the immediately previous (2010) ADEQ assessment included any watercourses within or downstream from these allotments within the Big Chino subbasin (4th level HUC).

Quartz Wash: Neither the most recent (2012) nor the immediately previous (2010) ADEQ assessment included any watercourses within or downstream from the allotment within the Big Chino subbasin (4th level HUC). Assessments were done on several reaches of the Verde River downstream from Sullivan Dam, about 20 miles downstream from the allotment via primarily ephemeral channels.

Yolo South: No stream segments within or near the allotment were assessed by ADEQ in the 2010 Status of Water Quality Arizona’s Integrated 305(b) Assessment and 303(d) Listing Report, December 2011 to determine if Beneficial Uses were being met.

Condition of Subwatersheds

All 6th HUC watersheds on the Prescott National Forest have received an initial condition classification using the National Forest Service protocol (USDA Forest Service 2011a and 2011b). The system is used to classify and prioritize watersheds for investments in restoration activities, and to track changes over time. Based on categories of aquatic physical, aquatic biological, terrestrial physical, and terrestrial biological, ratings are assigned to 12 watershed condition indicators, compiling the results of 24 specific attributes. Ratings of 1, 2, and 3 (expressed as “Good”, “Fair”, and “Poor” which are also described as Functioning Properly, Functioning at Risk, and Impaired Function) are assigned based on a combination of quantitative and qualitative criteria. The subwatersheds containing the project area are rated as follows:

Table 13: Watershed Condition for 6th Code HUCs

6 th Code Subwatershed	Condition	Allotment
Cottonwood Canyon	Fair - Functioning at Risk	Yolo South
Hitt Wash	Fair- Functioning at Risk	Hitt Wash
Horse Wash	Fair- Functioning at Risk	Old Camp
Loco Creek	Fair- Functioning at Risk	Yolo South
Lower Walnut Creek	Fair – Functioning at Risk	Quartz Wash
Lower Williamson Valley Wash	Not assessed - Mainly non-FS lands	Hitt Wash
Mud Tank Wash	Fair – Functioning at Risk	Hitt Wash
Pine Creek	Good – Functioning Properly	Quartz Wash
Scotts Basin	Not assessed - Mainly non-FS lands	Yolo South
Strickland Wash	Fair- Functioning at Risk	Old Camp
Upper Williamson Valley Wash	Fair- Functioning at Risk	Hitt Wash, Old Camp

Water Resources and Watershed 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)

Management Objectives for Riparian Areas:

- Maintain riparian vegetation cover and density in those areas that are meeting desired conditions by applying utilization and stubble height guidelines.

Proposed monitoring may vary in method and intensity from narrative inspections with repeat photography to quantitative methods such as the Multiple Indicator Monitoring (MIM) system (Burton 2011).

Direct & Indirect Effects on Water Resources and Watersheds:

Alternative 1

Hitt Wash: The proposed dormant season grazing strategy will allow for warm growing season rest every year. The impaired soil condition areas in the B.Y. Pasture will have resource protection measures applied such as limiting the timing of use to when soils are dry and applying conservative utilization measures. As infiltration into the soil improves there will be slightly less surface runoff into tributary drainages that flow into Hitt Wash as a result of storm events. The proposed gully treatments should help retain soil on site and hasten gully stabilization. There are no identified riparian resources on the allotment that would be adversely impacted by grazing.

Improvements include fence construction and a new reliable water source. Water source development will be compliant with Arizona Water Law and Forest Service groundwater management policy. At maximum stocking levels, the water consumption by livestock would amount to approximately $\frac{3}{4}$ of an acre-foot per grazing season, or about one-third of one percent of the estimated average water yield for the allotment based on precipitation received on the allotment. Application of Best Management Practices should keep soil and water impacts localized and temporary during the construction of new range developments.

Old Camp: Alternative 1 would retain yearlong grazing. Application of resource protection measures, including utilization standards and timing of grazing to reduce soil compaction on TEUI 481, will lead to an increase in infiltration, resulting in slightly less surface runoff into the tributary drainages that flow into Williamson Valley Wash as a result of storms. With reduced soil detachment there will be slightly less sediment reaching these drainages that would eventually be transported to Williamson Valley Wash. The impaired soils in TEUI 434 in the East Pasture and TEUI 461 in the South Pasture will benefit from the site-specific resource protection measures. This would lead to an increase in infiltration and a decrease in soil surface detachment, leading to a slight decrease in surface runoff and sediment moving into first and

second order channels. This would be more the case for TEUI 434 as the very dense juniper stands will remain on TEUI 461 which limit the amount of herbaceous ground cover. Localized use of cut juniper trees and low one rock dams in first order gullies will trap some of the sediment, provide for establishment of herbaceous vegetation, and reduce the amount of sediment moving toward Horse Wash and Williamson Valley Wash.

A new water development in the north half of the North Pasture will provide another water source away from the existing well in Williamson Valley Wash and reduce dependence on that source. This may reduce browsing of any periodic woody riparian regeneration, such as arroyo willow, ash, or cottonwood. However the overall streamcourse is not expected to experience major changes due to allotment management. The large upstream watershed, the limitations of the streamcourse, and the existing lack of major observed livestock impacts indicate that natural processes within the watershed will be the primary determining factor in any changes that occur during the planning period. A new water development in the West Pasture would reduce the dependence of livestock on the pothole wet weather seep in Horse Wash. Periodic impacts such as bank trampling and browsing of woody regeneration, especially ash, would be reduced. Browsing of ash reproduction along the segment of Horse Wash upstream should be reduced. Calculations of water consumption were made using conservative estimates (e.g. most likely to overestimate livestock use). At the maximum stocking rate, water use by livestock amounts to approximately 0.9 acre-foot per year, or about one-third of one percent of the estimated average water yield for the allotment.

Range Structural Improvements: There are four water developments proposed, one each major pasture. They will be compliant with Arizona Water Law and Forest Service groundwater management policy. Access and clearing of development sites will be required. Application of Best Management Practices should keep impacts to soil and water resources localized and temporary.

Quartz Wash: The proposed grazing system calls for seasonal use and deferred rotation. Warm season vegetation will be rested every year and cool season will be rested periodically, allowing vegetative recovery between periods of use. The site specific resource protection measures to improve vegetative distribution and reduce soil compaction on TEUI 412 will gradually decrease surface runoff from intensive storms and slightly reduce suspended sediment material which reaches Walnut Creek during occasional floods. Managing to minimize or eliminate livestock use along the accessible portion of Walnut Creek will allow the riparian vegetation to recover in density and vigor. Woody species would be able to grow beyond the sapling stage and towards mature trees. In the upper portion, which has surface water and near surface saturated conditions for a much longer period of time, facultative wet herbaceous vegetation, which currently has some presence, would increase in density and vigor, and regeneration would be improved. The current portion of streambanks which are bare would gradually be revegetated. The overall stream rating should gradually improve from its current very low Functional-at-Risk rating toward a potential Proper Functioning Condition. Fencing of the segment of Walnut Creek within the Forest boundary but outside the allotment would remove any impacts from livestock and provide for riparian function within the ecosystem.

New water developments in the Center and Quartz pastures will be compliant with Arizona water law and Forest Service groundwater management policy, and are expected to be wells with accompanying storage and pipelines, and/or trick tanks. Expected water consumption by livestock was calculated using conservative estimates (e.g. most likely to overestimate livestock use). At the maximum stocking rate it amounted to a little over one acre-foot per grazing

season, or less than one-half of one percent of the estimated average water yield for the allotment.

Yolo South: The existing condition of the springs in Moonshine Canyon should continue. Natural disturbances from periodic floods will affect age class distribution of woody riparian, with occasional scouring of some streamside vegetation. However, the bedrock and rock armoring and the existing vigorous woody and herbaceous vegetation provide a very resilient system which can respond to these disturbances without decline in function. The Moonshine Spring segment should continue in its Proper Functioning Condition at a very high level. The ephemeral reaches interspersed with long term pools and springs should also maintain both vegetative and hydrogeomorphic integrity.

Fencing of Laurel Spring and piping the water to a location outside the riparian area would eliminate the periodic mechanical disturbance from livestock pawing out water holes in the area of the seep. Herbaceous riparian plants would be expected to increase in this wet portion of the drainage. Regeneration of woody riparian would continue, with less likelihood of browsing palatable species when livestock are in the allotment.

Alternative 2 – Old Camp Allotment Seasonal Grazing

Growing season rest for warm season plants will facilitate growth, recruitment, and maintenance or expansion of ground cover from these species. In the North Pasture TEUI 481 also has a need for reduced compaction. Under this alternative there would be potentially greater use during the winter-early spring wet soil period and compaction may increase, or at least remain constant, rather than decrease. Improved ground cover of the warm season component, but increased compaction of heavy use livestock areas would have counteracting effects on infiltration rates and surface runoff and sediment production. A slight decrease in storm runoff and soil detachment is expected.

Effects on soils which lead to storm runoff and soil detachment in the West and South Pastures would be generally similar to Alternative 1, with slightly more improvement expected on TEUI 434 in the East Pasture.

Rest during the April – September growing season would provide protection from browsing by livestock, especially for ash, which is present in limited density along Horse Wash in the West Pasture, and would facilitate the development of greater age class diversity. It would also reduce livestock impacts on the pothole wet weather seep on Horse Wash, with reduced effect of bank alteration by trampling. Herbaceous facultative wet species, e.g., sedges and rushes, would move toward potential for the site.

Although there is currently very limited reproduction of woody riparian species along Williamson Valley Wash, periodic regeneration that does occur would be less exposed to livestock impacts.

Alternative 3 – No Action/No Grazing

Impacts due to livestock grazing would not occur and new water developments would not be constructed. In the watershed uplands existing satisfactory soil conditions would be continued. Impaired soil conditions would improve with more vegetation and organic matter improving soil structure and infiltration and reducing surface runoff and improving soil stability. Riparian areas would not be affected by permitted livestock. On the Quartz Wash Allotment, Walnut Creek would improve from its current vegetative and streamcourse condition as described for Alternative 1, though probably more rapidly unless exclosure fencing was implemented. The

extent and abundance of riparian vegetation would be influenced by the reoccurrence of scouring floods and the amount of surface water present in the channel.

Cumulative Effects on Soil, Watershed Condition, and Water Resources

In this analysis, watersheds are used as the basis to evaluate the cumulative effects of projects on soil, riparian ecosystems, and water quality/quantity. The cumulative effects analysis area for the Chino Small Allotments includes the 6th Level HUC subwatersheds. Activities that could have additive effects to project actions include past vegetation treatments, prescribed burning, wildfire, roads, mining, grazing, and recreation.

Vegetation treatments may initially have negative impacts to the soil, vegetation and watershed resources by causing mechanical disturbance to the vegetation, displacing vegetation ground cover, and creating soil compaction. However, these treatments could result in a positive influence in the long term by improving herbaceous response, plant vigor, and vegetative ground cover. 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. 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.

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 experiencing gulying 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.

The two primary types of mining claims that occur are locatable and non-locatable. Locatable minerals are claimable minerals within the public domain and are normally metals. Locatable minerals are subject to the 1872 mining law. Non-locatable minerals are non-claimable minerals within the public domain and are normally stone, flagstone quarries etc. Disturbances affiliated with mining expose, compact, displace, and create unstable soil conditions that could potentially increase run off, erosion, sedimentation, and negatively impact vegetative productivity. This also has the potential to impact vegetation dynamics. Some locatable mining operations have the potential to create heavy metal contaminants and high sulfide levels that can lead to water quality degradation through decreased pH levels. All public domain mining operations must adhere to a reclamation plan to mitigate potential adverse impacts upon soil and water resources.

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. The allotments within the subwatersheds that are managed by the Forest Service have allotment management plans in place or are managed through annual operating instructions that provide for the attainment of satisfactory watershed and soil condition where not already present. Adaptive management is employed so that the stocking level each year is commensurate with forage supplies, and allowable use levels are achieved. There are standards for use in riparian areas to maintain adequate vegetation along streams to provide for trapping sediments and maintenance of hydrologic functions. Livestock grazing areas on State

and public lands of other ownership will also have grazing management plans that provide for vegetation, soil, and water quantity/quality health.

Recreation disturbance can impact and change vegetation population dynamics and can also expose, compact, displace, and create unstable soil conditions that could potentially increase run off, erosion, and sedimentation. Within the allotment and the Prescott National Forest portion of the 6th HUC watersheds dispersed recreation is the primary recreational impact. Dispersed camping, hiking, horseback riding, ATV riding on low standard roads and on trails, and hunting during seasons are the primary use. Where widely dispersed and not located in sensitive areas there are limited effect on soil and water resources.

Summary of Cumulative Effects

Water Quantity

Hitt Wash: Expected water consumption by livestock was calculated allotment wide. All of the 6th HUC watersheds drain to Williamson Valley Wash 5th HUC when there is enough storm runoff. Calculations were made using conservative estimates (e.g. most likely to overestimate livestock use). At the maximum stocking rate it amounted to approximately $\frac{3}{4}$ of an acre-foot per grazing season, or about one-third of one percent of the estimated average water yield for the allotment based on precipitation received on the allotment. The allotment area of about 5500 acres is a very small portion of the nearly 90,000 acres that make up the 4 subwatersheds that contain the allotment.

Old Camp: Expected water consumption by livestock was calculated allotment wide. All of the 6th HUC watersheds drain to Williamson Valley Wash 5th HUC when there is enough storm runoff and contribute to groundwater recharge. Calculations of water consumption were made using conservative estimates (e.g. most likely to overestimate livestock use). At the maximum stocking rate, water use by livestock amounts to approximately 0.9 acre-feet per year or about one-third of one percent of the estimated average water yield for the allotment, and approximately 0.6 acre-feet per year under alternative 2. The allotment is about 6,300 acres in size while the 3 subwatersheds containing the allotment cover over 46,000 acres. The amount of consumption is not significantly greater than historical but is greater than with no livestock use.

Quartz Wash: Under the maximum potential stocking level livestock consumption of water is calculated as a little more than one acre-foot per year with much of it expected to come from wells. The allotment is about 7,000 acres in size, while the 2 subwatersheds containing the allotment represent over 67,000 acres. The allotment is within the area draining toward the aquifer in the upper Big Chino basin, along the western edge. New water developments will create minor changes in location of consumptive use but the change from historic use will cause very little changes in groundwater in and moving toward the Big Chino aquifer.

Yolo South: The only new water development proposed is in the South Mesa area that is not currently used by livestock. This water source may be built at a later date if juniper thinning creates usable forage in the South Mesa area. The maximum number of livestock authorized would consume about 0.4 acre-feet of water during the hottest summer months, which amounts to less than a hundredth of a percent of the precipitation that falls on the allotment in a year, and less than two-tenths of a percent of the estimated annual water yield from the allotment. The allotment is about 3,500 acres in size, while the 2 subwatersheds that contain it are over 53,000 acres in size.

