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Environmental Assessment

Tank Creek and Tonto Mountain

Grazing Allotments Management

Bradshaw Ranger District, Prescott National Forest
Yavapai County, Arizona



**VIEW OF
WEST
PASTURE
ON THE
TANK
CREEK**

ALLOTMENT

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Introduction ---

The Bradshaw District Ranger is proposing to continue the authorization of livestock grazing on the Tank Creek and Tonto Mountain Allotments under an adaptive management system. This proposal will analyze combining the Tank Creek and Tonto Mountain Allotments as these two allotments are currently administered together, naming it the Tank Creek Allotment. The Tonto Mountain Allotment would be managed as a pasture of the Tank Creek Allotment. An Allotment Management Plan (AMP) would be created to provide grazing management prescriptions. An analysis of the environmental effects of this proposal is hereby being initiated and will result in documentation which will display the effects of the proposed action as well as a no grazing alternative 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) and other relevant Federal and State laws and regulations. Based on this analysis, the responsible official will make a decision on which alternative to select.

1.1 About the Grazing Allotments

The Tank Creek and Tonto Mountain Allotments represent an area of approximately 39,000 acres. These allotments are located in the northwest portion of the district, approximately 5 miles north of Skull Valley, AZ and approximately 15 miles west of Prescott, AZ. The allotments are bordered by the Smith Canyon and Toohey Allotments on the north and west, and deeded land on the west, and Buckhorn, Brushy, and Contreras Allotment on the south.

The Tank Creek Allotment elevation ranges from 4190 feet in Sycamore Creek in the western portion of the allotment to ~5964 feet on Mount Josh, 97% of the allotment is in the Santa Maria River Watershed with the remaining 3% in the Big Chino Watershed. The topography varies from gently rolling mesa to steep rocky hill tops. There are several granite buttes scattered across the allotment. Major drainages are Weed Canyon, Woods Canyon, Hog Canyon, Dougherty Canyon, and Sycamore and Tank Creeks. Riparian vegetation occurs along these stretches and is dominated by woody species such as cottonwood, velvet ash, and willows, with some areas of grass and grass-like vegetation where sediment has built up to form stream banks.

Tonto Mountain Allotment is located to the east and is adjacent to the Tank Creek Allotment; the allotment is dominated topographically by Tonto Mountain, elevation 5631 feet on the east side and Mount Josh, elevation ~5964 feet on the west side of the allotment. The vegetation is predominately chaparral and ranges in density and composition across the allotment. Juniper is scattered across the allotment as well. There are no perennial streams on the allotment.

Vegetation on both allotments consists primarily of piñon and juniper with evergreen shrub and interior chaparral plant species. Canopy cover from shrub species is moderately to extremely thick in some locations to the extent that herbaceous forage is reduced or absent. A portion of the forage base of the allotment is provided by browse species such as turbinella oak with mountain mahogany, deerbrush, and skunkbrush found in smaller quantities. Perennial grasses can be locally abundant, especially in juniper woodlands that have been previously thinned and

on warmer southern aspects of hills. Important forage grasses on the allotments include blue grama, sideoats grama, threeawns, sand dropseed, tobosa, curlymesquite, and squirreltail.

Precipitation patterns for these areas are bi-modal with monsoon events occurring during the summer and a second period of precipitation occurring within the winter season. Precipitation at the Chino Valley station recorded 13.7" for 2015, 8.85" for 2016. These records can be found on the internet at the site: www.wrcc.dri.edu for the Western Regional Climate Center. For the period of record from 1941 to 2016, the mean annual precipitation was 11.9". Cool-season precipitation (October through May) for this timeframe had a mean of 6.2", and summer precipitation (June through September) accounted for 5.7". The average minimum temperature typically occurs in December, and is around 20 degrees F, and the average maximum temperature occurs in July at just over 90 degrees F.

Bagdad has precipitation and temperature records from 1925 to 2012 found at the same internet site. For a period of record from 1925 to 2012, the mean annual precipitation was 14.4". Cool-season precipitation (October through May for this timeframe had a mean of 9.4", and summer precipitation (June through September) accounted for 5". The average minimum temperature typically occurs in January, and is around 32 degrees F, and the average maximum temperature occurs in July at 96 degrees F.

Recreational activity on these allotments is primarily associated with dispersed camping, off road vehicle use, and hunting. Access is not limited. There are some motorized trails on both allotments that receive some use from off-highway vehicles, although these trails are rough and often used only by experienced riders. There are no developed recreation sites for camping on either allotment. Big game hunting opportunities exist for deer, elk, bear, and javelina. There are no designated wilderness areas on either allotment.

1.2 How is Grazing Managed on the Prescott National Forest?

This Environmental Assessment (EA) is based upon background information about the allotments including current and past inventory and monitoring data, the desired condition of resources on the allotments derived from direction and guidelines in the Prescott NF Land and Resource Management Plan (Forest Plan), as well as from resource specialists' knowledge of the allotment. The Forest Plan was revised in 2015. This project is utilizing the direction in the new plan related to desired resource conditions and rangeland management. You can find the 2015 Forest Plan on the internet at: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3847427.pdf

The Forest Plan provides guidance for the management of multiple-use activities that occur within the Forest. There are standards, guidelines, and management area direction found within the plan, as well as statements related to the desired conditions for various resources such as vegetation, watersheds, riparian areas, soils, and wildlife¹. 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.

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

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.

Purpose and Need for the Project _____

1.3 What is the Purpose of this Proposal?

The purpose for this action is to continue to authorize livestock grazing by developing an Allotment Management Plan (AMP) that is consistent with the Forest Plan and will allow for desired resource conditions to be met, and combine the Tank Creek and Tonto Mountain Allotments into one allotment. Also, there are some key areas on the allotments where soil condition and the amount and kind of vegetation present is not meeting desired conditions. Drought and a lack of fire have led to a departure from the desired vegetation structure and a decline in the quality of rangeland and watershed functionality. These changes include encroachment by juniper species and shrubs, loss of perennial grass cover, and an increase in exposed soil surface; as such, a portion of the purpose of this analysis is to determine which potential vegetation types (PNVTs) are departed from Desired Conditions and analyze which vegetation treatments are available and what changes in grazing management are needed to move the potential natural vegetation types (PNVTs) to the desired conditions.

1.4 Why Is There a Need for this Proposal?

There is a need to provide for management flexibility in order to address changing ecosystem conditions, site specific concerns, and desired resource conditions. There is a need to move the departed potential natural vegetation types (PNVTs) towards the desired conditions. There is a need for change in grazing management when existing resource conditions do not meet the desired resource conditions. There is also a need to utilize range improvements to improve livestock distribution, facilitate herd management, and address resource concerns.

There is a need to reroute two short sections of Forest Roads 9400A and 9405C located on the southeast portion of the Tank Creek Allotment. These roads veer off National Forest System lands and onto private property in two locations; one for approximately one-tenth mile and one for approximately one-quarter mile. In order to ensure continued access for allotment management as well as for the public along this road, and to reduce the risk of impacts to private property from the continued use of the road. The Forest Service has determined it would be best to relocate those sections of road so that they are on National Forest System lands.

1.5 What Are We Proposing?

The Proposed Action is Alternative 1, consisting of the following:

Authorization:

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

To combine the Tank Creek and Tonto Mountain Allotments into one allotment and naming it the

Tank Creek Allotment. Authorize a range of livestock numbers from 375 - 405 head of adult cattle, cow/calf pairs and bulls yearlong not to exceed 4860 AUMs³. Livestock will be managed on a deferred rotation system. The annual authorization will vary based on adaptive management, considering forage production, water availability, and resource conditions. Annual stocking could fall below the low end of the proposed stocking range. Pasture rest and deferment will be scheduled to provide for achieving desired resource conditions.

The term grazing permit for this allotment 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 toward desired conditions or are being maintained in satisfactory condition, as appropriate.

Adaptive Management

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

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 (AOI) and the Allotment Management Plan (AMP) may be modified as appropriate to adapt management within the parameters of this proposal.

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

These modifications would be made through administrative decisions such as: the specific number of livestock 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.

³ Animal Unit Month (AUM) – The quantity of forage required by one mature cow (1,000 pounds) or the equivalent for 1 month; approximately 26 lbs. of dry forage per day is required by one mature cow or equivalent.

Resource Protection Measures

Resource protection measures will be incorporated into the project as design features to protect forest resources such as soil, vegetation, and riparian habitats; as well as to maintain or make progress toward desired conditions. Best Management Practices will be implemented to comply with the Clean Water Act.

Allotment-wide Measures: On those portions of the allotment where no specific resource concerns were identified by the Interdisciplinary (ID) Team, livestock will be managed with the objective of maintaining or improving the condition of rangeland resources through the use of grazing intensity guidelines. Grazing intensity is measured by determining the level of utilization on forage plants. Utilization is the proportion or degree of current year's forage production that is consumed or destroyed by animals. Allowable utilization levels are guidelines to be achieved as an average over the long term to maintain or improve rangeland vegetation and long-term soil productivity. Relative utilization may be measured before and during the growing season and can be utilized as a tool to manage livestock so that expectations of end of growing season utilization measurements can be achieved.

Holechek and Galt (20004, 20044) 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; and (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 deer grass 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.

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

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

Site-specific Resource Protection Measures: Through the allotment analysis process undertaken by the interdisciplinary team, some issues have been identified where management adjustments and site specific design features were developed in order to attain desired resource conditions. Management objectives are specific, measurable, vegetation or soil parameters that can be quantified to determine whether progress is being made towards desired conditions. The soil map unit TEUI 427 in Stevens Pasture has low similarity between existing perennial grass cover and composition as compared to what the soil is capable of supporting. TEUI 461 in Sycamore/Dougherty pasture has low similarity between existing perennial grass cover and composition as compared to what the soil is capable of supporting. Key soil map unit TEUI 448 in D1 West Pasture and TEUI 430 has low similarity between existing perennial grass cover and composition as compared to what the soil is capable of supporting.