Summary: Because there are no measurable direct or indirect effects to water quantity at the subwatershed scale, there would be no cumulative effects.

Water Quality

Hitt Wash and Old Camp: The nearest assessed water is downstream approximately 20 miles from the allotment via primarily ephemeral channels where the Verde River between Granite Creek and Hell Canyon was assessed as Attaining for Agriculture Irrigation and livestock watering and for fish consumption but Inconclusive for Aquatic and Wildlife Warmwater and for Full Body Contact due to inadequate sampling. Additional sampling is required in order to obtain adequate coverage of all seasons. The information from the ADEQ assessment indicates that the waters of the upper Verde River are not on the threshold of being impaired. Very slight and temporary amounts of sediment might occur as a result of soil disturbance associated with new structural range improvements, although most would not leave the project area.

Quartz Wash: The nearest assessed water is downstream approximately 20 miles from the allotment at the same location as described for Hitt Wash and Old Camp. Improvement of the short segment of Walnut Creek Allotment would slightly reduce erosion and sediment movement.

Yolo South: Neither Loco Creek, Cottonwood Canyon nor Sycamore Creek (the 5th level HUC within which these two are nested) are assessed as impaired. The project is not expected to cause detectable impacts on water quality.

Conclusion

In summary, the proposed project would incrementally improve the cumulative effects because it would result in a gradual net improvement of the soil and water resources. Any potential adverse impacts to the soil and water resources due to the construction of range structural improvements would be temporary, localized, and would be mitigated by implementing soil and water conservation practices (BMPs). The activities affiliated with the Chino Small Allotments would not add to the cumulative watershed effects of the other listed actions because of the net improvement upon the soil, vegetation, and water resources.

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

The Wildlife, Fish, and Rare Plant Specialist Report (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. To identify what species may occur in the project area, the wildlife biologist reviewed the PNF Threatened, Endangered, and Sensitive (TE&S) species list and documented species occurrences within and adjacent to the project area. Arizona's Heritage Data Management System (HDMS) was queried for species occurrence. No Federally-listed species or their habitat was determined to be present in the project area.

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.

Existing Condition: The allotment contains habitat for a variety of wildlife species including big game mammals such as deer, elk, javelina, and bear. The habitat types within the allotments are shown in this Table 14. In addition, there are short reaches of perennial water that is suitable or occupied aquatic habitat for the lowland leopard frog in Walnut Creek, Moonshine Canyon, and Loco Creek. The majority of the aquatic habitat along Moonshine Canyon and Loco Creek is inaccessible to livestock due to the rugged, steep terrain.

Table 14. Potential Natural Vegetation Type (PNVT) Acreage on the Chino Small Allotments

Potential Natural Vegetation Type	Acres	% of Combined Allotments
Pinyon-Juniper Chaparral	14,793	67
Pinyon-Juniper Woodland	2,831	13
Interior Chaparral	1,769	8
Mixed Broadleaf Deciduous Riparian Forest	475	2
Pinyon-Juniper Grassland	800	4
Colorado Plateau Grassland	1,432	6
Total acres	22,100	100

Direct and Indirect Effects to Wildlife Habitat

Livestock grazing can affect wildlife and their habitat through direct competition for forage, alteration of key wildlife habitat components, disturbance and displacement of individuals due to the presence of livestock, or unintentional trampling of individuals and young. The analysis of effects is based on how the action of the alternatives may affect species and their habitats in the project area. There would be livestock grazing short-term impacts to vegetation and soil conditions in the uplands of the project area. The establishment of conservative utilization standards on upland areas in satisfactory condition, and the implementation of lighter grazing intensities on those areas not meeting desired conditions should result in vegetative improvement over time.

In riparian areas, livestock grazing outside of the dormant season may reduce insect diversity (important for nesting birds in the spring) and suitable habitat by reducing herbaceous ground cover, riparian tree/shrub density and recruitment. Properly managed grazing that provides for retention and recruitment of riparian vegetation towards the site potential will provide for wildlife habitat needs. High utilization in riparian areas compromises the structural habitat diversity, vertical cover component and the reproductive potential of riparian dependent wildlife species. For riparian avian fauna, ground nesting species are most affected by livestock grazing, followed by shrub-nesting and canopy-nesting species (Krueper, et al. 2003). Bird species use different strata of vegetation and these strata have different vulnerabilities to grazing. The lower strata can be affected by short-term grazing. The shrub strata and most of its associated bird species can be adversely affected by cattle grazing, while the upper canopy and its birds are not. Reducing the level of use on riparian vegetation will be essential for the maintaining the integrity of important wildlife habitat in the riparian corridors and springs within the Chino Small Allotments. Beginning with reduced impacts by implementing dormant season grazing, proposed water developments in the uplands would reduce livestock dependence on water sources at or near the riparian areas and springs.

Alternative 1 – Seasonal grazing Hitt Wash, Quartz Wash, Yolo South and yearlong on Old Camp Allotment

This alternative would be beneficial to wildlife because livestock grazing would occur during the late fall and winter months when the vegetation is dormant for all the allotment, except Old Camp. During this time big game species will usually make a seasonal movement down to lower elevations to avoid inclement weather. With dormant season grazing, there would be no competition on the allotment with livestock for palatable browse species during the spring and the summer months, when it becomes nutritionally important for lactating deer and elk with young fawns and calves.

With the exception of some resident species, most of the bird species present during the spring and summer months will also migrate south for the winter and will not be present during the time livestock are grazing the Chino Small Allotments. Under Alternative 1, with the exception of the Old Camp Allotment, livestock grazing will occur primarily during the dormant season. The seasonal grazing on the Yolo South Allotment can occur in the summer months, but is most often outside the summer months because water availability is better. Riparian areas in the Chino Small Allotments would mainly be accessed during the dormant season when livestock impacts to wildlife would be minimal and/or nonexistent. All wildlife species associated with the grass/shrub understory, sedges and shoreline aquatic vegetation, and aquatic habitat would benefit the most. Under this alternative the springs and riparian habitat in the Old Camp Allotment will need to be monitored under the proposed yearlong four pasture deferred rotation system. Monitoring will identify the need for any necessary changes in livestock grazing allowing managers to adjust accordingly by implementing adaptive management when and if problems arise.

Alternative 2 – Seasonal grazing on the Old Camp Allotment; others same as alternative 1

Benefits for wildlife would increase for the Old Camp Allotment by changing from yearlong deferred rotation to implementing seasonal grazing during the dormant season.

Alternative 3 – No Action/No Grazing Alternative

There would be a benefit to wildlife and aquatic habitat under this alternative in sensitive habitats where livestock concentrations have occurred in the past. Over time with no livestock grazing, the understory habitat component of forbs grasses and sedges, etc. in the riparian corridor will continue to respond. Livestock impacts on vegetation would be removed with only wildlife grazing occurring at light intensities. The upland and riparian areas have greater potential for recovery under the no action alternative. Riparian tree species reproduction (seedlings, saplings) such as cottonwoods and willows would still be browsed by wildlife, but would be less impacted with the absence of domestic livestock grazing.

Regional Forester Sensitive Animal & Plant Species:

Table 15. Summary of effects for Region 3 Forest Service Sensitive Species that may or do occur within or near the Chino Small Allotments.

Species Name	Status	Alternatives 1&2 Action Alternatives	Alternative 3 No Action
Pale Townsend’s big-eared bat	Sensitive	No Impact	No Impact
Lowland leopard frog	Sensitive	MIHH	No Impact
Arizona phlox	Sensitive	No Impact	No Impact

Broad-leafed Lupine	Sensitive	No Impact	No Impact
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MIH – May impact individual or habitat

Management Indicator Species:

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

Table 16. Summary of effects on management indicator species (MIS) analyzed on the Chino Small Allotments.				
Species – Indicator Habitat	Alternatives 1&2 Action Alternatives		Alternative 3 No Action	
	Project Level Effects	Forest-wide Trends	Project Level Effects	Forest-wide Trends
Mule Deer – early seral pinyon juniper & chaparral vegetation types.	<p><i>Grazing:</i> No change to habitat quality or quantity of early seral stage of pinyon-juniper and chaparral vegetation.</p> <p>May increase habitat quality slightly due to construction and maintenance of water developments for improved livestock distribution.</p> <p>No impacts to early seral PJ with dormant seasonal grazing by livestock, and there would be minimal if any impacts to quantity and or quality of early seral pinyon-juniper and chaparral habitat component with year around livestock grazing in Old Camp Allotment by implementing Alternative 1.</p>	No effect to forest-wide habitat or population trends.	<p>No change to habitat quantity of early seral stage of pinyon-juniper and chaparral vegetation.</p> <p>Habitat quality would improve in areas where livestock grazing pressure has previously occurred.</p>	No effect to forest-wide habitat or population trends.

Table 16. Summary of effects on management indicator species (MIS) analyzed on the Chino Small Allotments.				
Species – Indicator Habitat	Alternatives 1&2 Action Alternatives		Alternative 3 No Action	
	Project Level Effects	Forest-wide Trends	Project Level Effects	Forest-wide Trends
Spotted Towhee – late seral chaparral vegetation type.	<p><i>Grazing:</i> No change in habitat quantity of late-seral chaparral. Habitat quality for this MIS should not be impacted from dormant season grazing system.</p> <p>Alternative 1: Even though the Old Camp Allotment will remain in yearlong grazing under this alternative, the late seral chaparral is a barrier to livestock movement and use; therefore livestock will have minimal if any impact to nesting spotted towhee or the quality and quantity of their habitat, late seral chaparral vegetation type.</p> <p>Alternative 2 will have no impacts to nesting spotted towhees with dormant seasonal grazing occurring outside of the nesting season, or the quality and quantity of the late seral chaparral vegetation type.</p>	No effect to forest-wide habitat or population trends.	<p>No change in habitat quantity of late-seral chaparral.</p> <p>Habitat quality may improve with an increase of insect species diversity and additional vegetative cover for nests.</p>	No effect to forest-wide habitat or population trends.
Juniper (Plain) Titmouse - for late seral pinyon juniper and for the snag component in pinyon juniper.	<p>Alternatives 1&2: No change in habitat quantity of late-seral pinyon juniper and its snag component with year around or seasonal dormant season grazing.</p> <p>With the resource protection measures, habitat quality for these MIS would be maintained or improved.</p> <p>No change in habitat quantity of late-seral pinyon juniper and the snag component quantity.</p> <p>Therefore cavity nesters and secondary cavity nesters such as the Juniper Titmouse will not be impacted.</p>	No effect to forest-wide habitat or population trends.	<p>No change in habitat quantity of late-seral pinyon juniper.</p> <p>Habitat quality may improve with an increase of insect species diversity and additional vegetative cover in the understory and snags will increase over time.</p>	No effect to forest-wide habitat or population trends.

Table 16. Summary of effects on management indicator species (MIS) analyzed on the Chino Small Allotments.				
Species – Indicator Habitat	Alternatives 1&2 Action Alternatives		Alternative 3 No Action	
	Project Level Effects	Forest-wide Trends	Project Level Effects	Forest-wide Trends
Macroinvertebrates late seral riparian habitat, aquatic habitat.	No change in quantity of aquatic habitat and late-seral riparian habitat. Habitat quality would be maintained or improved with dormant season grazing and deferred yearlong grazing, resource protection measures, and range improvements to reduce use of riparian areas.	No effect to forest-wide habitat or population trends.	No change in habitat quantity of aquatic habitat or late-seral riparian habitat. More rapid improvement in aquatic and riparian habitat quality.	No effect to forest-wide habitat or population trends.

Migratory Birds:

The Forest Service is required to address the effects of agency actions and plans on migratory birds and identify where unintentional take reasonably attributable to agency action is having, or is likely to have, a measurable negative effect on migratory bird populations. Effects to migratory birds were considered for this project and are documented in this report. There is a determination of “no take” under the Migratory Bird Treaty Act for either action alternative.

Important Bird Areas and Overwintering Areas:

The nearest Important Bird Area to the Chino Small Allotment is located approximately 15 miles away in the Upper Verde IBA; therefore no IBAs are affected by the implementation of the Action Alternatives or their associated activities. Many overwintering areas are large wetlands; none of this habitat is present in or near the analysis area. Since significant concentrations of birds are not known to occur here nor do unique or a high diversity of birds winter here, there will be no effects to important overwintering areas by implementing either of the proposed actions under Alternative 1 or 2.

Bald & Golden Eagle Protection Act of 1942:

The Forest Service is required to address the effects of agency actions and plans on eagles protected under this law. Effects to eagles were considered for this project and are documented in the specialist report. There is a determination of “no take” for either alternative 1 or 2.

Cumulative Effects

The cumulative effects area is the 6th level subwatersheds that contain the allotments. Management activities, inherent properties, aquatic conditions, and natural disturbances affect wildlife, vegetation, soils, riparian, water quantity/quality and ultimately watershed condition. Water quality data within each identified watershed coupled with the current conditions were used as a barometer to evaluate the cumulative effects of this project upon soil and watershed resources when added to other past, present, and foreseeable future action(s), regardless of what entity is responsible for the action(s). Past, present and future activities that may impact wildlife habitat include the following: Livestock grazing occurs throughout the watersheds. All allotments administered by the Forest Service have grazing management plans that provide for satisfactory vegetation and soil conditions, and for water quality. Improved watershed conditions

on the PNF would provide for long-term benefits to aquatic/riparian habitats. Road conditions and proximity to stream drainages are likely impacting hydrological conditions such as channeling runoff and sediments to these stream systems. Recreational activities are primarily dispersed uses such as motorized and non-motorized road and trail use, camping, hunting, and horseback riding. These uses are having localized impacts to wildlife habitat in the analysis area. Minimal prescribed burning, vegetation treatments, or wildfire has occurred in the watersheds. Vegetation and habitat characteristics may have recovered to pre-treatment levels. The effects of the action alternatives on wildlife habitat when added to the above cumulative effects would maintain or improve suitable habitat for wildlife species and species of concern including Regional Forester sensitive species and Management Indicator Species. Since there were no adverse impacts from alternatives 1 or 2, so there would be no additive impacts.

3.7 What are the Impacts to Recreational Activities?

Existing Condition:

Recreation activity on the allotment is primarily associated with hunting, wood-gathering, and off-highway vehicle use. There are no developed campgrounds or picnic areas on the allotments, and no developed trails. 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. Some existing roads pass through private lands and there may not be an existing easement to allow the public to use some roads that cross onto private lands.

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. Adjacent to the Yolo South Allotment is the Sheridan Mountain – Smith Mesa Off-Highway Vehicle Trail System. All the trails in this area are open to motorized recreation use to wheeled vehicles 50” or less in width. Trail #56 is open to motorcycles only. Forest roads 9807C & 705A are open to all vehicles and motor vehicle use of designated roads for the purpose of dispersed camping is permitted for up to 300 feet from the centerline of the road year round. 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 the Chino Small Allotments.

Inventoried Roadless Area

Inventoried Roadless Areas (IRA's) are a group of United States Forest Service 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). The area in and around Yolo South allotment was identified as an IRA in 1977. Trails, either motorized or non-motorized are allowed in I.R.A.'s. About 61% of Yolo South allotment is part of the Sheridan Mountain Inventoried Roadless Area (IRA). The entire Sheridan Mountain IRA is about 37,599 acres and 2,113 acres of the IRA falls within the 3,458 acre Yolo South allotment. Neither action alternative proposes to build any new roads within the project area.

Direct & Indirect Effects on Recreation:

Alternatives 1 and 2 – Continuation of 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.

Alternative 3 – No Action/No Grazing Alternative

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 Chino Smalls 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 Chino Smalls 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 a review of the Prescott National Forest (PNF) heritage resource atlas and files, the following surveys and investigations have occurred within the project area and resulted in the identification and documentation of cultural resources. The heritage reports and site forms are on file in the Forest Heritage Resource Section at the PNF Supervisor's Office.

Hitt Wash

Two heritage surveys have been conducted and 6 prehistoric sites have been documented within the allotment. The surveys occurred in 2005 and 2009 for range improvements and both surveys meet the current heritage inventory standards. The 2 projects intensively examined a total of 7.7 acres. One of the heritage sites is eligible for the National Register of Historic Places (NRHP) while the other sites are unevaluated but they will be treated as eligible until a formal determination can be made.

Old Camp

Ten heritage projects have been conducted within the allotment since 1987 and meet the current heritage inventory standards. Five of the projects were surveys for range improvements, fuelwood harvesting, APS line maintenance, and road maintenance and/or construction. Three of the projects were reviews for wildlife and watershed treatments. One project involved the analysis of a grazing allotment and another project was for the assessment of damage to a site. The 10 projects intensively examined a total of 235.4 acres. In 1985, 3 projects occurred but they do not meet the current heritage standards. Ten prehistoric sites and 1 historic site have been documented within the allotment. The historic site is eligible for the NRHP while the other 10 prehistoric sites are unevaluated but they will be treated as eligible until a formal determination can be made.

Quartz Wash

Only 1 heritage survey has been conducted and no heritage sites have been documented within the allotment. The survey occurred in 1979 for fuelwood harvesting but it does not meet the current heritage inventory standards.

Yolo South

No heritage surveys have been conducted and only 1 prehistoric site has been documented within the allotment. The site has not been evaluated for the NRHP but it will be treated as eligible until a formal determination can be made.

Three of the eighteen known sites have been inspected and grazing does not appear to be adversely affecting the sites. Another site could not be relocated and one site is located in an area inaccessible to cattle. Heritage specialists will inspect the other known sites and determine if there are any adverse effects occurring from grazing. If impacts are determined, mitigation measures will be developed and implemented.

Thirteen inventories intensively surveyed a total of 243 acres for heritage resources within the allotments. When analyzing the impacts to heritage resources from cattle grazing, the Forest complies with the procedures in the First Amended 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. The document states that complete field survey of any given allotment or grouping of allotments will not be required. The level of need and extent of new field surveys or inspections for grazing impacts will be determined by the Forest Archaeologist and if new surveys are determined necessary, these surveys will be conducted prior to the signing of the NEPA decision.

Direct & Indirect Effects on Heritage Resources:

Alternative 1

Prior to the establishment of the PNF in 1908, Euro American settlers had established homesteads and ranches and were grazing livestock throughout the area. It has been documented in the PNF range files that the 4 allotments on the Chino Valley Ranger District continued grazing by livestock since 1908. Historically, all 4 allotments were once part of much larger allotments until the Forest Service divided them into smaller allotments. Before 1950, grazing occurred at much higher intensities than current levels. The Chino Valley District Ranger proposes to continue to authorize livestock grazing on the Chino Small Allotments under the following terms:

- The Hitt Wash Allotment proposes to issue a term permit for seasonal grazing with a range of cattle between 64 and 110 adult cattle (not to exceed 605 head animal head months (AUMs)).
- The Old Camp allotment proposes to issue a term permit for up to 45 head of cattle yearlong (up to 540 AUMs).
- The Quartz Wash Allotment proposes to issue a term permit for seasonal grazing with a range of cattle between 75 and 125 adult cattle (not to exceed 875 AUMs).
- Yolo South Allotment proposes to issue a term permit for seasonal grazing with a range of cattle between 40 and 60 cattle (not to exceed 240 AUMs).

This alternative is contingent upon adequate available forage and water. 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.

The following range projects are proposed to be implemented within the next 2 years and heritage surveys and reports will be completed prior to the signing of the decision. If heritage resource sites are located, project activities will avoid the sites.

Hitt Wash Allotment:

1. Water development to replace Samson Tank, T 17 N, R 5 W, Section 12
2. North/South pasture fence realignment, T 17 N, R 5 W, Section 24
3. Water development in B.Y. pasture, T 17 N, R 4 W, Sections 30 or 31

Old Camp Allotment:

1. Water development in South pasture, T 16 N, R 4 W, Section 30
2. Water development in North pasture, T 16 N, R 4 W, Section 6

Quartz Wash Allotment:

1. Water development in Quartz pasture, T 18 N, R 5 W, Section 15

Yolo South Allotment:

1. Laurel Spring development, T 15 N, R 6 W, Section 18

In the future, when additional range improvements or other ground disturbing management practices are needed, the Forest Service will complete the appropriate heritage surveys and/or reports as outlined in our Region 3 Programmatic Agreement and will be in compliance with all applicable provisions of Section 106 of the National Historic Preservation Act.

The PNF contacted six Native American Tribal Governments for their review of the grazing proposal and no significant issues or areas of special interest such as Traditional Cultural Places were identified within the allotments.

The alternative doesn't propose grazing at a higher intensity than historic levels. The Forest Service will consult with the Arizona SHPO on the effects of livestock grazing on heritage resources prior to signing the decision. The Forest Service's proposal to continue livestock management as proposed under Alternative 1 is considered to have a no adverse effect on the heritage resource sites located within the 4 allotments.

Alternative 2

This alternative is identical to Alternative 1 and its effects except for the authorization for the Old Camp Allotment that would be amended as follows:

- The Old Camp allotment proposes to issue a term permit for seasonal grazing for about 77 adult cattle (not to exceed 540 AUMs).

This alternative is contingent upon adequate available forage and water. 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.

The Forest Service's proposal to continue livestock management as proposed under Alternative 2 is considered to have a no adverse effect on the heritage resource sites located within the 4 allotments.

Cumulative Effects of Alternatives 1 and 2

Past, present, and reasonably foreseeable future actions on the 4 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 heritage resource sites.

Alternative 3 – No Action/No Grazing Alternative

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

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/>. A scoping letter dated 12/19/2014 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 resulted in the development of an additional alternative, alternative 2, to analyze changing the Old Camp Allotment to winter-seasonal grazing. Other comments received did not raise concerns that will not be addressed through project design, including resource protection measures and incorporating Best Management Practices, and following the standards and guidelines of the Prescott Forest Plan.

The Environmental Assessment for the Chino Small Grazing Allotments Management was mailed to scoping respondents and the grazing permittees, and a legal notice announcing the start of the 30-day comment period was posted in The Daily Courier newspaper on May 8, 2015. There were six responses received during the 30-day comment period. The responses were reviewed by the ID Team Leader, resource specialists, and the Deciding Official to determine if any new information was received that would have bearing on a decision between the three alternatives. No new concerns were raised by the comments.

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 – Hitt Wash, Old Camp,
Quartz Wash, Yolo South,
Williamson Valley, K Four, Yavapai
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/
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John Kava, Rangeland Management
Specialist
Loyd Barnett, Contract Hydrologist

Extended Team Members

Albert Sillas, Aquatic Biologist
Dan Garcia de la Cadena, Wildlife
Biologist
Dorothy Baxter, Recreation Planner
Elaine Zamora, Archeologist
Jim Gilsdorf, Chino Valley District
Ranger
Thomas Potter, GIS Coordinator