The management objective for low-similarity of graminoid vegetation is to improve grass cover and composition to mid-similarity rating when compared to site description. Where soil condition is rated unsatisfactory, the management objective is to improve compaction, graminoid cover and the spatial distribution of vegetation levels similar to the site descriptions.

Site-specific measures are summarized as follows:

1. Stevens trap Pasture TEUI 427

- a. Incidental use of 0-30% would be authorized in this soil map unit until satisfactory progress towards similarity (increased diversity) and groundcover objectives have been achieved.
- b. Integrate seasonal deferment or rest, use pasture to hold livestock for short periods.
- c. Improve livestock access when not using the trap by closing gates and checking to make sure livestock do not re-enter the pasture after short period of use.

2. Sycamore enclosure Pasture TEUI 430

- a. Improve water gaps and make sure fence maintenance is completed to keep livestock out of pasture. Extend fence approximately 250 yards to the west to secure the pasture.
- b. No use will be authorized in this enclosure pasture until satisfactory progress toward improved graminoid cover and improved spatial distribution of vegetation to improve soil organic matter, soil stability, and to assist in improving compacted soils is met. Once this progress has been met then use could be authorized once every 3-5 years with an allowable use of 30% on key upland species, and up to 50-60% leaders browsed on key upland woody species;
- c. Minimum stubble height on key riparian herbaceous species: four to six inches where sedges and rushes are key and eight inches where deer grass is key; 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 on key riparian species.

3. D1 West Pasture TEUI 448

- a. There is low similarity between existing perennial grass cover and composition as compared to what the soil is capable of supporting. This area requires vegetation

treatments of prescribed fire and mechanical methods to remove the brush in order to improve the perennial grass cover and composition.

4. Sycamore/Dougherty Pasture TEUI 461

- a. This site was selected to collect initial data in this TEUI. There is low similarity between existing perennial grass cover and composition as compared to what the soil is capable of supporting. This site can be monitored in the future to determine if a positive response occurs, if vegetation treatment occurs, to determine if vegetation manipulation would create a positive change in the vegetation. It is anticipated that the grasses should respond once some of the shrubs and trees are removed. This site is lacking in grass diversity. Only 3 species were found and nine are expected in this TEUI.

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

Additional resource protection measures may be implemented. These measures will be designed to address site-specific resource concerns and may include, but are not limited to, such things as temporary fencing, electric fencing, drift fences, additional livestock enclosures, water pipelines, water storage and troughs; reconstruction of non-functional improvements and construction of new improvements such as spring boxes, drift fences, and water gaps, and rest or deferment of the pastures during treatment times. The USFS will coordinate with permittee for out-year scheduling.

Structural Range Improvements

Construction of New Range Improvements: This alternative includes construction of the following new structural improvements that have been developed to address resource concerns or improve grazing management. Future monitoring may indicate that some of these improvements are not necessary. Different types of water developments may be employed depending on the location, and could include a catchment apron and storage tank (“trick tank”) with pipeline to water troughs.

The following are the proposed Structural Range Improvements:

1. Construct 1 reliable water development (Windmill or Trick Tank) in Tonto Pasture on the west side, in the northeast corner of section 16.
2. Construct 1 reliable water development (Windmill or Trick Tank) in D1 East Pasture on the south side, in the center of section 16 at Juniper spring development.
3. Construct 1 reliable water development (Windmill or Trick Tank) between D1 East and D1 West Pastures in the southwest corner of section 8.
4. Construct 1 reliable water development (Windmill or Trick Tank) in D1 West Pasture in the middle of the current pasture and on the proposed fence line to divide the pasture, in the southwest corner of section 11.
5. Construct a north south fence to split the D1 West pasture into D1 West and Twin Buttes pastures.

6. Construct an east-west fence to split South Pasture into Tank Creek and Bald Mountain Pastures.
7. Construct fence within the Sycamore Pasture to include a portion of that pasture into the new Tank Creek Pasture.
8. Construct a water-lot and corral fence around a tank on Sycamore mesa in the Sycamore/Dougherty Pasture to better control livestock use patterns.
9. Add a 30,000 gallon storage tank to existing trick tank in South pasture in section 5.
10. Extend the Sycamore Exclosure pasture fence (approximately 250 yards) in the far western portion of the exclosure pasture to secure the exclosure.
11. If and when the Burnt Wash #2 or the Jack Jones spring tanks require maintenance, the permittee will contact the USFS Tank Creek Allotment Permit Administrator. The USFS would install a “drop structure” to provide a self-cleaning mechanism for the spring tank(s). If it is determined that the drop structure is unsuccessful, the permittee can perform maintenance of the spring tanks with a backhoe.

(See Proposed Structural Range Improvement map in Appendix 1)

Non-Structural Range Improvements:

Vegetation Treatments:

The proposed action contains vegetation treatments in four potential natural vegetation types (PNVTs) that are expected to provide benefits across multiple resource areas (Table 1). The proposed treatments include the use of fire in all four PNVTs and the use of mechanized equipment in Juniper Grassland and Piñon-Juniper Evergreen Shrub to open up the tree canopy and in Interior Chaparral to protect desired vegetation components. Mechanized equipment may also be used in Interior Chaparral and Piñon-Juniper Evergreen Shrub to create fuel breaks around wildland-urban interface (WUI) areas. The spatial distribution of these treatments is shown on the Tank Creek/Tonto Mountain Allotments Vegetation Treatment map (Figure 1).

Tank Creek/Tonto Mountain Allotments

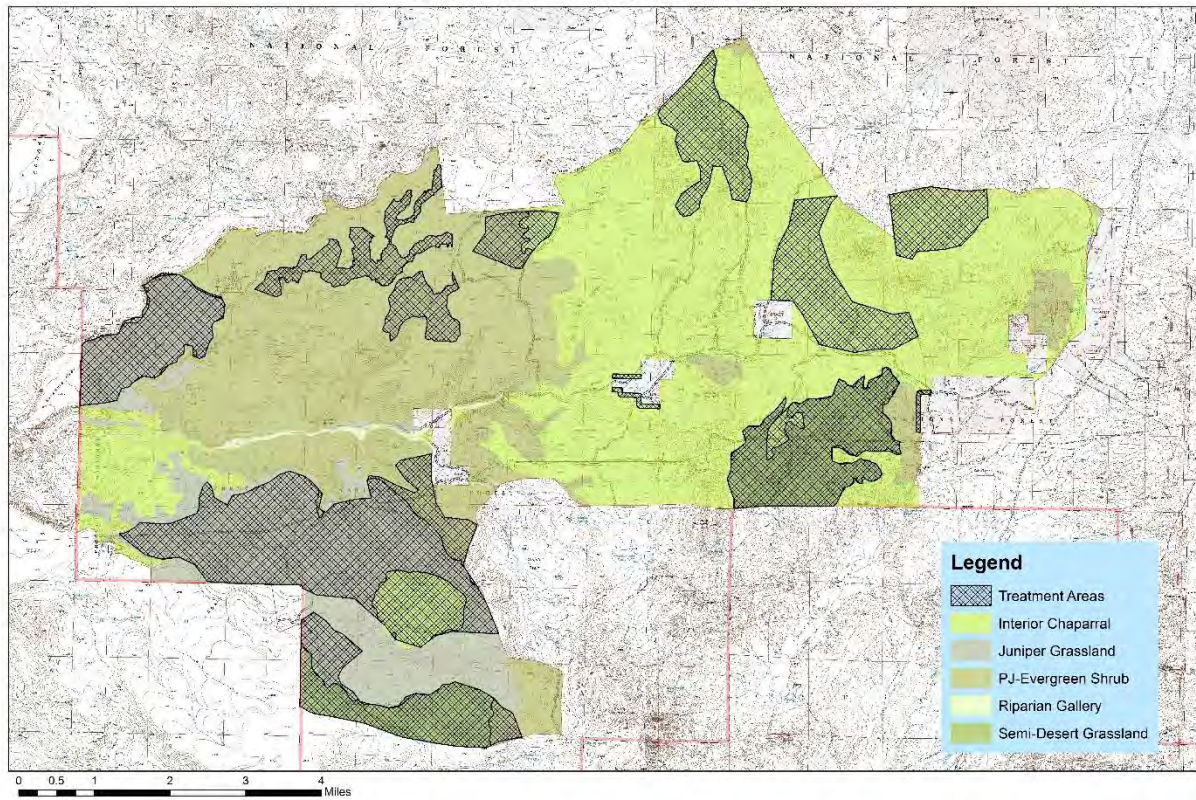


Figure 1. Vegetation treatment map for the Tank Creek/Tonto Mountain Allotments

Potential Natural Vegetation Type	Treatment type	Treatment Acres
Piñon-Juniper Evergreen Shrub	Use mechanical treatment and wildland ⁵ fire to open canopy to < 30% Maintain < 30% tree canopy with mechanical treatment and wildland fire	1,687
Semi-Desert Grassland	Use wildland fire and hand thinning to reduce overstory canopy Maintain grassland and open canopy with wildland fire and hand thinning	2,436
Juniper Grassland	Mechanical treatment to open canopy Maintain conditions with wildland fire and mechanical treatment	4,310

⁵ Wildland Fire – (Forest Plan Glossary page 150) – Wildland fire is any non-structural fire that occurs in vegetation or natural fuels. It includes both wildfires and prescribed fires.