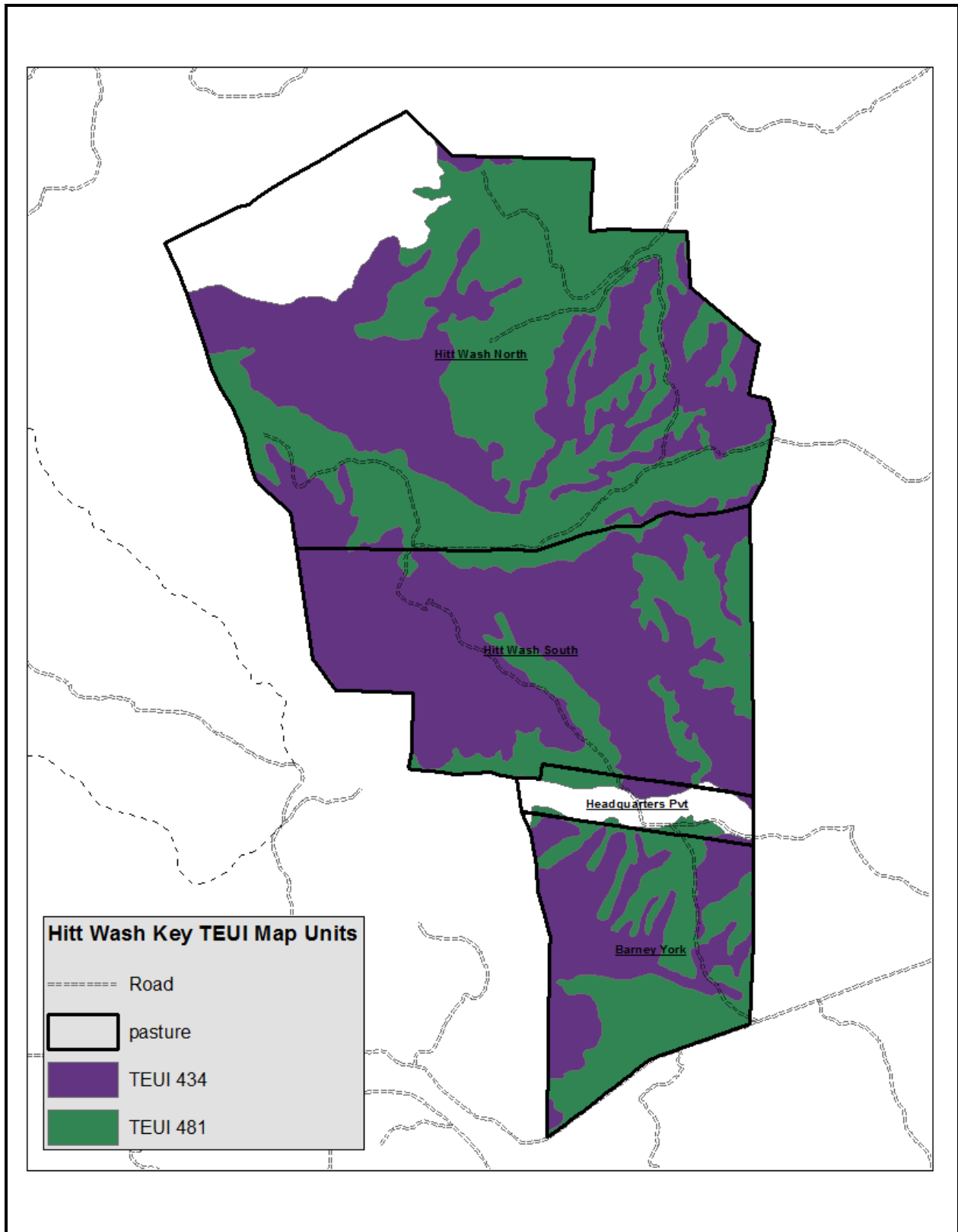
References

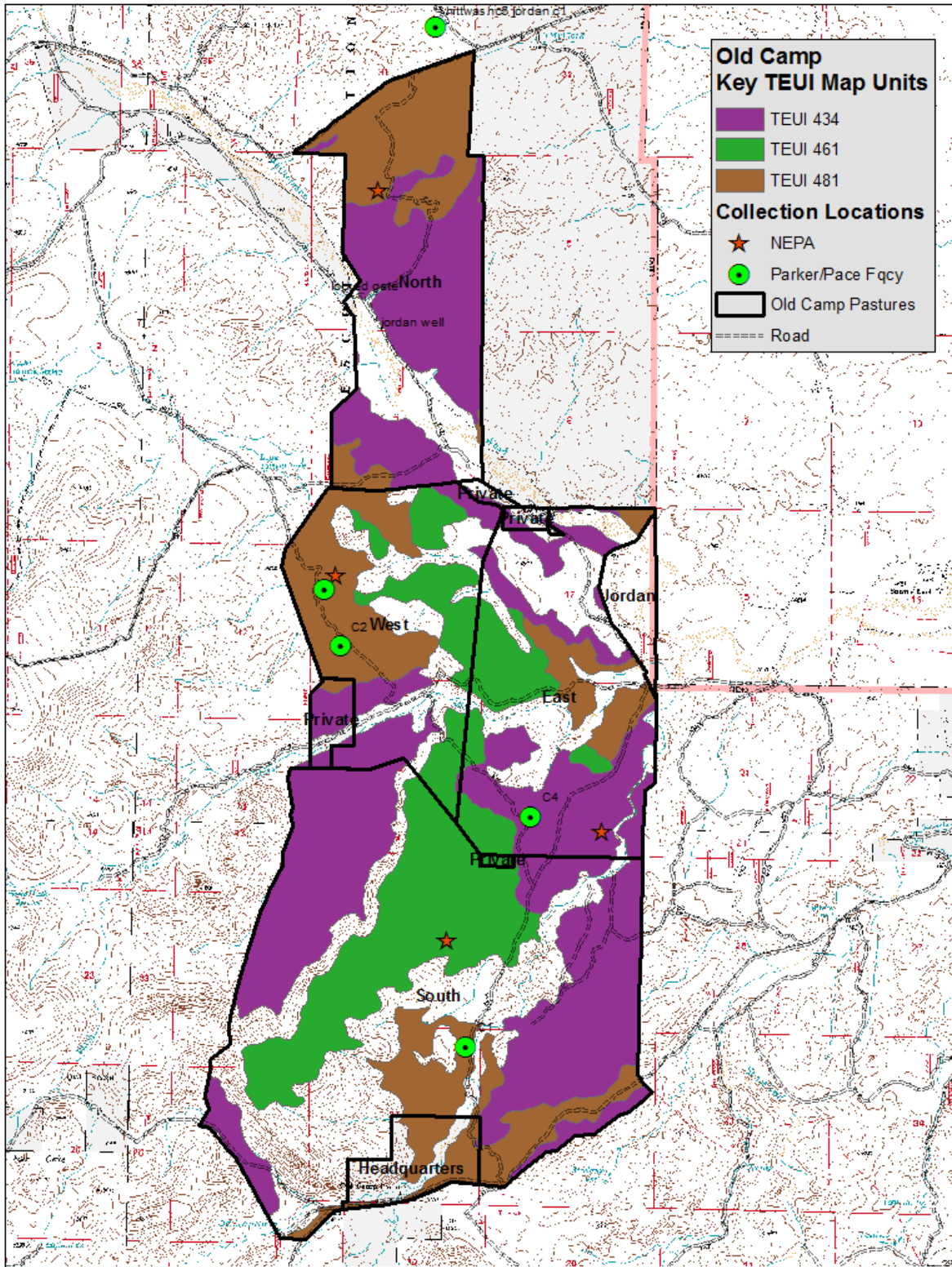
- Arizona Department of Environmental Quality (ADEQ) 2011. 2010 Status of Water Quality Arizona's Integrated 305(b) Assessment and 303(d) Listing Report. December 2011 <http://www.azdeq.gov/environ/water/assessment/assess.html>
- Arizona Game & Fish Department. Arizona's Natural Heritage Program: Heritage Data Management System (HDMS) (Web application). 2010. Available at: http://www.azgfd.gov/w_c/edits/species_concern.shtml.
- Holechek, J. L. 1988. An approach for setting the stocking rate. *Rangelands* 10:10-14
- Holechek, J.L., H. Gomez, F. Molinar, and D. Galt. 1999. Grazing Studies: What We've Learned. *Rangelands* 21(2):12-16.
- Holechek, J. L., Rex D. Pieper and Carlton H. Herbal. 2004. Range Management Principles and Practices. 5th ed. Pearson Prentice-Hall, Inc. Upper Saddle River, New Jersey 07458., from page 250 Table 8.14, General Grazing Intensity Guide for Converting Stubble Heights of Shortgrasses, Midgrasses and Tallgrass into Percent Utilization;
- Krueper, David, Bart, Jonathan, and Rich, Terrell D. 2003. Response of Vegetation and Breeding Birds to the Removal of Cattle on the San Pedro River, Arizona (USA). *Conservation Biology*. Vol. 17, No. 2. 607-615.
- Loeser, M.R.R., T.D. Sisk, and T.E. Crews. 2007. Impact of Grazing Intensity during drought in an Arizona Grassland. *Conservation Biology* 21(1):87-97.
- Moir, W. H. 2011. Thirty years of weather change and effects on a grassland in the Peloncillo Mountains, New Mexico. *Rangelands* 33(3): 50-57. <http://www.treesearch.fs.fed.us/pubs/38417>
- Molinar, F., D. Galt, and J. Holecheck. 2001. Managing for mulch. *Rangelands* 23(4): 3-7.
- Molinar, F., J. Navarro, J. Holecheck, D. Galt, and M. Thomas. 2011. Long-term vegetation trends on grazed and ungrazed Chihuahuan desert rangelands. *J. Rangeland Ecol Manage* 64:104-108.
- Robertson G., P. Boness, J. Gallegos, J. Hurja, S. Leahy, G. Miller, W.Robbie, K.Scalzone, R. Stein, and R.Steinke 2000. Terrestrial Ecosystem Survey of the Prescott National Forest. Southwest Region. Albuquerque, NM.
- Smith, L., G. Ruyle, J. Dyess, W. Meyer, S. Barker, C.B. Lane, S.M. Williams, J.L. Maynard, D. Bell, D. Stewart, B. Coulloudon. 2012. Guide to rangeland monitoring and assessment. Arizona Grazing Lands Conservation Association.
- Society for Range Management. 1998. A glossary of terms used in range management. 4th edition. Society for Range Management, Denver, CO.
- Thomas, Jack Ward. 1996. Adopting Proper Functioning Condition as a Minimum Standard for Riparian Assessments. USDA Forest Service. Memo from Chief to Regional Foresters, Regions 1-6, File codes 1330, 2520, 2620, Nov. 27, 1996.

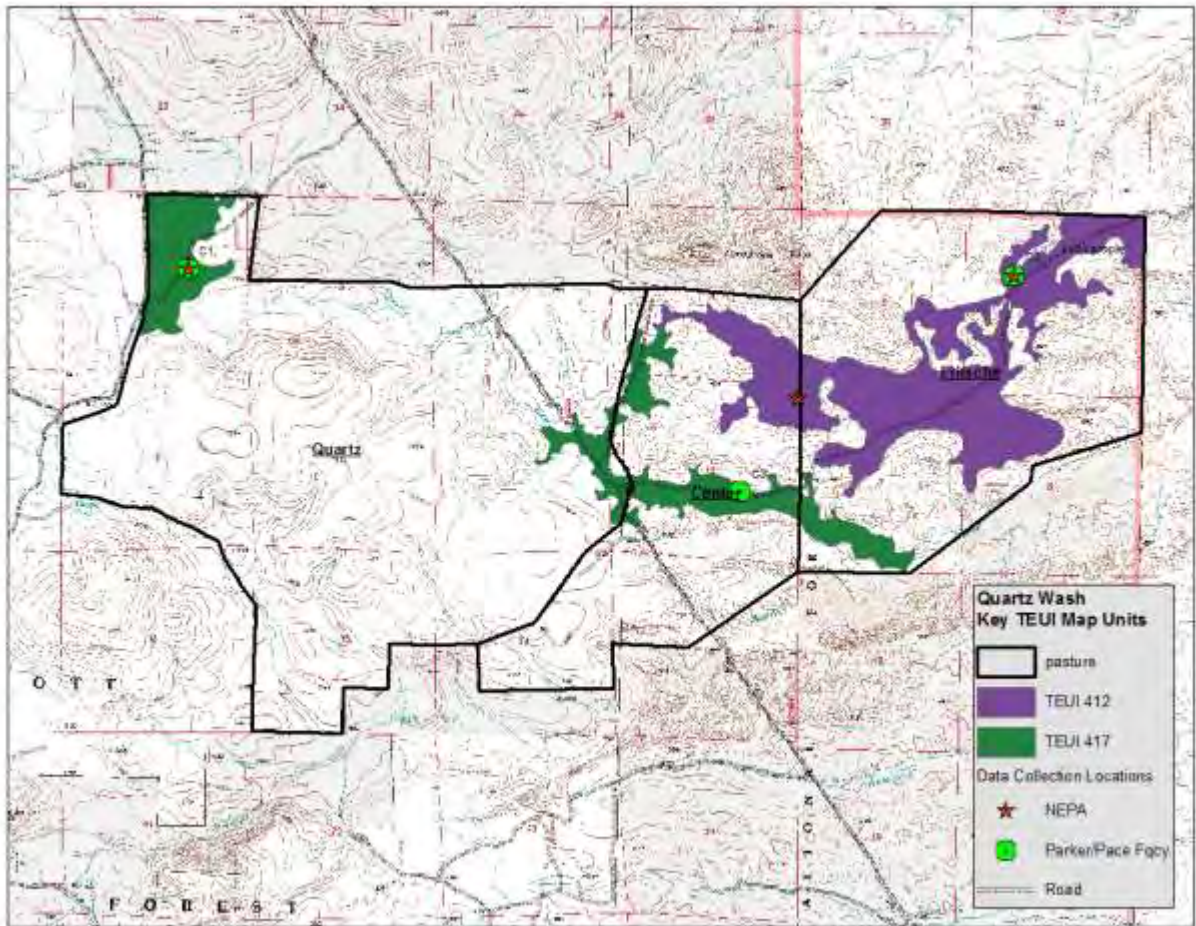
- USDA Forest Service. 2015 in press. Prescott National Forest Plan.
- U.S. Department of Agriculture, U.S. Forest Service. 2005. FSH 2209.13. Grazing Permit Administration, Ch. 90 – Rangeland Management Decision-making.
- USDA Forest Service [FS] 2011a. Forest Service Handbook 2509.22 – Soil and Water Conservation Handbook. Southwestern Region. Albuquerque, NM. http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?2509.22!r3
- USDA U.S. Forest Service [FS] 2011b. Forest Service Manual 2550 - Soil Management Manual. Washington D.C. http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsm?2500!
- USDA Forest Service Region 3. 2013. Rangeland Analysis and Management Training Guide, revised.
- USDA Forest Service [FS] 1999. Forest Service Handbook 2509.18 – Soil Management Handbook, Soil Quality Monitoring R-3 Supplement 2509.18. Southwestern Region. Albuquerque, NM. http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?2509.18!r3
- USDA, Forest Service. 2000. Terrestrial Ecosystem Survey of the Prescott National Forest.
- USDA Forest Service [FS] 2006. Draft Ecological Classification of the Prescott National Forest. Prescott National Forest. Prescott, AZ.
- USDA Forest Service. 2009. Prescott National Forest Migratory Bird Report.
- USDA Forest Service. 2010. Prescott National Forest. Forest Level Analysis of Management Indicator Species (MIS) for the Prescott National Forest, 2009 update. October 2010.
- USDA Forest Service, Southwestern Region. Regional Foresters' Sensitive Species List (Web application). 2013. Available at: <http://www.fs.fed.us/r3/resources/tes/index.shtml#content>
- USDI Bureau of Land Mgmt. 1998. A User Guide to Assessing Proper Functioning Condition and The Supporting Science for Lotic Areas. Technical Reference 1737-15 1998. Bureau of Land Management. Denver, Colorado. <ftp://ftp.blm.gov/pub/nstc/techrefs/Final%20TR%201737-15.pdf>
- USDI Bureau of Land Management 1999. Sampling Vegetation Attributes. National Applied Sciences Center. Denver, Co. Online: <http://www.ntc.blm.gov/krc/viewresource.php?courseID=296&programAreald=148>
- USDA/USDI. 1996. Utilization Studies and Residual Measurements. Interagency Technical Reference. Cooperative Extension Service. USDA Forest Service, Natural Resource Conservation Service, Grazing Land Technology Institute. USDI Bureau of Land Management. BLM/RS/ST-96/004+1730.
- USDI/BLM. 2010. Interpreting and Measuring Indicators of Rangeland Health. Technical Reference 1730-37

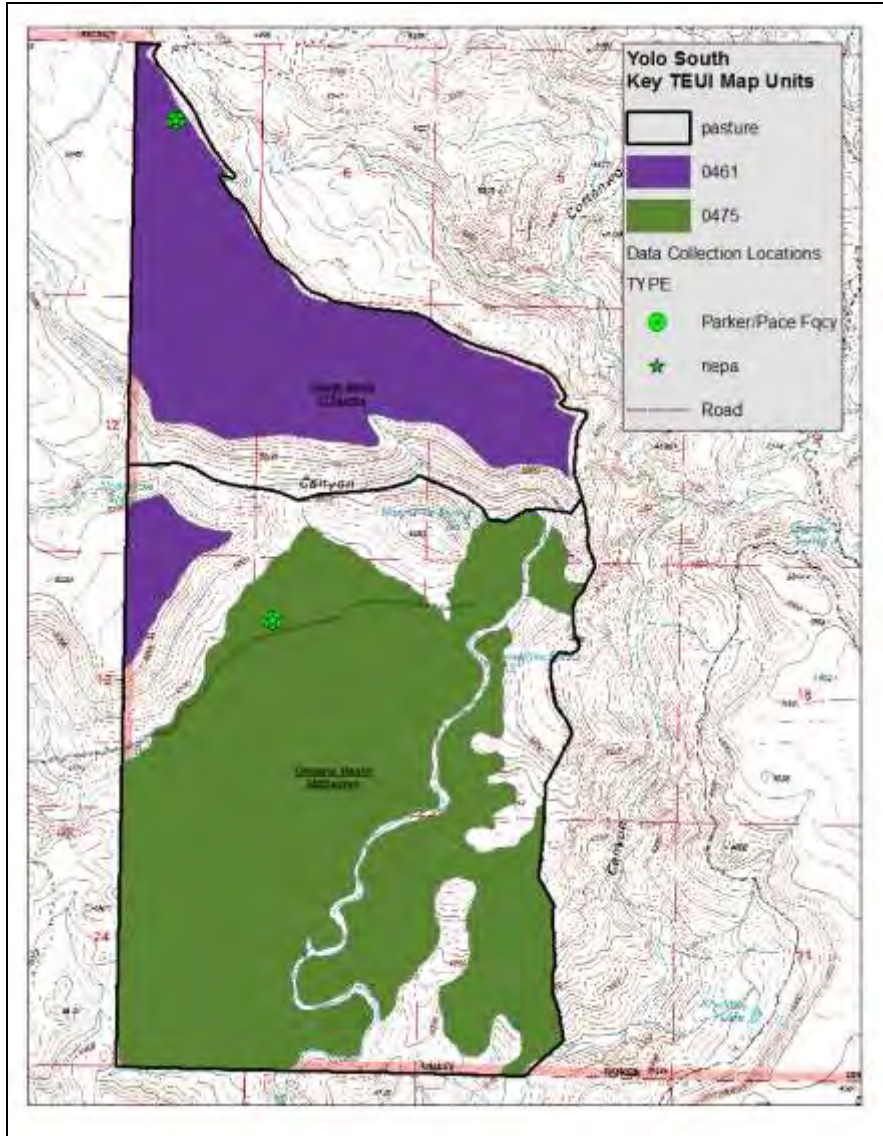
Appendix 1 – Project Area Map

Appendix 2 – Key Vegetation and Soil Map Units by Allotment

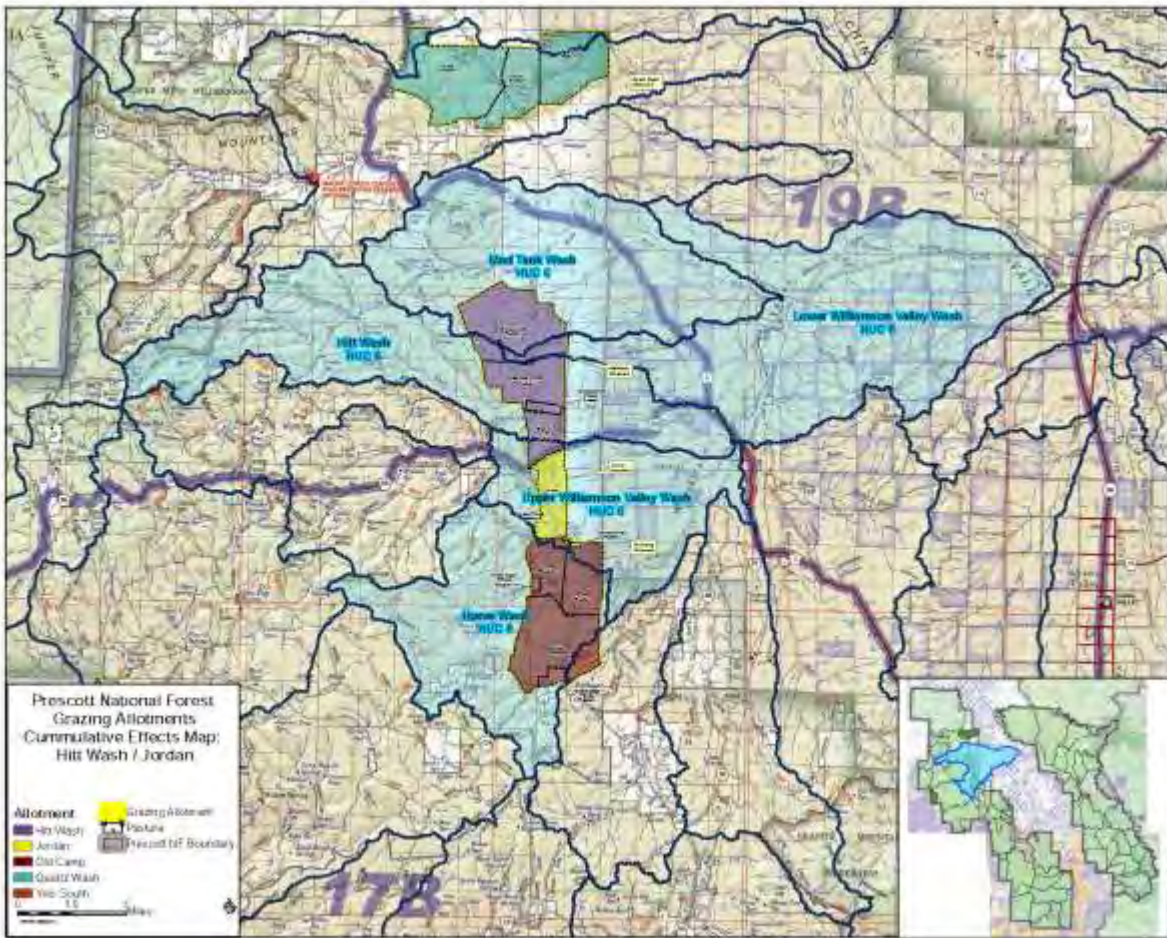


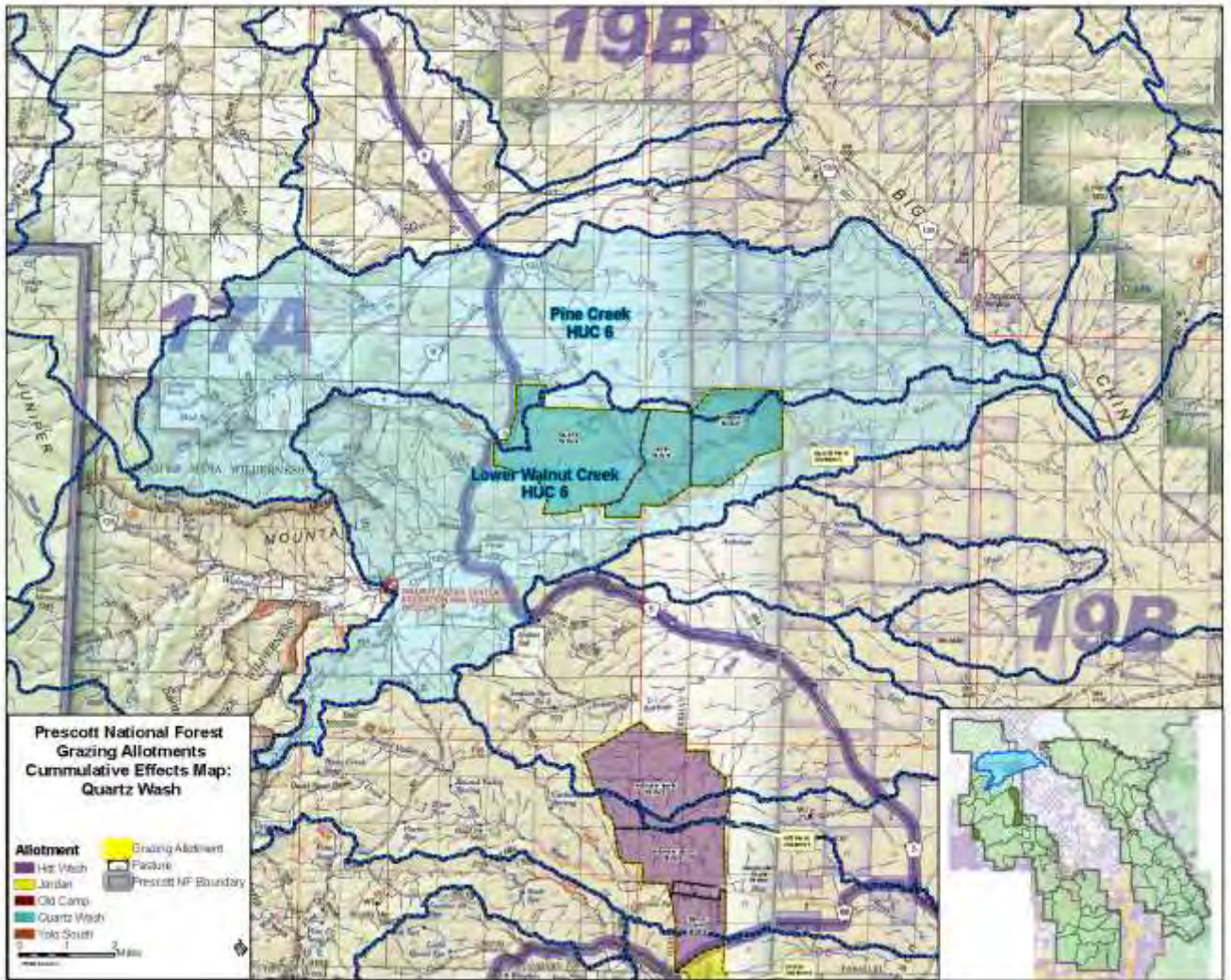


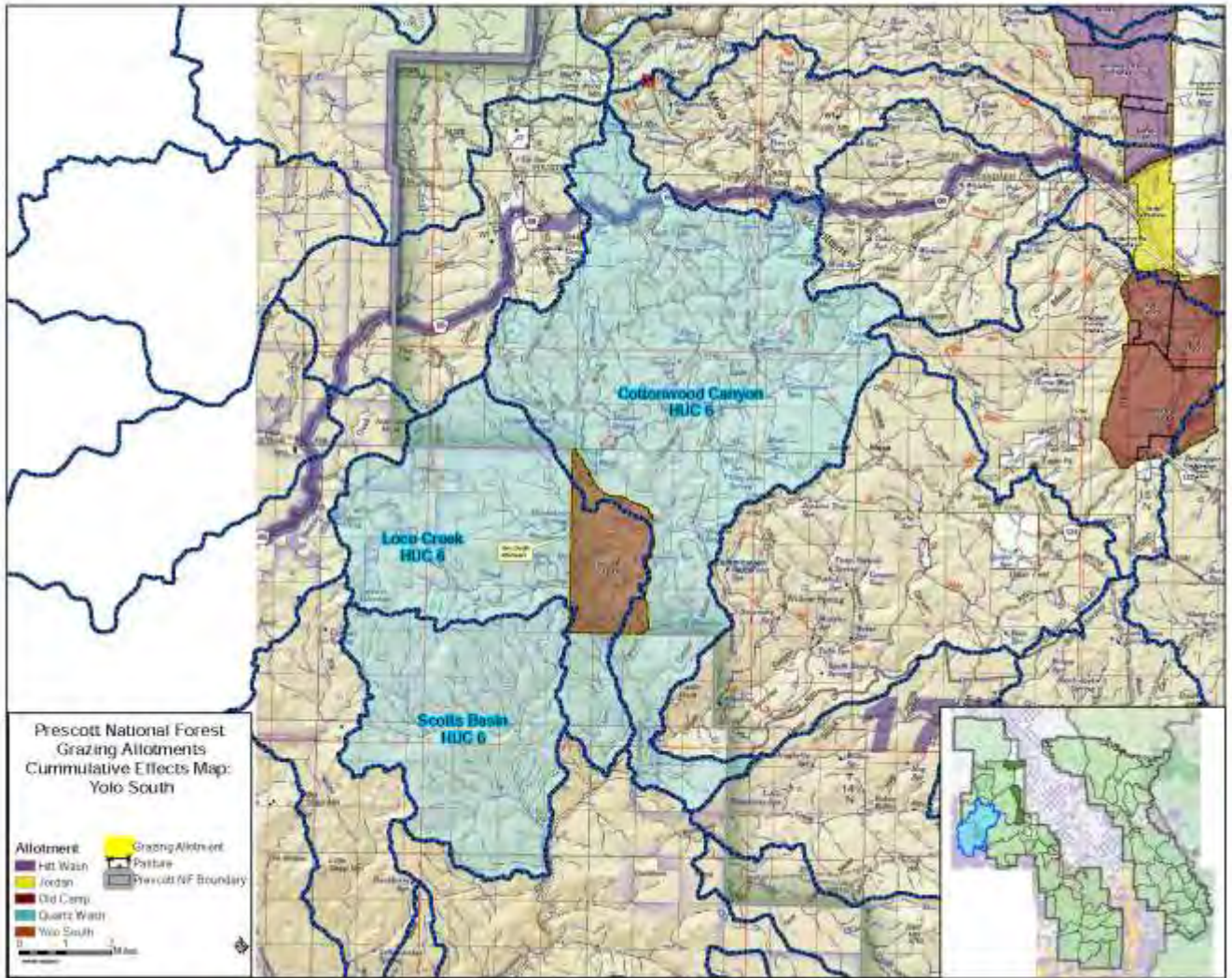




Appendix 3 - Cumulative Effects Area Maps for the 6th Code Watersheds Containing the Project Area







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 (ET) – 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 Intensity – The degree of herbage removed through grazing and trampling by livestock that may be described in terms of herbage removed during the grazing and/or growing period or as a utilization level at the end of the growing period. It is important to clearly define how intensity is being viewed and described as either relative utilization during the growing season or utilization at the end of the growing season.

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

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

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

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

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

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

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

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

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

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

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

Management Indicator Species – 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.

		and un-managed roads. Once a road started to form a gully, traffic patterns moved over and started a new road. Some of the soil erosion is very evident where new and old roads exist, and will not improve until corrective mechanical action is taken. (photos provided)	
2	3	The Jordan Pasture was not usable until the current permittee did costly, extensive improvements to the Pine Creek Well. This not only benefitted the livestock but was the only reliable water for wildlife in this pasture. The proposed water developments in this pasture would also greatly improve cattle distribution.	Comment noted.
2	4	Permittee has invested time, money, and resources in range improvements (fencing and water developments). Permittee also spends considerable time patrolling and protecting the resources on the national forest.	Cooperative investment in range developments between the Forest Service and the permittee is strongly encouraged and appreciated.
3	1	We have been observing the Prescott National Forest grazing allotment land conditions for around forty years and have not noted the movement to desired soil, water, vegetation, and wildlife conditions that have been projected for in the previous Forest General Plans. We do not see any historical information in this EA to show what the direction (be it positive or negative) is for these allotments.	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 19 of the EA states how trend is used to determine Rangeland Management Status. The current trend was considered in developing resource protection measures. For instance, on the Quartz Wash allotment, light to non-use will be implemented in TEUI 412 until vegetation trends and soil conditions improve.
3	2	It appears that the “in desired conditions” is based on a very low threshold, and when that threshold was not met it was rationalized that it was OK (TEUI 434, East Pasture pg 22; TEUI 412, Center Pasture pg. 24; TEUI 412, Fritsche Pasture pg 24; TEUI 475, Orejano Basin pg 26)	TEUI 434, East Pasture, was found to be 35% similar for the indicator grasses, mid similarity. TEUI 412 Center Pasture was rated 33% similarity for grasses and at the time of sampling it was estimated that 60% of the plants had been removed by weight, so if not grazed it would have easily been greater than 33% similarity for grasses. TEUI 412 Fritsche Pasture rated 52% similarity even with removal of 45% of grasses by weight. Whether desired vegetation condition is being met is based on a combined similarity rating (High, Mid, Low) and trend. To be attaining desired conditions for vegetation requires a Mid or higher similarity rating

			combined with a stable or upward trend.
3	3	In order to make some sense of this, the potential versus the actual percent measurements for grass, tree, and shrub cover (from which the percentage of bare would be inferred) was calculated from each of the allotment pastures information cited. Complete information for each allotment pasture was not presented in each discussion, but some had to be found in later text and in some cases in photo captions. The findings: {Bare is not in EA, but was calculated by subtracting total % cover from 100%}. Commenter provides data on canopy cover for vegetation for 12 sites. Why are so many of the figures missing?	The EA is intended to be a summary of resource conditions. The document would be very lengthy if all the data used in the analysis was provided in the EA. The complete vegetation canopy cover data and soil groundcover data are found in the specialists reports for Vegetation and Soils, respectively, and can be provided to the commenter. Commenter makes an error by using canopy cover to calculate bare ground values. The multiple layers of vegetation with overlapping canopy can result in canopy cover levels over 100% when trees, shrubs, and herbaceous plant cover is added together. Groundcover data is used to evaluate the amount of bare ground that is present, not canopy cover data. The Soil Specialist report displays what the expected level of bare ground is compared to the existing amount of bare ground for each key soil map unit.
3	4	Why are allotment pastures that have less than 55% Cover (and a lot less in grass % cover) listed as meeting Desired Vegetation Status? Why are there so many Actual grass percentages that exceed Potential by 2-5 times when the land looks so bare? Overall, the Potential Natural Vegetation Type values appear to be set way too low.	The Ecological Classification of the Prescott National Forest and the Terrestrial Ecosystem Survey of the PNF were the sources of information on potential cover of vegetation as described on page 18 of the EA. Cover for Potential Natural Vegetation Type was developed from actual sampling of TEUI soil map units on the Forest. Each TEUI has limitations on production due to soil characteristics, climate, slope, aspect, and topography. Our analysis samples current vegetation and compares it to the established potential cover percentages by soil type to determine similarity. The Desired Vegetation Status was developed by the ID Team as stated on page 18 of the EA.
3	5	Why are so many of the soil conditions rated as impaired or unsatisfactory? When viewing the allotment there is much room for improvement in increasing the amount of ground cover (reducing the amount of bare ground that has resulted in sheet erosion and gullyng – especially evident on the North Pasture of the Old Camp Allotment).	There are many elements that contribute to soil condition (Soil Management Handbook FSH 2509.18, Southwestern Region Supplement). The scope of this analysis focuses on how livestock grazing influences soil condition. Areas used to inventory soil conditions applicable to this project are based on selecting areas that are representative of livestock grazing for each pasture which are referred as key areas. Resource protection measures