Potential Natural Vegetation Type	Treatment type	Treatment Acres
Interior Chaparral	Maintain vegetation conditions with wildland fire	3,364
	May use mechanical treatment to protect pinon and alligator juniper trees and create fire lines around WUI	
Totals		11,797

Piñon-Juniper Evergreen Shrub

The Piñon-Juniper Evergreen Shrub PNVT is moderately departed from desired conditions. Currently, about one-half of the Piñon-Juniper Evergreen Shrub in the project area is in a closed tree canopy cover state; however, a field visit confirmed much of Sycamore Mesa contains characteristics that are more indicative of a persistent Piñon-Juniper woodland, rocky shallow soil, low productivity, sparse herbaceous cover, multiple age classes of juniper and no evidence of recent fire. These areas should be managed as a closed canopy, woodland system. However, areas identified as true Piñon-Juniper Evergreen Shrub, the proposed action would open closed-canopy woodlands to less than 30 percent canopy cover from tree species and maintain this state. This treatment would cover 1,687 acres and would be achieved using managed wildfire, prescribed fire and mechanical treatment to primarily benefit vegetation and fire class condition.

An additional 10,235 acres would be improved or maintained through the use of managed wildfire or prescribed fire, focusing treatments in areas identified as vegetation overstory opportunities. The proposed action to open the closed canopy to less than 30 percent would increase the shrub and herbaceous ground cover and trend the PNVT towards desired conditions for vegetation structure and fire regime. Forest Plan Objective 3 directs the use of wildland fire to improve watershed and rangeland conditions, vegetation structure, and wildlife habitat in the Piñon-Juniper Evergreen Shrub PNVT.

Semi-Desert Grassland

As noted in the Forest Plan, the Semi-Desert Grassland PNVT across the forest shows severe departure from desired conditions in both vegetation structure and fire regime. Currently, about 90 percent of the Semi-Desert Grasslands within the project area have greater than 10 percent canopy cover from trees or shrubs. The desired condition for Semi-Desert Grassland is to have less than 10 percent woody canopy cover occur on 90 percent of the area. This allows for the growth and retention of the fine fuels that provide for and maintain the desired fire regime. Fire historically occurred every 2 to 10 years in the Semi-Desert Grassland PNVT.

The proposed action would open the canopy cover on 2,436 acres and would be achieved using hand thinning, managed wildfire or prescribed fire. This would provide multi-resource benefits, including improvements to ground nesting birds.

Juniper Grassland

Juniper grasslands are moderately departed from desired conditions due to fire exclusion. This has allowed for increases in the density and canopy cover of trees and shrubs and a reduction in fire stimulated regrowth and germination of perennial grasses and forbs. The desired fire regime is every 1 to 35 years with low severity favoring regrowth and germination of native grasses and forbs.

The proposal is to open the tree canopy to less than 30 percent with a combination of hand thinning and mechanical treatment on 4,310 acres. This condition would be maintained with managed wildfire or prescribed fire. An additional 2,241 acres would be improved or maintained through the use of managed wildfire or prescribed fire.

The proposed actions for the Juniper Grassland PNVT include both mechanical treatments and the use of wildland fire for canopy reduction and open-canopy maintenance. These treatments are supported by Objective 3 in the Forest Plan which directs the use of mechanical treatments and wildland fire to improve watershed and rangeland conditions, vegetation structure, and wildlife habitat in the Juniper Grassland PNVT.

Wildland fire could also be used when conditions are suitable. In the Juniper Grassland PNVT, research has found that woody plant mortality generally is greater the year following a fire than at the actual time of the burn due to damage to the cambium and phloem tissue in the tree trunk. This would improve habitat quality for pronghorn across much of the Juniper Grassland PNVT that is located adjacent to the Semi-Desert Grassland by creating a more desired open environment. This action is supported by Objective 26 in the Forest Plan, which direct the use of prescribed burning, mechanical tree removal, or other treatments to increase pronghorn antelope habitat quantity and quality in the grassland PNVTs.

Interior Chaparral

The species composition, structure, and fire regime found within the Interior Chaparral PNVT are similar to desired conditions, so there is little to no departure. Interior Chaparral is in a constant state of transition from young to older stages and back again, with high severity fire once every 35 to 100 years being the major disturbance factor. The proposal is to maintain these vegetation conditions and fire regimes through wildland fire or prescribed fire on 14,316 acres. Mechanical treatments may be used to create a buffer around isolated pinyon and alligator junipers to protect them from prescribed fire, and to create fire lines around WUI. The spatial distribution of the chaparral would not change, but there would be a short term shift in composition favoring faster sprouting species such as manzanita and shrub live oak. This, in turn, would increase the forage value to wildlife with the greater palatability of new growth.

These treatments are supported by Objective 4 in the Forest Plan which directs the use of wildland fire to maintain current conditions in the Interior Chaparral PNVT.

Maintenance of Range Improvements: The Term Grazing Permit includes a list of all structural 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.

While trails and roads are not range improvements they are critical to livestock movement and management on the Tank Creek Allotment, Trail 9440 is key to successful management of Tonto pasture. Trail 9402 is used to move through the trap pastures and D1 East and D1 West pastures.

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-country travel, travel needed for improvement maintenance, new improvement construction, or reconstruction of existing improvements.

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

Maintenance of Non-Structural Range Improvements:

Maintenance of Vegetation Treatments: All of the Potential Natural Vegetation Types (PNVTs) would be maintained by wildland, prescribed, and managed fire as well as through mechanical and hand thinning techniques. The maintenance interval would be based on the level of departure from the desired conditions as well as the vigor of the targeted vegetation.

Monitoring

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

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.

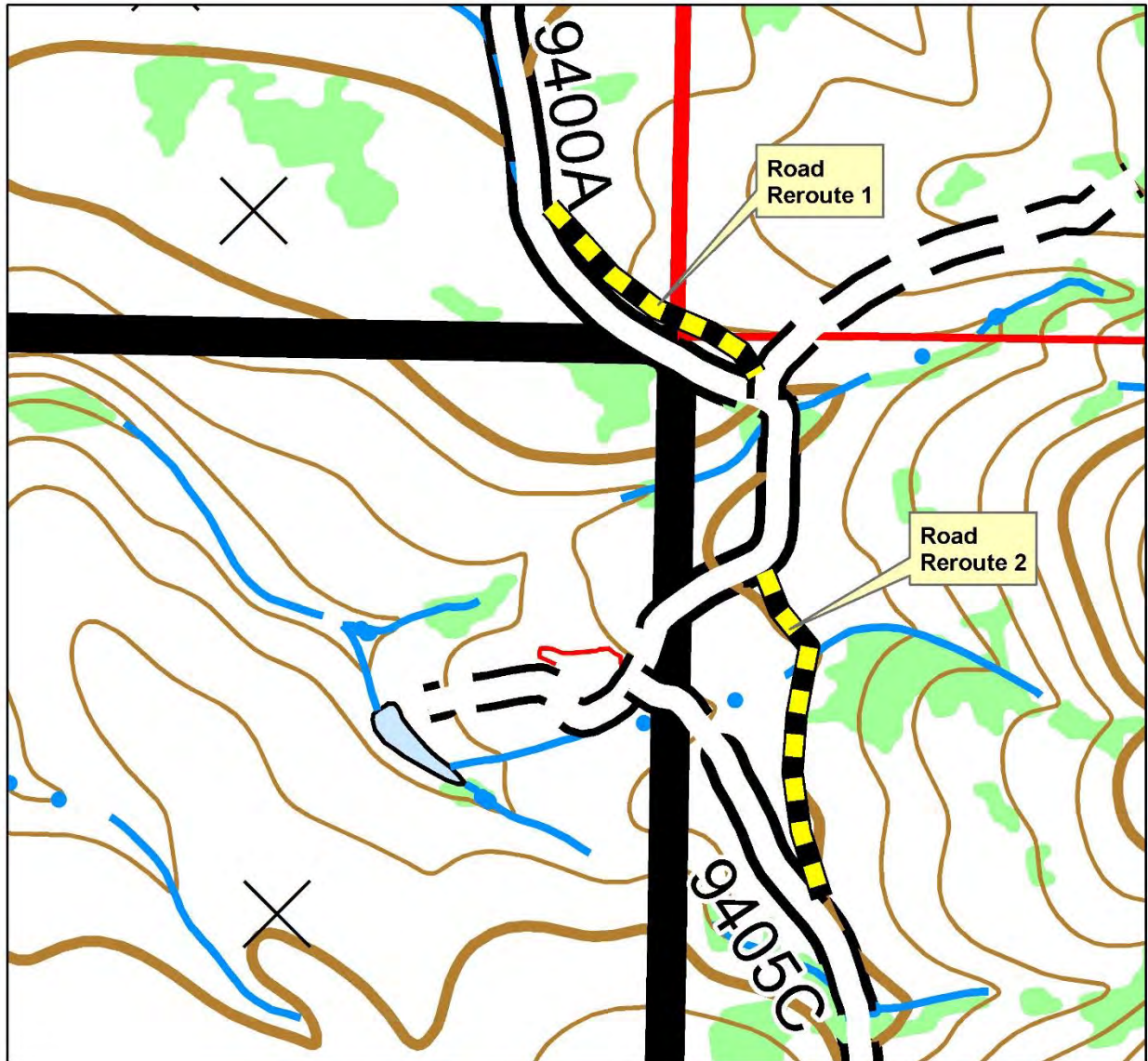
Roads

The Forest Service is proposing to reroute two short sections of Forest Roads 9405C and 9400A on the Bradshaw Ranger District of the Prescott National Forest.