			were developed to address the need to improve soil condition in some areas where grazing is thought to be having an effect.
3	6	Table 1 on page 14, under Monitoring, Alternative 3 (No Action/No Grazing) needs to have added that monitoring also needs to be performed for the duration of the Plan to determine if No Grazing results in a direction either toward or away from desired conditions.	Comment is noted. The amount of monitoring that can be conducted by the Forest is a function of staffing and annual funding that could be used to hire a seasonal workforce.
3	7	Table 1 on pg. 15, under Watershed/Soil Effects, Alt 3 states that "improvement may occur at a slightly faster rate than alternative 1." This is an unsubstantiated comment. It may not occur, it may occur slower, or it may occur quicker. We will only know if the No Grazing alternative is monitored.	The statement is based on the idea that by leaving more residual vegetative biomass under the No Grazing alternative, that there could be faster improvement in soil organic matter, nutrient cycling, and hydrologic function. The rate of soil improvement is difficult to determine. As stated in the Soil Management Handbook, FSH 2509.18 for R3, pg. 6: Soil in unsatisfactory condition may take decades or centuries to improve by resting them alone unless intensive restoration projects are implemented to recover soil function. See answer to 3-6 regarding monitoring.
3	8	Should not use range research article that is from the Flagstaff, AZ area because the conditions are not equivalent to Chino Valley, AZ. It would be better to make a comparison to enclosures that are in place on Big Bug Mesa that exclude all animal life except birds. Should also not use a range research article from the Chihuahan Desert because there is no correlation between it and the Chino Small Allotment locations.	Loeser, et al. (2007) compared grazing intensities (high and moderate), and no grazing in an area with a large interannual variation in climate (Flagstaff). While the altitude is higher it is the same climate we have on the Prescott National Forest. Considerable site-specific vegetation data collected from the 1960s to present for each allotment was evaluated to determine whether current grazing management was effective in meeting desired vegetation conditions or not. The best available science was used in preparation of the specialist reports that document effects to the various resources. We are unaware of any study exclosures on Big Bug Mesa that are of similar TEUIs of those on the Chino Small Allotments. Studies from the Chihuahan Desert are pertinent since they are studying the comparison of moderate cattle grazing and no cattle grazing in the desert southwest. Our analysis is evaluating the effects of grazing and these studies are scientific documentation supporting our analysis of effects to the vegetation from grazing.
3	9	Since only 1% of the allotment acreage has been	The level of need and extent of new

		<p>surveyed for cultural resources, it is impossible to state that any of the Alternatives will have no adverse impacts to culture resources without first knowing where those resources are located. Cows do not avoid cultural resources by walking around them.</p>	<p>field surveys or inspections for grazing impacts will be determined by the Forest Archaeologist. If new surveys are determined necessary, these surveys will be conducted prior to the signing of the NEPA decision. Complete field survey of any given allotment or grouping of allotments will not be required. These procedures comply with the First Amended 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. A no adverse effect on the cultural resources is based on the Forest Service’s proposal to continue the authorization of livestock grazing under an adaptive management system and in a manner consistent with the goals and objectives and the standards and guidelines of the PNF Land and Resource Management Plan. If cultural resources are located where new range improvements are proposed then the resources will be avoided during the implementation of the projects. The identification and assessment of cultural resources is an ongoing process within the Chino Small Allotments. If cultural surveys, inspections and/or monitoring identify that sites are at risk of being adversely affected by grazing, then protection measures will be implemented.</p>
3	10	<p>Within 2 years of issuing a new permit, range projects totaling \$108,500 will be done on the Chino Small Allotments. This would use most of the Range Betterment funding, leaving at a maximum only \$11,500 for all other range projects.</p>	<p>As stated on page 32 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 cost to the Forest Service over two years is expected to be about \$56,500 for materials, with the remainder provided by the permittee providing the labor.</p>

			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.
3	11	Please provide a source study for the statement “In areas where dense juniper stands are leading to reduced herbaceous groundcover and affecting soil condition, the elimination of grazing will not improve soil condition appreciably”. Mechanical juniper treatment restoration recommendations should be stated for alternatives 1 and 2 as well as alternative 3.	It is well documented that once dense juniper stands are established, understory density and diversity is hampered. Climate zones of the Prescott National Forest favor the prevalence of warm season grasses. Due to photosynthesis properties (C4 plants) they favor full solar energy. Once Juniper stands have been established the niche for C4 plants are lost because of the lack of prevalent solar energy. In addition, soil water is also a limiting factor in areas of the PNF. Juniper species intercept high levels of rain fall, which is lost to evaporation. This occurs during critical graminoid growing periods. Juniper species are known to have extensive shallow roots that have a competitive advantage for extracting soil water from surface and subsurface soils resulting in a competitive advantage over graminoid species.
3	12	We would like to add that over many years we have observed that the upper reaches of Hitt Wash (outside the boundary of the Chino Small Allotments) is intermittent in flow.	Comment is noted.
3	13	From Direct and Indirect Effects on Water Resources and Watersheds (Pg 52-53) it appears that a little over 3 af/yr are planned to be produced from new water sources. Although this is a relatively small amount, one must think that with hotter and drier conditions, and an increasing area population, resulting in a draining of our aquifers; water will have a more valuable human use rather than using it to produce beef.	Comment of opinion is noted and considered by the Deciding Official.
3	14	Cumulative effects for soils and watersheds on page 55 shows only 4 lines of text given to effects of livestock grazing, the least of all the listed possibilities.	The EA contains only a summary of information contained within the full specialist reports. The cumulative effects area being discussed on page 55 of the EA is the 6 th code sub-watersheds that contain the allotments. There are lands of different ownership within the subwatersheds, and grazing is likely to have occurred to varying levels in each jurisdiction. It is outside the scope of this analysis to determine grazing effects on lands of other

			ownerships. All allotments managed by the PNF operate under an approved Allotment Management Plans or annual operating instructions and are managed to sustain or improve soils and watersheds and follow Best Management Practices. When this project is added to the managed grazing already occurring on the Forest, it does not result in cumulative effects.
3	15	We would like to see an Alternative 4 that includes most of Alternative 1 but removes Old Camp Allotment from grazing during the duration of the management plan to study what the effects of total livestock removal would be by conducting extensive monitoring of vegetation and soil condition. Separate plots should be established as demonstration areas for established and experimental restoration projects.	Statement of opinion is noted. There will be separate decisions issued for each of the four allotments in the analysis. The Deciding Official can choose Alternative 3 for the Old Camp Allotment without creating a new alternative. Monitoring is addressed in 3-6.
3	16	The Yavapai Group recommends that Alternative 3 be chosen as the preferred alternative to be implemented.	Statement of support for Alternative 3 is noted.
4	1	Submitting comments regarding the Old Camp/Jordan Allotment. Has noticed that over the past 30 years there has been unsightly and unhealthy encroachment of cedar and juniper trees. The area used to be more open and is now covered with cedar and juniper thickets. The extremely thick juniper tree cover does not allow vital elements of water and sunshine to let as much grass grow as I used to see. The deeded land adjacent to the Forest produces more forage and has open area to enjoy because it has had cedar eradication.	Comment noted. This project does not propose any vegetation treatments or prescribed burning.
4	2	The trees show poor health on the Forest. Good management includes healthy, controlled burns to thin out trees and brush, to get nitrogen back into the soil as well as cleared land to enjoy. It seems that fire suppression has been the option of the forest service authorities lately and not the best choice, in my opinion.	Comment noted. This project does not propose any vegetation treatments or prescribed burning.
4	3	I have noticed on the Old Camp Allotment that there are large areas where there was an attempt at one time to burn and eradicate some of the trees. However, what I see are many scarred areas, where they apparently chained or pulled trees into huge piles and burned extremely hot piles thus sterilizing the ground for any growth of forage.	Comment noted. This project does not propose any vegetation treatments or pile burning.
4	4	I would whole heartedly support the decisions of the permit holders on these properties to be the best judge of choosing the Alternatives. Although I cannot speak for all the other Allotments mentioned, I am familiar with the Old Camp/Jordan Allotment and I would say that Alternative #2 or #3 should NOT even be considered as viable options. Alternative 3 is not at all a good idea as livestock and wildlife help sustain the good health of the land. If the ranchers are not allowed to run any cattle, then the wildlife will suffer for lack of salt and maintained water sources. At least Alternative 1 is proactive with trying to fix some of the soil erosion problems, road closure issues to stop further gullies	Statement of support for Alternative 1 is noted.

		from forming, hopefully eradicating a very large number of encroaching trees and better water distribution for the livestock and wildlife. Thank you for considering my opinions on choosing Alternative #1 for the Old Camp/Jordan Allotment.	
5	1	I was pleased to discover, however, that you've included a new alternative, Alternative 2, which includes a proposal for seasonal grazing on this allotment. Still, you aren't proposing to implement this option and your explanations are confusing. The project's environmental assessment (EA) admits that much of the allotment's vegetation would benefit from a season, cool-season-only, grazing system. But it also says that "grazing during the wetter winter months could lead to more soil compaction by hoof action" in the allotment's North Pasture. In your proposed action this would be avoided by prohibiting cattle from grazing this pasture when soils are typically wet. But why couldn't grazing in this pasture also be deferred when its soils are wet under a seasonal grazing system? I suspect the real reason you are still proposing to implement a yearlong grazing system is that the allotment's permittee doesn't want to have to use a seasonal grazing system.	Climate precipitation systems on the PNF are bimodal. This consequently impacts soil moisture dynamics. During winter precipitation periods, precipitation is of low intensity and snow fall provides gradual water inputs into the soils. Plant transpiration is also minimal during the winter. This results in full saturation of the soil profile and enables saturation of the subsoil. These uniform soil saturation characteristics makes them vulnerable to damage from any form of load bearing stresses. Subsequently, summer storms are of high intensity and soil infiltration rates, inherently, are unable to allow full infiltration. In addition, plant evapotranspiration during the summer period is high resulting in the loss of soil moisture. Hence the subsoil horizons are not normally recharged from summer precipitation events. The Forest Service will consider different grazing systems and how these will affect the ranching operation as a whole. The grazing system chosen will have to allow for attaining the desired conditions and be in compliance with Forest Plan guidance.
5	2	My other primary criticism of your initial proposals was the lack of focus on protecting the riparian habitat found along Walnut Creek in the Center Pasture of the Quartz Wash Allotment. Your proposed action says on page 8 of the EA that fencing of Walnut Creek would only occur if monitoring shows that it is needed. But this riparian area is already degraded from cattle grazing. The EA says that it was assessed as Functional-At-Risk with a downward trend and your photo of it on page 48 shows its poor condition. In response to this ongoing problem, you propose on page 53 that warm season vegetation will be rested every year. But this allotment already has a cool-season-only grazing system and this riparian area is still getting damaged by cattle.	The overuse of Walnut Creek by livestock was a management issue that has been identified and measures implemented to prevent this from future occurrence. There has been plenty of documentation of the resiliency of riparian areas once unmanaged grazing is removed or managed properly. We fully expect this riparian area to become fully functional under the proposed action and proper management. If there is future overuse and degradation of Walnut Creek this riparian area will be excluded from grazing by fencing.
5	3	The only other measure I found in your proposal to address this problem was on page 29 of the EA where you say that, "More reliable upland water will also alleviate cattle watering in riparian areas, especially in Center Pasture containing Walnut Creek." While this is an oft-repeated claim, I'm not aware of any evidence that it's worked in the American Southwest. Can you	Access to the small portion of Walnut Creek within the boundaries of the Quartz Wash allotment is steep and difficult to access for domestic cattle. If adequate water is available at another easier accessible source, ie. Quartz Well within this pasture and there is

		<p>provide any? Some cattle might be willing to climb a hot, sunny hill to take advantage of a new watering trough on the uplands, but many will stay down in the riparian area. And the objective isn't to simply have fewer cattle in the riparian area, it's to have none, or so very few that the habitat can heal.</p>	<p>adequate forage elsewhere they will not be forced to access this creek for water.</p> <p>Davis (1982) in Arizona, found that a four-pasture rest-rotation system was a cost-effective and successful method for rehabilitation of the riparian resource when each pasture received spring- summer rest for 2 years out of 3. On 2 grazing allotments, cottonwood and willows had a mean increase from 78 plants/ ha to 2,616 plants/ha, 2 years after implementation of the system. Perry (2005) provides alternatives to fencing riparian areas. Among the suggestions is providing off creek water sources that are easily accessible, salt away from riparian areas, and herding.</p> <p>Citations: Davis, J. W. 1982. Livestock vs. riparian habitat management – there are solutions. P. 175-184. In: Wildlife-Livestock Relationships Symposium: Proc. 10. Univ. of Idaho Forest, Wildlife and Range Exp. Sta. Moscow. Perry, Chuck, Rangelands Vol. 27, No. 4 (Aug., 2005), pp. 37-39</p>
5	4	<p>It's obvious what the real reason is that you are proposing to construct expensive new upland livestock watering sites. It's found on page 31 of the EA where you state that, "The new water sources will provide for dispersion of the grazing herd into under-utilized areas." In other words, the real reason is the new waters will allow these allotments to support more cattle. And that seems to be the primary objective of this project too. I suggest that if you are going to spend taxpayer monies that at least some of it should go towards something that's in the public's interest – like riparian habitat protection.</p>	<p>Providing new water sources that are actually on the federal lands protects the existing riparian areas by improving distribution of livestock, reducing their reliance on a few private owned water sources (on the Old Camp Allotment specifically), adds additional water for wildlife, and is a water source controlled by the Forest Service. In essence we are protecting and managing riparian habitat by developing new water sources to reduce livestock impact on natural riparian resources.</p>
6	1	<p>You state on page 3, "There have not been AMPs in place that were in compliance with the National Environmental Policy Act." Does this mean there were AMPs, but they weren't in compliance with NEPA for some unstated reason, or does this mean there were not AMPs at all? Please send me copies of the most current AMPs.</p>	<p>The final EA will be corrected to show that Old Camp Allotment does have a prior AMP that went through the NEPA process with a decision in 1996. That analysis did not consider the addition of the Jordan Pasture that increases the allotment acreage by about 23%. Hitt Wash has an AMP from 1966 that predated the passing of NEPA. The Yolo South has an AMP dated from 1978 where no NEPA documentation could be found. The Quartz Wash Allotment has no AMP.</p>
6	2	<p>On Hitt Wash, it appears you intend to almost double the number of permitted livestock (from 64 to 110)</p>	<p>Prior to 2004 this allotment was authorized 215 head for 2.5 months or</p>

		while decreasing the land area grazed, because of reductions in grazing use in the BY pasture.	537.5 AUM. Under Alternative 1, the maximum stocking would be 605 AUMs which is a 13% increase from the 2004 level. There is no indication in the files as to the reason the stocking was reduced. Through monitoring and utilization measurements and assessment of forage production we have determined the current stocking rate is low. We have adjusted this to enable more livestock to be added in years where forage is plentiful, yet within forage use levels. The BY pasture is currently used only for gathering and holding a few head. With proper water development this pasture is scheduled to be used in a rotation with the other pastures. We have identified erosion treatment for gullies where they are occurring, however do not associate the erosion being caused by grazing.
6	3	You also intend to increase the permitted use of Quartz Wash, from 75 to 125 head. This despite acknowledged soil erosion problems in both allotments	The Quartz Wash Allotment is currently a 75 head yearlong permit or 900 AUM. Changing the permit to 75 to 125 head for 7 months is a reduction from current permitted levels. At the midpoint of this range, 100 cattle for 7 months, is a 22% reduction from the current permitted number. Soil erosion is limited to certain TEUIs that occur along the primary travel route through the allotment, and may not be associated with grazing.
6	4	You seem to be of the opinion that your new management plan is going to be so successful that there is no need to wait before adding more livestock to these areas that are currently overgrazed. We believe you should consider the best practices approach of solving the ongoing erosion problems, which are also ongoing Forest Plan violations, before adding more livestock, not after.	The description of the grazing alternatives in the EA on pages 5-11 states that under adaptive management, less cattle than the upper limit on the term grazing permit may be authorized in a given year depending on resource conditions and forage availability. Annual stocking will be based on existing resource conditions. There is no scenario described in the EA where cattle will be added without consideration of current resource conditions. Resource protection measures are incorporated to improve areas that are departed from desired conditions, and the alternatives were developed to be in compliance of the Forest Plan as evaluated by resource professionals in vegetation, soils, watersheds, and wildlife.
6	5	We note that you do not say that the areas of "severe" and "significant" compaction will not receive rest, only	We do not say that areas of compaction will not receive rest. We say they will

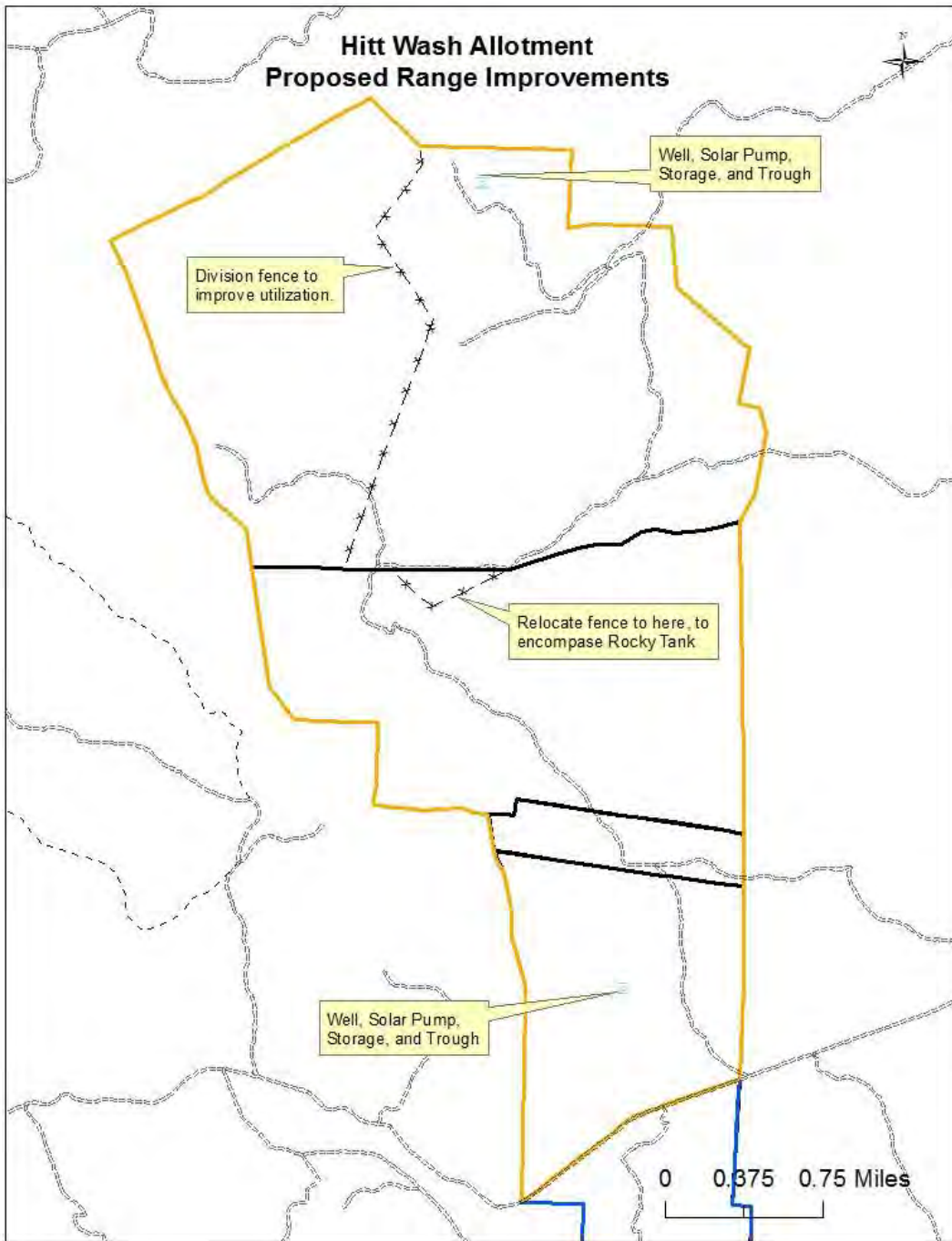
		a theoretical and unproven and unquantified diminishment of use. But is this enough to arrest a "severe" or "significant" problem? You do not say, nor do you provide assurances that you will monitor the problem and take steps to reverse it should your hopes prove unfounded and unrealized	receive rest and deferment as described under the grazing alternatives on pages 5-11 of the EA. The resource protection measures for soils are expected to allow for improvement in soil condition. The EA on pages 10-11 describe monitoring, and adaptive management is described on page 6 of the EA. Changes in soil condition may take decades or centuries to be realized even under a scenario of complete rest (Forest Service Handbook FSH 2509.18, Soil Management Handbook, R3 Supplement).
6	6	Why were steps to resolve these problems not taken a long time ago?	There have been reductions in stocking levels on these allotments through the years in response to observed resource issues. The Vegetation and Range Management Specialist Reports document substantial reductions in stocking that have occurred since grazing was regulated by the Forest Service beginning in the early 1900s.
6	7	The problem is compounded by the fact that you aren't even promising to construct the water developments that you allege will solve the erosion problems, and you admit the funding for them may not be available. Am I to presume then that you will increase livestock numbers anyway?	See answer to 3-10 regarding funding of range developments. Livestock numbers are adjusted each year and documented in the Allotment Operating Instruction dependent of previous years' forage production.
6	8	You state that the science shows that if four to six inches of stubble height is preserved, and where no more than 20 percent use by weight on woody species in riparian areas is utilized, riparian areas will not suffer. EA at 7. But the Quartz Wash Annual Operating Instructions have included this measure for more than a decade, and Walnut Creek is admittedly suffering from overgrazing.	The Quartz Wash AOI only discusses upland utilization of herbaceous plants (percent use). The AOI does state that riparian shrub use should not exceed 20 percent by weight. Quartz Wash has lacked proper management and a decline in the water improvement in Center Pasture. This has been addressed and will be closely monitored going forward. Center and Fritsche pastures were rested during the 2015 grazing year and will be assessed prior to authorizing grazing in 2016.
6	9	If you agree with the science that you have cited, isn't Walnut Creek's current condition proof that riparian use has been exceeded, probably for many years? And yet this is not enough for you to take action: rather, you say, "In the event that monitoring of the riparian vegetation at Walnut Creek shows that allowable use levels are often exceeded, and riparian vegetation is not able to meet desired condition, then a fence would be constructed to exclude cattle from Walnut Creek." EA at 8.	Management-induced cause and effect relationships for riparian areas can be difficult to assess without also taking into account the occurrences of scouring floods. The IDT recognized a need for improved management of Walnut Creek, and proposed resource protection measures as stated by the commenter that are expected to allow for attainment of desired condition in the riparian area.
6	10	It seems to me you are much more eager to increase numbers than you are to address the resource problems in this allotment, which you appear to be deferring even	See answer to 6-4 regarding increases in stocking. The EA discloses the need for changes in management on pages 4-

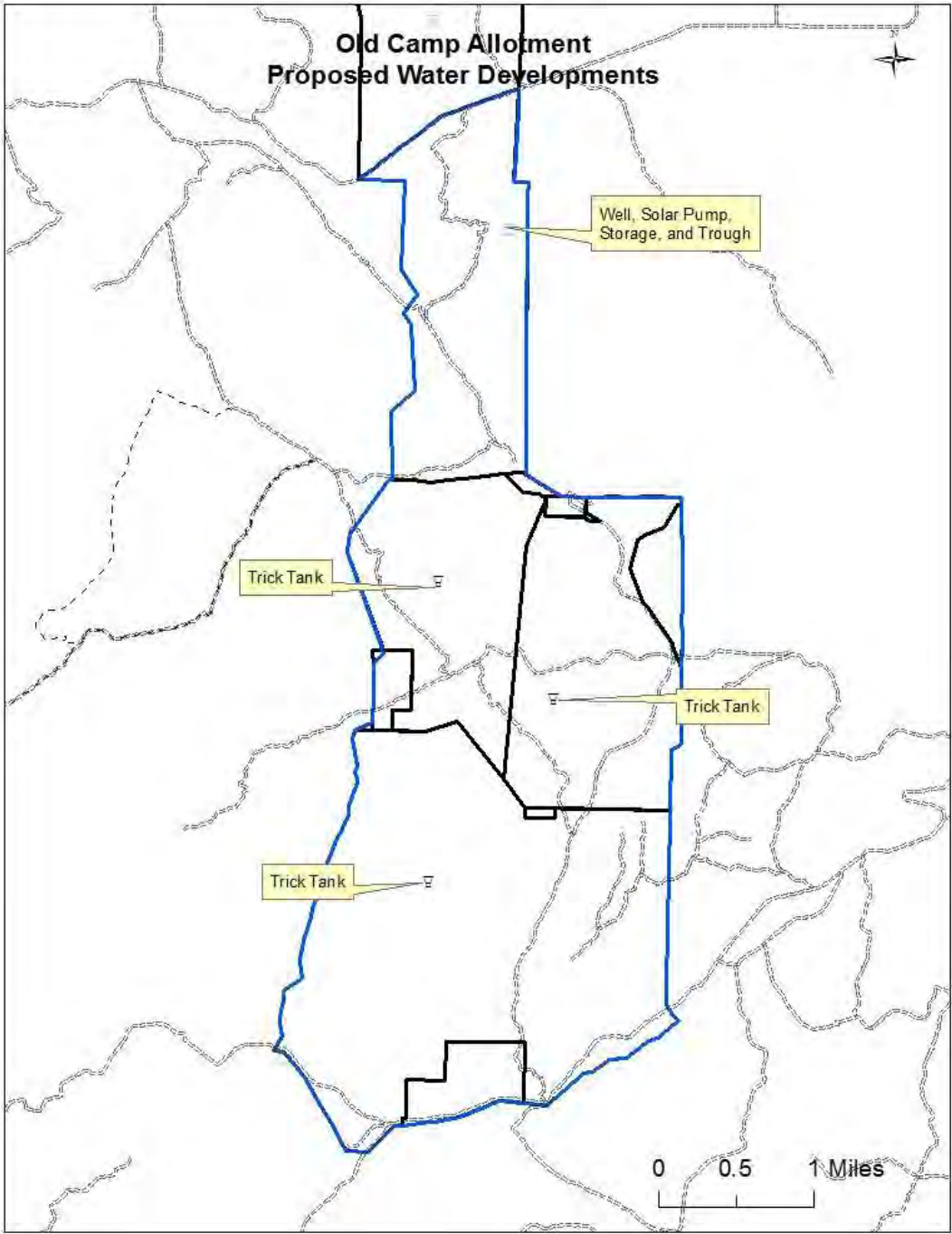
		now that you are finally preparing an EA. What is so hard about admitting there is a problem and using this process to fix it?	5, and Lists resource protection measures on pages 6-9 that area expected to improve areas departing from desired conditions.
6	11	Has utilization <i>ever</i> , even <i>one single time</i> , been "measured" -- which is to say, not eyeballed -- on any of these allotments other than during the very rare and thorough effectiveness monitoring? Has stubble height or riparian use <i>ever</i> , <i>one single time</i> , been "measured" on any of these allotments?	Historically the Range Staff on the Prescott National Forest have gathered together once a year to "train" their eye, and discuss proper use of the Rangeland Health Assessment checklist. This checklist has been used to document ground cover, canopy cover, utilization, and other indicators of range health. In 2015 Prescott National Forest range staff, including 2 seasonal employees, attended a University of Arizona workshop on measuring utilization of grasses using the Height-Weight Method. After annual training ocular utilization estimates are best way to maximize time while in the field. Quantitative measurements of utilization using the Height-Weight Method are also employed. Hitt Wash files record 6 instances of utilization monitoring from 2000-2014, and stocking reflects reductions in stocking in drought years. Quartz Wash files record 5 instances of utilization monitoring from 1996-2014, stocking reflects reductions and total removal due to over utilization during drought. Yolo South files record 2 instances of utilization monitoring from 2000-2014, nine of these years there was no authorization of grazing. Old Camp recorded 6 instances of utilization monitoring from 1996-2014, stocking reductions were made following over use.
6	12	It seems you are, first, reducing maximum utilization on these allotments from 50 to 45 percent, which is (a) not a reduction that is calculable by the "ocular" system, (b) rarely measured anyway, (c) if noted, noted by the permittee, who has no incentive to self-report over-utilization, (d) not going to result in changes even if it is noted and recorded by the Forest Service because you have expressly stated that it would have to happen "over years" and even then would be considered with many other factors, like weather. And I cannot help but note that nowhere do you even say this monitoring will occur yearly!	Adjusting maximum utilization to 45 percent is based on the conclusions from range studies as the level to maintain or improve range conditions over time. This level of utilization allows key forage species to maintain plant health. See answer to 6-11 regarding ocular utilization measurements and other types of methods employed. Adaptive Management is designed to provide sufficient flexibility to allow management to address changes in