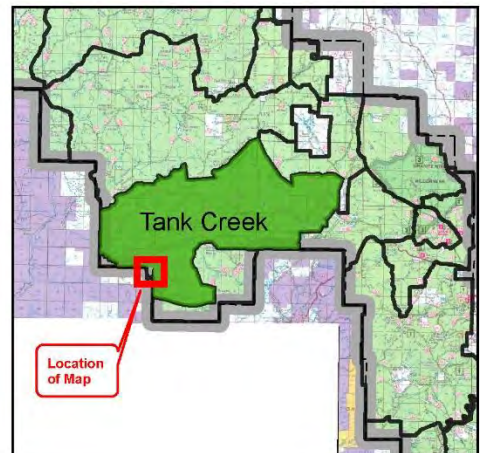
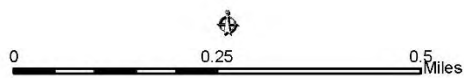
Forest Road 9405C and 9400A veers off National Forest System lands and onto private property in two locations; one for approximately one-tenth mile and one for approximately one-quarter

mile. In order to ensure continued access for the public along these roads and to reduce the risk of impacts to private property from the continued use of the road, the Forest Service has determined it would be best to relocate those sections of road so that they are on National Forest System lands.

Forest Roads 9405C and 9400A proposed realignment.



**Prescott National Forest:
Tank Creek Allotment
Proposed Road Reroute**



1.6 What Other Alternatives Are Being Considered?

Alternative 2: Is the No Action/No Grazing Alternative required by Forest Service policy.⁶

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

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

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

Maintenance of Existing Range Improvements: Under this alternative, maintenance of range improvements normally assigned to the permit holder would no longer occur. After cancellation of the Term Grazing Permit, existing structural improvements that contribute to resource protection or that are important to other resources and functions, such as water sources for wildlife populations or fire control, would remain but would not be maintained unless this activity were funded under another resource area on the Prescott NF or by a cooperating partner. Removal of improvements losing their functionality would have to be authorized under a future NEPA decision if new ground disturbance were anticipated. Where allotment boundary fences are necessary, the maintenance of these fences could be reassigned to adjacent grazing permit holders in order to maintain the integrity of the boundaries of adjacent allotments.

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

Who Will Make the Decision and What Will be considered?

The Bradshaw District Ranger is the responsible official who will decide, based upon the Purpose and Need for this action, the information provided in this EA, the project record, public input, and other considerations, whether to continue livestock grazing on the Tank Creek and Tonto Mountain 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.

⁶ FSH 2209.13, Chapter 90, Section 92.31

In addition to this decision, the District 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.

How long is the Decision Valid?

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

A project-level, NEPA-based decision, such as the decision to be made based upon this analysis, remains valid as long as the authorized activity continues to comply with laws, regulations, and the Forest Plan. Reviews of existing project-level decisions are made periodically to determine if the grazing activity, permit(s), AMP, and AOIs are consistent and within the bounds of the existing NEPA documentation; if that analysis and documentation continue to remain valid; or if new information exists that requires some further analysis and potential modification of the activity. If the responsible official determines that correction, supplementation, or revision is not necessary, implementation of existing decisions shall continue.

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.

Table 1: Comparison of Alternatives and Effects for Tank Creek Allotment

Resource	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
Authorization (AUMs, Season of Use & Term)	Tank Creek: Yearlong grazing by between 375-405 adult cattle in a typical year, less under drought conditions.	No cattle authorized
Grazing Intensity	In areas of satisfactory condition, a management guideline of 35-45% forage utilization of key forage plants in upland key areas as measured at the end of the grazing season, and up to 50- 60% browse use on key upland woody species; Incidental or light use from 0-30% in areas needing improvement along with rest and deferment.	N/A
New Structural Improvements	Provide up to 4 new water developments and make 1 existing source more reliable; construct 3 pasture division fences, 1 water lot, extend one existing pasture fence, and install 1-2 drop structures.	No new range developments constructed.
New Non-Structural Range Improvements	<p>Piñon-Juniper Evergreen Shrub Use mechanical treatment and wildland fire to open canopy to < 30%</p> <p>Maintain < 30% tree canopy with mechanical treatment and wildland fire 1,687 acres.</p> <p>Semi-Desert Grassland Use wildland fire and hand thinning to reduce overstory canopy. Maintain grassland and open canopy with wildland fire and hand thinning 2,436 acres</p> <p>Juniper Grassland Mechanical treatment to open canopy. Maintain conditions with wildland fire and mechanical treatment. 4,310 acres</p>	No new Non Structural Range Improvements constructed.

Resource	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
New Non-Structural Range Improvements (cont'd)	Interior Chaparral Maintain vegetation conditions with wildland fire. May use mechanical treatment to protect pinon and alligator juniper trees and create fire lines around WUI. 3,364 acres Total 11,797 acres	
Maintenance of Improvements	Existing necessary improvements listed on the term grazing permit are maintained to standards by grazing permittee; new improvements will increase maintenance responsibility.	Maintenance of range improvements discontinued except for maintaining allotment boundary fences by adjacent permittees. Without a permittee, maintenance responsibility will default to the Forest Service or cooperating partner for any infrastructure deemed essential.
Monitoring	Short and long-term monitoring of implementation and effectiveness of adaptive management during term of permit.	Monitoring of non-use compliance.
Upland Vegetation	Growing season rest or deferment provided in all pastures through grazing rotation strategy; allowable use levels will lead to 55-65% of biomass being retained on site after grazing to improve litter cover, soil protection, and water infiltration. In areas needing vegetation improvement, 70% or more vegetative biomass retained.	Livestock use discontinued. Improvement in herbaceous vegetation cover and species

Resource	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
Watershed/Soil	<p>Soils in less than satisfactory condition would improve within their ecological capability through the application of resource protection measures designed to improve vegetation condition. Implementation of allowable use levels allows for 55-65% of biomass to be retained on site, and areas needing improvement would retain over 70% of biomass on site.</p> <p>Retention of biomass would allow organic matter to be incorporated into the soil for nutrient cycling and protection from accelerated soil loss. Integrating rest allows freeze-thaw cycles to break up soil compaction.</p>	<p>Soils in less than satisfactory condition would improve within their ecological capability. More biomass is retained on site every year than under alternative 1. Retention of biomass would allow organic matter to be incorporated into the soil for nutrient cycling and ground cover for protection of the soil from accelerated soil loss. Improvement may occur at a slightly faster rate than alternative 1. In areas where unsatisfactory soil condition is occurring due to dense juniper canopy and lack of herbaceous cover, there would be minimal change by removing livestock.</p>
Threatened, Endangered, & Sensitive Species	<p>No effects to Federally listed species or their proposed/critical habitats since none occur on the allotment.</p> <p>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.</p>	<p>No effects to Federally listed species or their proposed/critical habitats since none occur on the allotment.</p> <p>With no livestock grazing or other project activities, there would be no impact on Regional Forester sensitive species.</p>
Bald and Golden Eagles	<p>There are no bald eagles in the project area. Livestock management activities are not likely to impact nesting golden eagles. Surveys for occupancy would occur for proposed vegetation treatments near nest sites. No impacts to eagles or prey habitat</p>	<p>With no livestock grazing or other project activities, there would be no impacts from the proposed action on eagles.</p>

Resource	Alternative 1 Proposed Action	Alternative 2 No Action/ No Grazing
Migratory Birds	Livestock grazing has little effect on migratory birds. Negative impacts from vegetation treatments would be of short duration and a small localized scale. Long term benefits would include improved prey species habitat for insects and small mammals and improved quality of forb and seed production in earlier seral stages of vegetation.	With no livestock grazing or other project activities, there would be no impacts from the proposed action on migratory birds.
Archeology	No adverse effects on heritage resources. Avoidance of impacts to cultural resources during construction of new range improvements.	No effects on heritage resources.
Recreation	No adverse effects on recreational opportunities	No effects on recreational opportunities
Compliance with Forest Plan and Federal Regulations 36 CFR 222.2 [c]	Through application of grazing management, Forest Plan goals for resource management are met over time. Consistent with policy to manage forage-producing Federal lands for livestock grazing.	Yes, achieves Forest Plan resource management goals. Not consistent with direction to manage forage-producing lands for livestock grazing.

What Has Already Occurred in the Project Area?

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

The following table summarizes the past, present, and future activities within the Tank Creek Allotment. For some resource areas, the primary, 6th code sub-watersheds that contain portions of the allotment were considered for the cumulative effects analysis, and for others the area of consideration is limited to the allotments themselves. The primary 6th code sub-watersheds that contain the project area are: Cottonwood Canyon, Tonto Wash, Weed Canyon, Upper Sycamore Creek, Strickland Wash, Tank Creek, and Smith Canyon. The map in Appendix 3 illustrates the 6th code sub-watersheds in relation to the project area.

Table 2: Past, Present, and Future Activities in the 6th Code Sub-watersheds 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 sub-watersheds containing	none	unknown
Veg Treatment Projects / Non-Structural Range Improvements / Rx Burns	In 1988 the Black Jack prescribed burn occurred to reduce chaparral cover on approximately 7,600 acres on the Tank Creek Allotment.	none	Tank Creek Allotment Vegetation Project; Juniper thinning, prescribed burning, chaparral treatments, & vegetation maintenance would occur in the next 10 years.

Type of Activity	Past Activities/Events	Present Activities	Future Activities
Livestock Grazing	Project area has been grazed by domestic livestock since the late 1800s. Stocking levels were not in balance with forage supplies historically, resulting in some areas of overgrazing.	For the project area there will be managed grazing with stocking in balance with forage supplies; allotments are managed with approved Allotment Management Plans or through Annual Operating Instructions.	Stocking levels determined through adaptive management and in balance with annual forage supplies.
Recreational Activities & Fuelwood Cutting	Motorized and non-motorized trails; dispersed recreation (primarily OHV use, target shooting, hunting)	There are 2 trails in the Tank Creek Allotment. These trails are designated for motorized use.	No anticipated change; no known new trails planned
Roads, Utility ROWs, Land Development and Land Exchanges	Roads developed on National Forest land within the 6 th code HUCs containing the project area to access private lands, and forest resources; utility corridors developed to private land inholdings	Road route density is within the range of 1 to 2.4 miles per square mile.	Minimal road reroute is planned; No new facilities planned; no land exchanges anticipated.