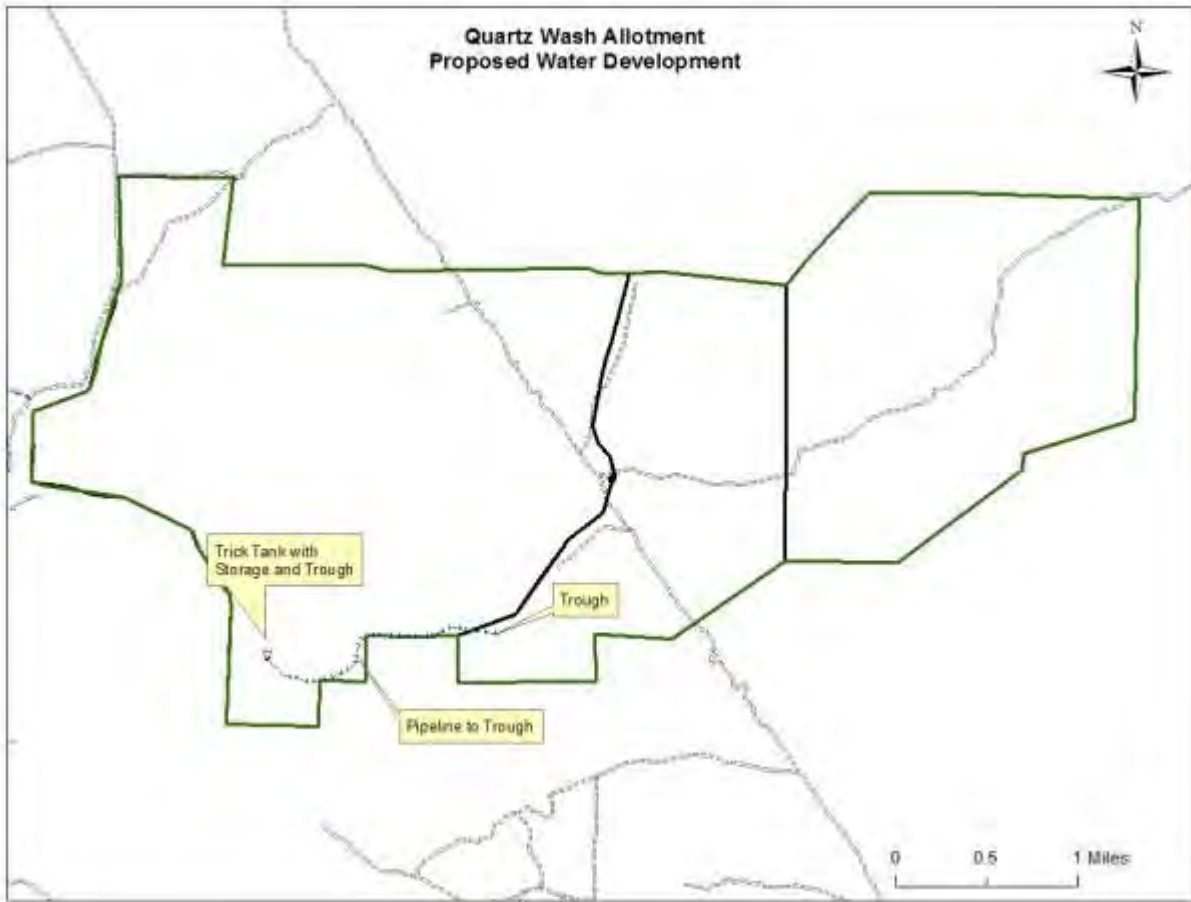
			<p>climatic conditions, seasonal fluctuations in forage production and other dynamic influences on the ecosystem in order to effectively make progress toward or maintain desired conditions of the rangeland and other resources.</p> <p>A review of these allotments show a large variation of stocking from year to year based on monitoring and climatic conditions.</p> <p>Hitt Wash varied from 20 head to 85 head, or an average of 51 head/5.5 months a year.</p> <p>Quartz Wash had two years nonuse for resource protection from 2000-2014. In 2015 only one of three pastures was authorize for use due to overuse in previous year.</p> <p>Old Camp varied from 15 to 45 head from 2000-2014 with removal of all livestock in 2004. Under the current configuration of pastures this allotment has been stocked at an average of 33 head yearlong since 2010.</p> <p>Yolo South Has stocked at 62 head for 4 months for 7 of the past 14 years.</p>
6	13	<p>Second, you are planning an ambitious water development scheme, to the tune of \$126,000.00, which is hardly described, and nowhere justified. You say the permittees will "share" this cost, but you do not say how much of the cost they will share. What benefit does the American public get from these wells and pipelines and this transformation of natural springs into livestock watering holes? Why should they be pleased to be purchasing these things? Wouldn't the average person prefer that you analyze an alternative that would accomplish the same objectives by reducing use, and thus save the money for some worthy purpose?</p>	<p>See answer to 3-10 concerning cost share for range improvements. A cost-benefit analysis was prepared that considered the economic benefits and costs of implementing the alternatives for each allotment including no grazing. Water sources are used by wildlife as well as livestock. The commenter asks the Agency to make assumptions on public perceptions. This proposal was presented to the public and comments were solicited.</p>
6	14	<p>I defy any honest person to say that water coming out of the ground and the plants and animals it serves is no different from your average "developed" spring which now saturates Arizona's public lands.</p>	<p>Alternative 1 includes the development of Laurel Spring on the Yolo South Allotment and that is the only spring development being proposed. There is no claim that developed springs are the same as undeveloped. As described on page 10 of the EA and page 54, the fencing of Laurel Spring is being proposed to eliminate disturbance of the ground in the area of the spring and to promote herbaceous and woody plant establishment. A water trough outside the riparian area would provide water for livestock without allowing access to the riparian vegetation.</p>
6	15	<p>If you intend to keep grazing areas experiencing</p>	<p>The EA on pages 40-43 describes</p>

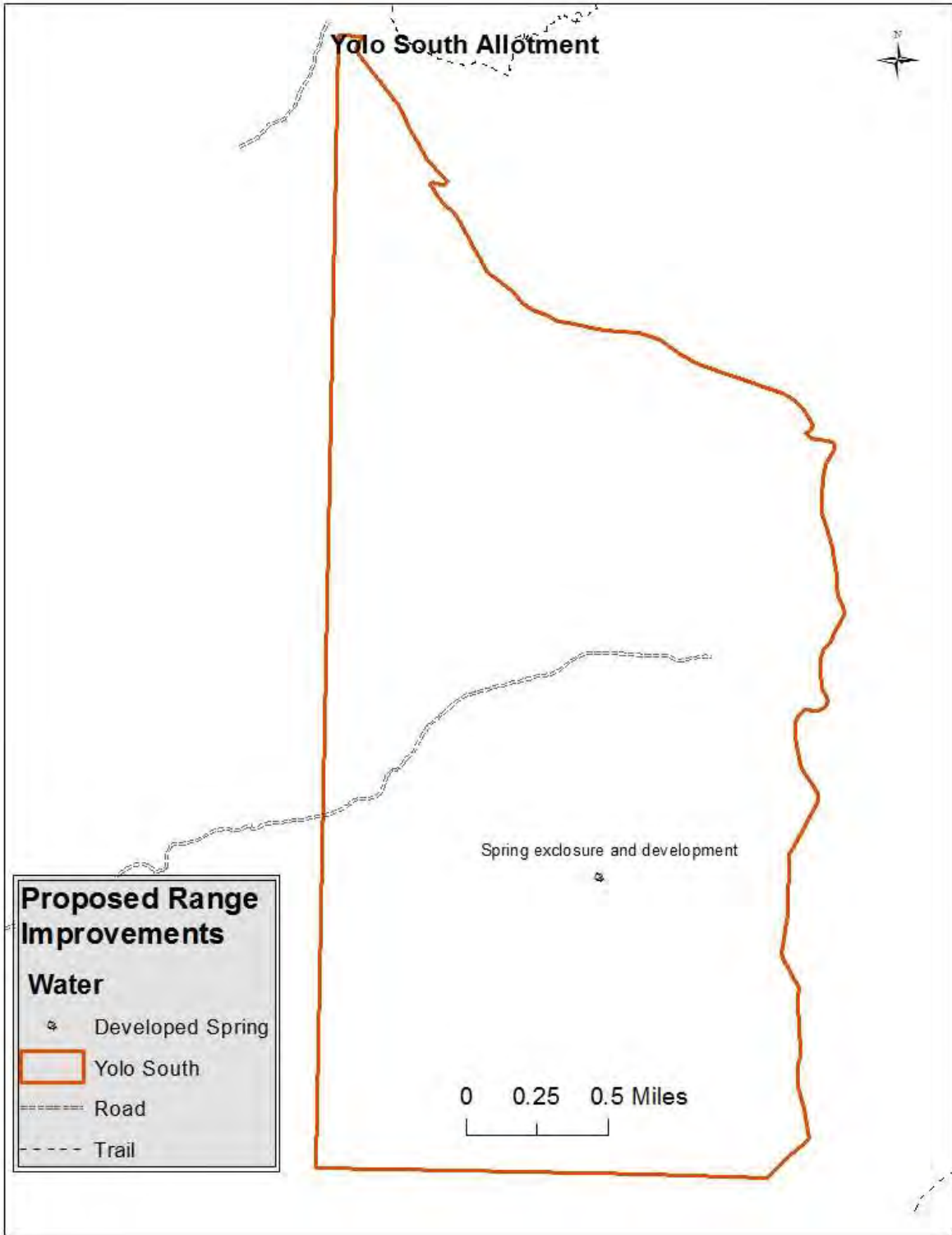
		"severe" and "significant" erosion without doing something that will actually lead to those areas' improvement, you need to write an EIS. You also need to evaluate an alternative that will actually address, rather than forestall addressing, the problems	resource concerns related to soil and the design features being proposed that will allow for attainment of desired conditions for soil, or improvement towards desired conditions. Also see answer to 6-5. The deciding official will determine whether an EIS needs to be prepared as stated on page 12 of the EA.
6	16	For example, you say that "Grazing intensity is measured by determining the level of utilization on forage plants." EA at 6. But grazing intensity isn't really "measured," is it? Grazing intensity is a reflection of a measurement. Don't you mean to say, "Grazing intensity is determined by measuring the level of utilization on forage plants"?	The EA will be corrected at page 6 to state that: "Grazing use or intensity is determined by measuring the level of utilization on forage plants after the growing season, or relative utilization during the growing season". Grazing intensity is defined in Forest Service Handbook 2209.13, Chapter 90 as the degree of herbage removed through grazing and trampling by livestock. It may be described in terms of herbage removed during the grazing and/or growing period or as a utilization level at the end of the growing period. Utilization is strictly defined as herbage removed as assessed after the growing season. Relative utilization can be measured while plants are actively growing. By using the term grazing intensity as it refers to adaptive management, we are acknowledging that changes can occur prior to the end of the growing season based on grazing intensity.
6	17	I also do not understand your use of the word "potential." There may be a scientific use I am not getting, but my dictionary tells me it means "a state which is not yet fully realized" or a state "existing in possibility." Yet you have numerous statements like the following, from page 19: "Grass cover was 98%, which is almost five times more than potential,"	Page 18 and 19 of the EA describes how the potential plant community is determined from the Ecological Classification of the PNF. Potential vegetation is vegetation in type, species, and diversity potentially able to exist on a given site based on the soil characteristics, climate, slope, aspect, and topography. Then it is delineated by total mean canopy cover for trees, shrubs, grasses, and sometimes forbs. When we record a total percent cover it is compared to the total cover mean by plant type, i.e. Grasses. The final EA will be clarified to reflect that his is "five times more than potential grass mean cover."
6	18	On page 27 you cite "Molinar et. al. (2011)" but this citation does not appear in your references page, unless you mean Molinar's 2001 paper on "Managing for Mulch." Do you?	The citation will be added to the final EA. This citation is found in the Vegetation and Range Specialist Report: Molinar, F., J. Navarro, J. Holecheck, D. Galt, and M. Thomas. 2011. Long-

Appendix 6 – Range Development Locations









Chino Small Grazing Allotments Management Environmental Assessment (EA) errata sheet

The Chino Small Grazing Allotments Management EA was finalized on June 26, 2015 and was sent out to the 6 individuals or groups that had responded during comment periods and had standing to file an objection during the 45-day objection period. The Reviewing Officer, Forest Supervisor Teresa Chase, received two objections. One objection was filed on behalf of the Western Watersheds Project (WWP) by Erik Ryberg. The WWP objection was focused on the draft Decision Notice/Finding of No Significant Impact (DN/FONSI) that documented the decision for the Quartz Wash Allotment. The WWP objection contained the contention that: The Forest Service proposes to increase the permitted use to 875 AUMs, which is over 300 AUMs more than has been grazed here in decades and is even more than the grazing capacity analysis concluded was proper. In reviewing the merits of this contention, a typographical error was discovered in the final EA.

Page 5 of the EA contains this paragraph:

Quartz Wash Allotment: Issue a term grazing permit to authorize seasonal grazing from November 1st through May 31st for a range of cattle numbers typically between 75-125 adult cattle. Under adaptive management, less than 75 cattle may be authorized in a given season depending on resource conditions and forage and water availability. The total authorization in a given season would not exceed 875 AUMs. The three pastures on the allotment are the Quartz, Center, and Fritsche pastures and they would be used in a deferred rotation grazing system to give pastures some deferment while cool-season plants are actively growing. Pastures would receive warm-growing season rest every year.

The first sentence should be corrected to read: Issue a term grazing permit to authorize seasonal grazing from November 1st through May 31st for a range of cattle numbers typically between **75-120** adult cattle.

In addition, the third sentence should read: The total authorization in a given season would not exceed **845** AUMs.

The calculated grazing capacity for the allotment is correctly stated as 845 AUMs on page 38 of the Vegetation and Range Management Specialist Report for the Quartz Wash Allotment (Project Record document #39). The typographical error does not affect the outcome of the analysis. The upper limits of grazing that could be achieved under the best growing conditions and once soil conditions improved in TEUI 412 would be equal to the calculated capacity that is 845 AUMs. The various specialists documented the effects of grazing whereby the yearly stocking level is adapted to current resource conditions, and allowable use levels are not exceeded.

In addition, the Heritage Resources Section on Page 66 should read:

The Quartz Wash Allotment proposes to issue a term permit for seasonal grazing with a range of cattle between 75 and **120** adult cattle (not to exceed **845** AUMs).

Bold Type indicates corrections from original text of final EA dated 6/26/2015 (Project Record document #61A)