1.7 What are the Impacts to Rangeland Vegetation?

Existing Condition:

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

For this project, the ID team defined the desired condition for vegetation as: the maintenance of vegetation with mid to high similarity to the Desired Vegetative Status (DVS) providing for ecological functionality and resiliency following disturbance while sustaining long-term productivity of the land. Mid to high similarity is defined as more than 34% similar to the potential plant community.

Since cattle prefer to consume grasses over shrubs, when present, the similarity of the perennial grass component was the main factor in determining whether desired conditions were being met. The DVS is the species composition and cover for the potential plant community, or ecological type (ET), as shown in the Terrestrial Ecosystem Survey of the Prescott National Forest (USDA 2000) and the associated Ecological Classification of the Prescott National Forest (USDA 2006 draft) for the key soil types found on the allotments. However, in some cases the ET perennial grass indicator species may not have been present in the site sampled, but if desirable perennial grasses were present instead with canopy cover similar to ET average cover, then DVS was being met by existing conditions. In addition, the Forest Plan desired condition for vegetation (DC-Veg-3) states: “Vegetation on lands deemed suitable for livestock grazing provides sustainable amounts of forage consistent with multiple-use objectives. Herbivory aids in sustaining or improving native vegetation cover and composition. Livestock grazing contributes to aspects of the social, economic, and cultural structure and stability of rural communities.”

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

Tank Creek Allotment

Table 3 TEUI Map Units Analyzed

TEUI Map Unit	Total Acres	Percent of Allotment
372	314	<1%
425	2856	7%
427	2779	7%
428	2199	6%
430	2262	6%
442	1946	5%
448	6383	16%
461	3729	10%
Total analyzed	22,468	58%

The TEUI map units can be further grouped together based on the potential natural vegetation type (PNVT) that occupies a particular TEUI map unit. There are six PNVTs on the allotment. Three PNVTs make up 94 percent of the allotment, Piñon Juniper Evergreen Shrub, Juniper Grassland, and Interior chaparral. Inventories concentrated on these three areas of the allotment.

The other PNVTs found on the allotment are Colorado Plateau Grassland, Riparian Gallery Forest, and Semi-desert Grassland. The TEUI units that make up the PNVTs is shown in Table 7. Cattle are known to prefer grasses over shrubs when they are available, so inventory locations with a low shrub and tree canopy were selected as key areas to determine grazing influence on herbaceous vegetation. Also, some key locations were established to have base information on the TEUI prior to vegetation treatments activities.

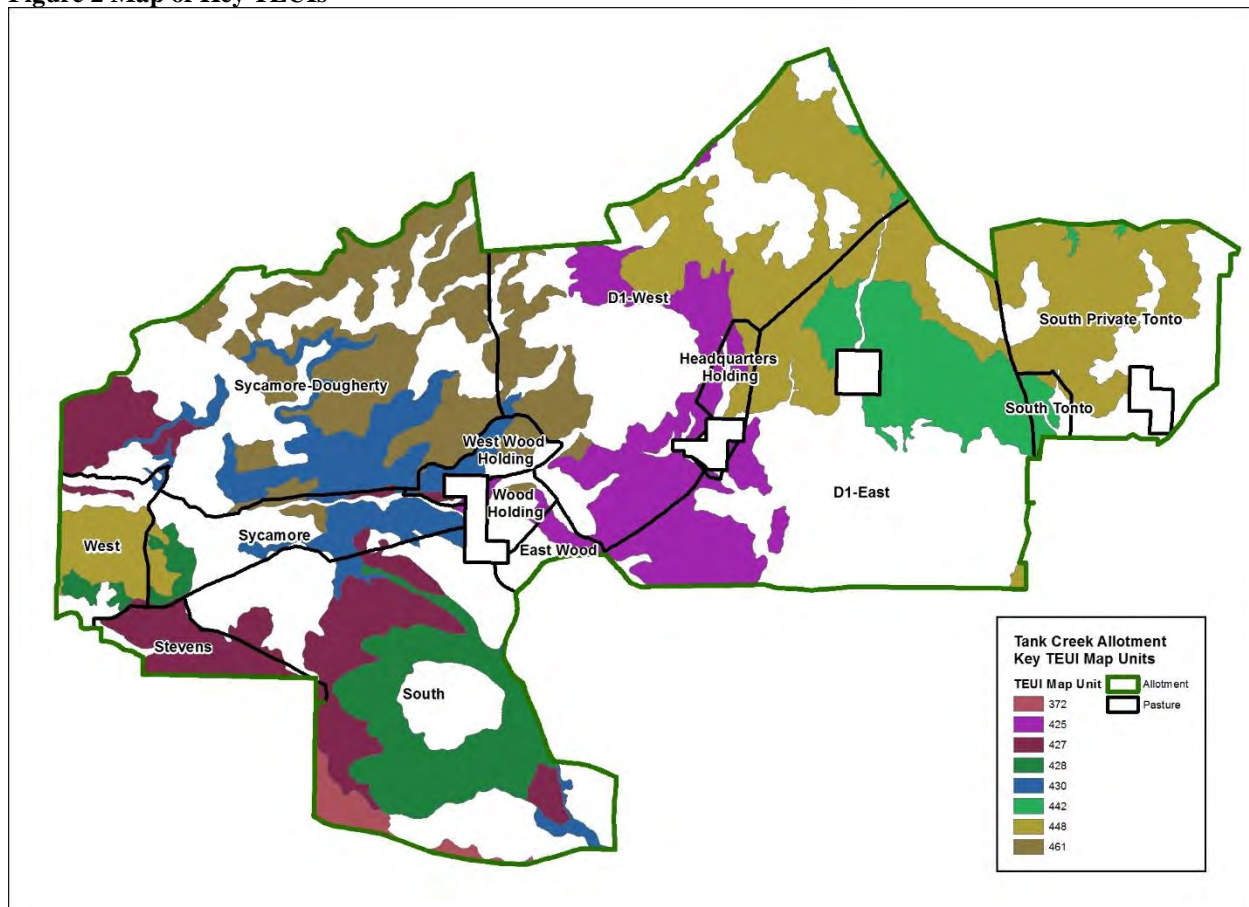
Shrubs provide a major amount of the available forage on the Tank Creek Allotment and areas with a large shrub component were inventoried as well.

Table 4 Potential Native Vegetation Type

PNVT	TEUI included Within	Acreage	Percent of Allotment
Piñon-Juniper Evergreen Shrub	430, 461, 462, 477, 479, 481, 486,	11,919	31
Juniper Grassland	427, 428, 431, 439, 463	6565	17
Interior Chaparral	47, 425, 436, 442, 443, 448, 450, 475, 483, 488,	17698	46
Colorado Plateau Grassland	433	1571	4
Riparian Gallery Forest	41	174	<1
Semi desert grassland	372, 373	886	1

(NOTE: Highlighted TEUIs are the ones that make up a majority of the allotment and the TEUI units for which trend data was analyzed)

Figure 2 Map of Key TEUIs



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

TEUI 425, D1 East Pasture

TES Map Unit:	425	Acres in Pasture:	999
		% of Pasture:	12

Existing Ecological Community Type: **ET1**

Sampled Vegetation			Potential % Cover, Species of ET1		Notes: Vigor was good and grass diversity exceeds ET1
Lifeform	% Cover	Primary Species:	% Cover	Primary Species:	
Tree:	10	Pied, Juniper	13	Juniperus spp. Pinus edulis	
Shrub:	24	Arpu, Cemo, Qutu,	39	Quercus turbinella, Rhus trilobata	
Perennial Grass:	20	Arist, Bocu, Bogr, Elel	15	Arist, Bocu, Bogr, Elel, Pofe	

Rangeland Management Status: Satisfactory

Approximated Ecological Status:	High-Similarity for perennial grasses (83%)
Correlation to Parker 3-Step Data:	None
Notes:	Comparing actual with ET1 the bare ground is now 5% litter is up 8% basal is up 1%.



Photo 1 above: Key TEUI map unit in D1 East pasture, TEUI 425, September 2016

Discussion: The key map unit in the D1 East pasture, TEUI 425, is Chaparral on hills and elevated plains with gentle to moderate slopes (0-40%) across the southwestern and central portion of the pasture. The vegetation for this map unit fits within the Interior Chaparral PNVT. Soils are shallow and very stony or very cobbly. Texture is course sandy loam. The site average is variable among the community types for tree shrub and graminoid cover. Tree cover ranges from 10-20% mostly comprised of Juniper. Shrub cover ranges from 32-68% cover primarily consisting of turbinella oak (*Quercus turbinella*). Perennial grass cover will vary depending on shrub and tree cover, having 15%

cover from indicator species three-awn (*Aristida spp.*), sideoats grama (*Bouteloua curtipendula*), blue grama (*Bouteloua gracilis*), squirreltail (*Elymus elymoides*), and muttongrass (*Poa fendleriana*).

The data to describe existing vegetation was collected September 2016. The growing season in 2015 and 2016 had about average precipitation and grasses were in good (Bogr-blue grama) and excellent (Bocu-sideoats grama) vigor at the time of sampling. Sampling occurred prior to annual grazing. Grass cover was 18% just above ET1 total graminoid cover mean of 15%.

Diversity of trees and shrubs are in line with expected numbers of species for ET1. The grass species were above expected species richness for ET1. Twelve perennial grass species were found on site, ET1 maximum is eight. Shrub species on site is 9 and expected is 9.

High shrub cover and low tree cover on this site match best with ET1, but the grass cover on site exceeds all classifications.

TEUI 427, Stevens Pasture

TES Map Unit:	427	Acres in Pasture:	646
		% of Pasture:	90

Existing Ecological Community Type: **ET1**

Sampled Vegetation			Potential % Cover, Species of ET1		Notes: Catclaw increased 27% since last read in 2008. Lack of grass diversity could be combination of drought and livestock management. This is a small pasture that has been used as a trap pasture and needs to be managed when not in use so not to exceed allowable use.
Lifeform	% Cover	Primary Species:	% Cover	Primary Species:	
Tree:	0		5	Juniperus spp.	
Shrub:	14	Prve, Yuba, Opuntia, Gusa, Erwr	20	Erwr, Gusa, Opuntia, Prve	
Perennial Grass:	6	Plmu, Elel	37	Bocu, Hibe, Plmu	

Rangeland Management Status: Unsatisfactory

Approximated Ecological Status:	Low-Similarity for perennial grasses (28%)
Correlation to Parker 3-Step Data:	Parker Cluster data from Cluster 35 also located in this TEUI shown in Table 5.
Notes:	It appears this site has been grazed for an extended time (yearlong).



Photo 2 above: Key TEUI map unit in Stevens pasture, TEUI 427, September 2016

Discussion: A key map unit in the Stevens pasture, TEUI 427, is pinon juniper woodlands found on lowland and elevated plains with gentle to moderate slopes (0-24%) located in the majority of the pasture. The vegetation for this map unit fits within the Juniper Grassland PNVT. Soils are deep, very stony, silty clay loam with high shrink/swell properties. The site average is variable among the community types for tree shrub and graminoid cover. Tree cover ranges from 1-7% comprised of Juniper, shrub cover ranges from 12-22% cover primarily consisting of shrubby buckwheat (*Eriogonum wrightii*). Perennial grass cover will vary depending on shrub and tree cover, having 30% average cover dominated by tobosa (*Pleuraphis mutica*) at 2% with sideoats grama (*Bouteloua curtipendula*) and curly mesquite (*Hilaria belangeri*) making up less than 5% each.

The data to describe existing vegetation was collected September 2016. This site grasses were in good vigor (*Plmu-tobosa*) at the time of sampling. Grass cover was 6%, 6 times less than ET1 total graminoid cover mean. The site selected is a historic sampling site for TEUI 427.

Diversity of grass on this site is well below expected when compared to the ecological classification guide. Only three grass species were found on site while ET1 averages 7. Of the three species on site one was a cool season grass, squirreltail consisting of just over <1% canopy cover.

The dominance of velvet mesquite is also a sign of disturbance. Mesquite is well adapted to compete with herbaceous species for moisture and may account for loss of grass cover, and could also be an indicator of warming temps moving vegetation higher up in elevation.

Recommend 30% allowable use until grass cover improves. Gates to the pasture will be shut when not being used and maintenance on the pasture fence will need to be done to make sure livestock

do not get in this trap pasture outside of the season of use. Once it recovers then allowable use can go up to 45%.

TEUI 461, Sycamore/Dougherty Pasture

TES Map Unit:	461	Acres in Pasture:	7497
		% of Pasture:	37

Existing Ecological Community Type: **ET1**

Sampled Vegetation			Potential % Cover, Species of ET1		Notes: The tree component at this site is 63% similar to ET1 PNC, shrub component is 0% similar, and the graminoid component is 1% similar to the described average.
Lifeform	% Cover	Primary Species:	% Cover	Primary Species:	
Tree:	17	Juniper	36	Juniperus spp. , Pied	
Shrub:	3	Qutu, Gusa, Opuntia	20	Gusa, Qutu, Rhtr	
Perennial Grass:	10	Bocu, Bogr Bohi, Elel	16	Bocu, Bogr, Bohi, Elel	

Rangeland Management Status: Satisfactory

Approximated Ecological Status:	Low-Similarity for perennial grasses (1%)
Correlation to Parker 3-Step Data:	None
Notes:	Good vigor on the grasses, soil is lacking development, lacks topsoil, lots of exposed rock, no continuous grass stands, little grass diversity, litter from juniper inhibiting grass growth. Junipers in this area need treatment so grass diversity can recover.



Photo 3 above: Key TEUI map unit in Sycamore/Dougherty pasture, TEUI 461, September 2016

Discussion: A key map unit in the Sycamore/Dougherty pasture, TEUI 461, is pinon juniper woodlands found on elevated plains with gentle slopes (averaging 4%) located in the northern and

southern portion of this pasture. The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNVT. Soils are shallow to moderately deep, extremely cobbly to extremely stony, clay loam or sandy clay loam with high shrink/swell properties. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 21-36% comprised of Juniper, shrub cover ranges from 9-20% cover primarily consisting of turbinella oak (*Quercus turbinella*). Perennial grass cover will vary depending on shrub and tree cover, having 16% average cover made up of the grama grasses: Sideoats grama (*Bouteloua curtipendula*) and hairy grama (*Bouteloua hirsuta*).

The data to describe existing vegetation was collected September 2016. This site, like others visited seemed to have just received monsoonal precipitation and grasses were in good vigor (Hibe-curly mesquite) at the time of sampling. Total perennial grass cover was 10%. Tobosa made up 7% of the grass cover on site. The remainder was curly mesquite and squirreltail. ET1 describes 9 different species of grass in this soil type. Diversity is low in comparison. Tobosa does well on clay soils. This is not completely indicative of the TEUI. The site selected is a new sampling site for TEUI 461 and a key area for this pasture.

The overall vegetation on this site best matches CT1.2 which lacks the presence of turbinella oak compared to CT1.1.

TEUI 372, South Pasture

TES Map Unit:	372	Acres in Pasture:	314
		% of Pasture:	5

Existing Ecological Community Type: **ET1**

Sampled Vegetation			Potential % Cover, Species of ET1		Notes shrub component is 11% similar, and the graminoid component is 82% similar to the described average.
Lifeform	% Cover	Primary Species:	% Cover	Primary Species:	
Shrub:	3	Opuntia	10	Acgr, Miacb, Opuntia	
Perennial Grass:	34	Bocu, Poab, Plmu	52	Bocu, Hibe, Poab, Plmu	

Rangeland Management Status: Satisfactory

Approximated Ecological Status:	High-Similarity for perennial grasses (82%)
Correlation to Parker 3-Step Data:	Parker Cluster data from Cluster 5 also located in this TEUI and pasture shown in Table 5.
Notes:	Vigor: Plmu good.



Photo 4 above: Key TEUI map unit in South pasture, TEUI 372, September 2016

Discussion: A key map unit in the South pasture, TEUI 372, is hot steppe grassland found on elevated and lowland plains located in the south and the western portion of this pasture. The vegetation for this map unit fits within the Semi-desert grassland PNVT. Soils are generally deep, very cobbly, silty clay loams. The site average is variable among the community types for shrub, and graminoid cover. Shrub cover ranges from 6-10% cover primarily consisting of *Acacia greggii*. Perennial grass cover will vary depending on shrub cover, having 34-52% cover made up of the grasses: Sideoats grama (*Bouteloua curtipendula*), Vine mesquite (*Panicum obtusum*) and tobosa (*Pleuraphis mutica*).

The data to describe existing vegetation was collected September 2016. The growing season in 2015 and 2016 had about average precipitation and grasses were in good vigor (Bocu-sideoats grama, Paob vine mesquite and Plmu-tobosa) at the time of sampling. This particular location looked to have not received as much rain as other areas. Sampling occurred post grazing, cows had come off in May, but there were some cows that had remained in the pasture.

Total perennial grass cover was 34%, 18% lower than ET1 total graminoid cover mean. Curly mesquite was missing from this sample site. ET1 averages 4 species of grass, which this site is most similar to. The site selected is a historic sampling site for TEUI 372.

TEUI 428, South Pasture

TES Map Unit:	428	Acres in Pasture:	1945
		% of Pasture:	29

Existing Ecological Community Type: **CTI.1**

<i>Sampled Vegetation</i>	<i>Potential % Cover, Species of ET1</i>	
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Lifeform	% Cover	Primary Species:	% Cover	Primary Species:	Notes: The tree component at this site is 0% similar to ETI PNC, shrub component is 11% similar, and the graminoid component is 51% similar to the described average.
Tree:	0		5	Juniperus spp.	
Shrub:	18	Erwr, Gusa, Qutu	22	Erwr, Gusa, Prve, Qutu,	
Perennial Grass:	27	Bocu, Elel	23	Bocu, Elel, Hibe	

Rangeland Management Status: Satisfactory

Approximated Ecological Status:	Mid-Similarity for perennial grasses (51%)
Correlation to Parker 3-Step Data:	Parker Cluster data from Cluster 43 also located in this TEUI and pasture shown in Table 5.
Notes:	Vigor: Bocu good,



Photo 5 above: Key TEUI map unit in South pasture, TEUI 428, September 2016

Discussion: A key map unit in the South pasture, TEUI 428, is pinon/juniper woodlands found on hills with moderate to steep slopes (9-42%) and make up the majority of usable acres in this pasture. The vegetation for this map unit fits within the Juniper Grassland PNVT. Soils are moderately deep, extremely stony, clay loam. Soils developed in basalt and have vertic (high shrink/swell) properties. The site is dominated by Juniperus species, and Shrubby buckwheat (*Eriogonum wrightii*) in the upper layers, and sideoats grama (*Bouteloua curtipendula*) and tobosa (*Pleuraphis mutica*) in the lower levels. Tree cover ranges from 1-7% comprised of Juniper, shrub cover ranges from 0-11% cover primarily consisting of turbinella oak (*Quercus turbinella*). Perennial grass cover will vary depending on shrub and tree cover ranges from 0-16%.

The data to describe existing vegetation was collected September 2016. The growing season in 2015 and 2016 had about average precipitation and grasses were in good vigor sideoats grama (Bocu) at the time of sampling. This particular location looked to have not received as much rain as other areas to the east and north. Sampling occurred post grazing, cows moved out in May, but there were some cows that had remained in the pasture.

Total perennial grass cover was 27%, 4% more than ET1 total graminoid cover average. With 9 grass species found on site diversity is good as ET describes 6 species. This site matches CT1.1 better than other described classifications.

TEUI 442, D1 East Pasture

TES Map Unit:	442	Acres in Pasture:	1740
		% of Pasture:	21

Existing Ecological Community Type: *matches a miscellaneous plot: C124*

Sampled Vegetation			Potential % Cover, Species of ET1		Notes: The tree component at this site is 24% similar to ET1 PNC, shrub component is 7% similar, and the graminoid component is 79% similar to the described average.
Lifeform	% Cover	Primary Species:	% Cover	Primary Species:	
Tree:	22	Juniper	3	Juniperus spp.	
Shrub:	1	Erwr, Rhtr	57	Cemo, Erwr, Qutu, Rhtr	
Perennial Grass:	13	Arista, Bocu, Bogr,	18	Arista, Bocu, Bogr,	

Rangeland Management Status: Satisfactory

Approximated Ecological Status:	High-Similarity for perennial grasses (79%)
Correlation to Parker 3-Step Data:	Parker Cluster data from Cluster 13 also located in this TEUI and pasture shown in Table 5.
Notes:	Vigor: Bogr Bocu good. Junipers are invading this TES unit, the site exceeds ET1 by 16%. This site was lacking ground cover. Slopes have pedestalled grasses with small gullies. Open areas w/o juniper contain more ground cover with minimal erosion.



Photo 6 above: Key TEUI map unit in D1 East pasture, TEUI 442, September 2016.

Discussion: A key map unit in the D1 East pasture, TEUI 442, is oak woodlands and grasslands found on hills with gentle slopes (0-15%) and make up the majority of usable acres it's located at the junction of two roads and is a good loafing ground for that pasture. The vegetation for this map unit fits within the Interior Chaparral PNVT. Soils are deep, gravelly to very cobbly, coarse sandy loam.

Soils are montmorillonitic, indicating high shrink/swell properties. The data to describe existing vegetation was collected September 2016. The growing season in 2015 and 2016 had about average precipitation and grasses were in good vigor sideoats grama (Bocu) at the time of sampling.

Grass cover was 13%, 5% less than ET1 average 18%. Six grass species were on site compared to 7 described for ET1. There are 3 classifications for ET1, this site does not fit into any of them. The lack of shrub cover doesn't match it with any of them and the high tree cover as well. It best matches with the miscellaneous plot c124.

TEUI 442, D1 East Pasture

TES Map Unit:	442	Acres in Pasture:	1740
		% of Pasture:	21

Existing Ecological Community Type: **ET1**

Sampled Vegetation			Potential % Cover, Species of ET1		Notes: The tree component at this site is 0% similar to ET1 PNC, shrub component is 10% similar, and the graminoid component is 72% similar to the described average.
Lifeform	% Cover	Primary Species:	% Cover	Primary Species:	
Tree:	0		3	Juniperus spp.	
Shrub:	54	Cemo, Erwr, Qutu, Rhtr	57	Cemo, Erwr, Qutu, Rhtr	
Perennial Grass:	13	Arista, Bocu, Bogr,	18	Arista, Bocu, Bogr,	

Rangeland Management Status: Satisfactory

Approximated Ecological Status:	High-Similarity for perennial grasses (72%)
Correlation to Parker 3-Step Data:	Parker Cluster data from Cluster 20 also located in this TEUI and pasture shown in Table 5.
Notes:	Vigor: Bogr, Bocu good. No Junipers were at sampling site. Good variety of shrubs alderleaf mahogany. Had black grama, and green sprangletop as well as lovegrass.



Photo 7 above: Key TEUI map unit in D1 East pasture, TEUI 442, September 2016 near C-20

Discussion: A key map unit in the D1 East pasture, TEUI 442, is oak woodlands and grasslands found on hills with gentle slopes (0-15%). This TEUI makes up the majority of the pasture used by livestock. It's located in the flats and goes up slope toward Mount Josh. The vegetation for this map unit fits within the Interior Chaparral PNVT. Soils are deep, gravelly to very cobbly, coarse sandy loam. Soils are montmorillonitic, indicating high shrink/swell properties. The data to describe existing vegetation was collected September 2016. Soils are deep, gravelly to very cobbly, coarse sandy loam. Soils are montmorillonitic, indicating high shrink/swell properties. The data to describe existing vegetation was collected September 2016. The growing season in 2015 and 2016 had about average precipitation and grasses were in good vigor sideoats grama (Bocu) at the time of sampling.

The site average is variable among the community types for tree, cover with ET2 not having any tree cover. Tree cover ranges from 0-6% comprised of Juniper, shrub cover ranges from 8-57% cover primarily consisting of turbinella oak (*Quercus turbinella*). Perennial grass cover will vary depending on shrub and tree cover and ranges from 5-40%.

The data to describe existing vegetation was collected September 2016. Grasses blue grama (Bogr), and sideoats grama (Bocu) were in good vigor at the time of sampling. Nearby Josh tank was full. Grass cover was 13%, 5% less than ET1 average 18%. Eight grass species were on site compared to 7 described for ET1. Shrub cover was on line with 54% and tree cover was below ET1 average with 0% compared to 3%.

TEUI 430, Sycamore Exclosure Pasture

TES Map Unit:	430	Acres in Pasture:	1653
		% of Pasture:	30

Existing Ecological Community Type: **CTI.3**

Sampled Vegetation			Potential % Cover, Species of ET1		Notes: The tree component at this site is 52% similar to ET1 PNC, shrub component is 73% similar, and the graminoid component is 20% similar to the described average.
Lifeform	% Cover	Primary Species:	% Cover	Primary Species:	
Tree:	8	Juniper,	22	Juniperus spp. Pied,	
Shrub:	15	Erwr, Qutu, Gusa	23	Cegr, Erwr, Gusa, Qutu	
Perennial Grass:	27	Hibe,, Bocu,	11	Bocu, Hibe, Pofe	

Rangeland Management Status: Unsatisfactory

Approximated Ecological Status:	Low-Similarity for perennial grasses (20%)
Correlation to Parker 3-Step Data:	Parker Cluster data from Cluster C-41 also located in this TEUI and pasture shown in Table 5.
Notes:	Vigor: Hibe, & Bocu good. Some sign of cattle use in the exclosure

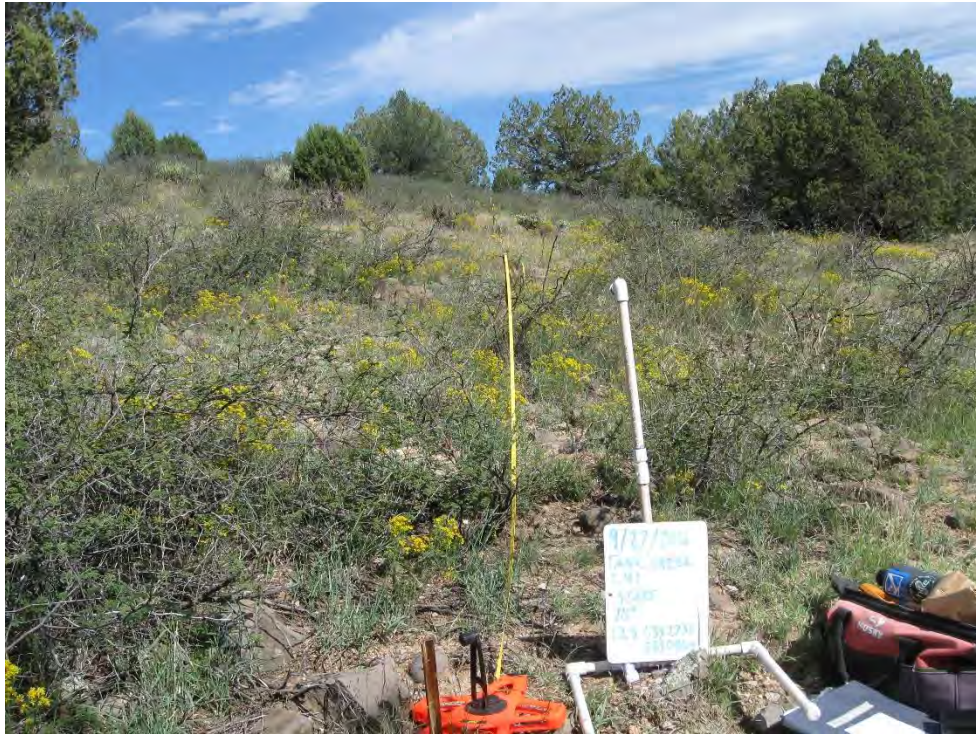


Photo 8 above: Key TEUI map unit in Sycamore Exclosure pasture, TEUI 430, September 2016

Discussion: A key map unit in the Sycamore Exclosure pasture, TEUI 430, is pinon juniper woodlands on elevated plains with steep slopes (40-120%). This TEUI makes up the north and south side of Sycamore creek and occurs in the eastern portion of this pasture. The vegetation for this map unit fits within the Piñon-Juniper Evergreen Shrub PNVT. Soils are shallow to deep. Texture has high shrink swell properties. The site is highly variable with vegetation, due to the large range in elevation for this TES. Tree cover ranges from 6-27% comprised of Juniper, and piñon pine, shrub cover ranges from 23-33% cover primarily consisting of turbinella oak (*Quercus turbinella*). Perennial grass cover will vary depending on shrub and tree cover and ranges from 7-31%.

The data to describe existing vegetation was collected September 2016. The growing season in 2015 and 2016 had about average precipitation. There were signs of livestock in this pasture at the time of sampling however little utilization was seen. Grasses; curly mesquite (Hibe) and Three-awn (Aristida species) were in good vigor at the time of sampling.

Grass cover is over double and shrub and tree cover were far below of that described for ET1. Five grass species are on site compared to ET1 average of 8.

TEUI 448, Tonto Pasture

TES Map Unit:	448	Acres in Pasture:	1981
		% of Pasture:	56

Existing Ecological Community Type: **ET1**

Sampled Vegetation			Potential % Cover, Species of ET1		Notes: Light use 0-5%, livestock just moved into pasture, good diversity, and area responded well one month ago it was dry and
Lifeform	% Cover	Primary Species:	% Cover	Primary Species:	
Tree:	0		0		
Shrub:	21	Arpu5, Cemo, Qutu2, Rhtr	52	Arpu5, Cemo, Qutu2, Rhtr	

Perennial Grass:	8	Bocu, Bogr	9	Bocu, Bogr, Koma, Pofe	<i>plants were stressed, now green and growing.</i>
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Rangeland Management Status: Satisfactory

Approximated Ecological Status:	Mid-Similarity for perennial grasses (41%)
Correlation to Parker 3-Step Data:	Parker Cluster data from Cluster C-6 also located in this TEUI and pasture shown in Table 5.
Notes:	Vigor: excellent on grasses



Photo 9 above: Key TEUI map unit in Tonto pasture, TEUI 448, August 2016

Discussion: A key map unit in the Tonto pasture, TEUI 448, is chaparral found on elevated hills located between Mount Josh and Tonto Mountain with slopes averaging 19% (0-40%). The vegetation for this map unit fits within the Interior Chaparral PNVT. Soils are shallow to very shallow, very gravelly to very cobbly. Texture is coarse sandy loam to loamy coarse sand from granitic parent material. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 0-13% comprised of Juniper, shrub cover ranges from 52-81% cover primarily consisting of turbinella oak (*Quercus turbinella*). Perennial grass cover will vary depending on shrub and tree cover and ranges from 0-9%.

TEUI 448, D1 West Pasture

TES Map Unit:	448	Acres in Pasture:	2318
		% of Pasture:	29

Existing Ecological Community Type: **ET1**

Sampled Vegetation			Potential % Cover, Species of ET1		Notes: Very little grass diversity due to heavy chaparral cover. Vigor was poor on the grasses. Need vegetation treatments to help the grass recover.
Lifeform	% Cover	Primary Species:	% Cover	Primary Species:	
Tree:	0		0		
Shrub:	26	Arpu5, Cemo, Qutu2, Rhtr	52	Arpu5, Cemo, Qutu2, Rhtr	
Perennial Grass:	1	Bocu,	9	Bocu, Bogr, Koma, Pofe	

Rangeland Management Status: Unsatisfactory

Approximated Ecological Status:	Low-Similarity for perennial grasses (1%)
Correlation to Parker 3-Step Data:	None
Notes:	Vigor: poor. Very little grass diversity. Need to do some work on cutting back the brush.



Photo 10 above: Key TEUI map unit in D1 West pasture, TEUI 448, September 2016

Discussion: A key map unit in the D1 West pasture, TEUI 448, is chaparral found on elevated hills with slopes averaging 19% (0-40%). The vegetation for this map unit fits within the Interior Chaparral PNVT. Soils are shallow to very shallow, very gravelly to very cobbly. Texture is coarse sandy loam to loamy coarse sand from granitic parent material. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 0-13% comprised of Juniper, shrub cover ranges from 52-81% cover primarily consisting of turbinella oak (*Quercus turbinella*). Perennial grass cover will vary depending on shrub and tree cover and ranges from 0-9%.

The data to describe existing vegetation was collected September 2016. The growing season in 2015 and 2016 had about average precipitation. Grasses were in poor vigor at the time of sampling. Total perennial grass cover was <1%. Three species of grass were on site compared to 6 for ET1. Brush is

crowding out the grass species. The site selected is a historic sampling site for TEUI 490 in this pasture.

TEUI 448, Headquarters Pasture

TES Map Unit:	448	Acres in Pasture:	125
		% of Pasture:	34

Existing Ecological Community Type: *CTI.1*

Sampled Vegetation			Potential % Cover, Species of ETI		Notes: Very poor grass diversity, vigor poor on the grasses. The Shrub component is 83% similar to ETI PNC and the graminoid is 40% similar to the described average.
Lifeform	% Cover	Primary Species:	% Cover	Primary Species:	
Tree:	1	Juniper species	0		
Shrub:	46	Arpu5, Cemo, Qutu2, Rhtr	52	Arpu5, Cemo, Qutu2, Rhtr	
Perennial Grass:	8	Bocu,	9	Bocu, Bogr, Koma, Pofe	

Rangeland Management Status: Satisfactory

Approximated Ecological Status:	Mid-Similarity for perennial grasses (40%)
Correlation to Parker 3-Step Data:	None
Notes:	Vigor was poor



Photo 11 above: Key TEUI map unit in Headquarters pasture, TEUI 448, September 2016

Discussion: A key map unit in the D1 West pasture, TEUI 448, is chaparral found on elevated hills with slopes averaging 19% (0-40%). The vegetation for this map unit fits within the Interior Chaparral PNV. Soils are shallow to very shallow, very gravelly to very cobbly. Texture is coarse sandy loam to loamy coarse sand from granitic parent material. The site average is variable among the community types for tree, shrub, and graminoid cover. Tree cover ranges from 0-13% comprised of Juniper, shrub cover ranges from 52-81% cover primarily consisting of turbinella oak (*Quercus*

turbinella). Perennial grass cover will vary depending on shrub and tree cover and ranges from 0-9%.

The data to describe existing vegetation was collected September 2016. The growing season in 2015 and 2016 had about average precipitation. Grasses were in poor sideoats grama (*Bocu*) and blue grama (*Bogr*) vigor at the time of sampling. Total perennial grass cover was 8%, just 1% less than ET1 total graminoid cover mean. Five species of grass were on site compared to 6 for ET1.

Summary of Desired Vegetation Status and Rangeland Management Status by Pasture on the Tank Creek Allotment

Desired Vegetation Status and Rangeland Management Status (RMS) for all key TEUI map units selected within the pastures on this allotment are shown in Table 8 below. TEUI map unit 372 in South pasture, and D1 East pasture high similarity rating for grasses and stable trend. Key areas in South, Tonto and Headquarters all received mid similarity ratings for grasses, and a stable trend. These factors lead to a determination of satisfactory Rangeland Management Status (RMS) for all but TEUI 461 in the Sycamore/Dougherty Pasture, TEUI 448 in D1 West pasture, and TEUI 427 in Stevens and TEUI 430 in Sycamore enclosure.

Table 5: Desired Vegetation Status and Rangeland Management Status by Pasture

Pasture	TEUI Map Unit	Desired Vegetation Status	Trend	Rangeland Management Status
South	372	High similarity for grasses	C40 Stable	Satisfactory
	428	Mid similarity for grasses	C43 Stable	Satisfactory
D1 East	425	High similarity for grasses	C49 Stable	Satisfactory
	442	High similarity for grasses	C13, C20 Stable	Satisfactory
Sycamore/Dougherty	461	Low similarity for grasses	C60 Downward	Unsatisfactory
D1 West	448	Low Similarity for grasses	C25 Stable	Unsatisfactory
Stevens	427	Low similarity for grasses	C35 Stable	Unsatisfactory
Sycamore Enclosure	430	Low similarity for grasses	C41 Stable	Unsatisfactory
Tonto	448	Mid similarity for grasses	C6 Stable	Satisfactory
Headquarters	448	Mid similarity for grasses	C27 Stable	Satisfactory

Invasive Plant Species

Noxious weed surveys have not been conducted specifically on these allotments. Isolated occurrence of salt cedar is known to be present in some drainages. Treatment of noxious weeds is addressed in the Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds, Coconino, Kaibab, and Prescott National Forests within Coconino, Gila, Mohave, and Yavapai Counties, Arizona. Possible treatment of known weed populations will be managed under the PNF’s noxious weeds program and will not be further addressed in this proposal.

Direct & Indirect Effects on Vegetation

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

Alternative 1

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

Climate and rainfall will have the most significant impact on the cover and vigor of perennial grasses when grazing is properly managed. A study describing 30 years of weather influence on ungrazed areas in New Mexico found that sideoats grama reduced in canopy cover by almost half in 2007 as compared to 1977 in response to decreased precipitation (Moir 2011). Research by Molinar et al. (2011) showed that during a 38-year study period on Chihuahuan desert rangelands, managed livestock grazing and excluded livestock grazing had the same long-term effects on change in plant frequency and rangeland ecological condition when use levels were kept at conservative or moderate rates in most years.

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

Tank Creek Allotment

At the key TEUI inventory sites on the allotment, the existing canopy cover and species composition is found to be meeting desired condition for vegetation in all pastures except TEUI 461 in the Sycamore/Dougherty Pasture, TEUI 448 in D1 West pasture, TEUI 427 in Stevens and TEUI 430 in Sycamore enclosure. With grazing management that includes integration of rest, pasture deferment to allow grasses to reproduce, and adherence to allowable use levels, the desired conditions for vegetation should be sustainable. Adequate precipitation is essential to achieving optimal plant vigor and production. The proposed new water sources and fences will aid in proper livestock distribution so that under-utilized areas will take away some of the grazing pressure from traditional congregation areas.

The estimated grazing capacity on the Tank Creek Allotment is based on these sources: actual use records compiled from 2007 to 2016 (shown in Table 4) and application of calculations based upon

Holechek (1988) and shown in Appendix 2. These sources indicate that the allotment would support a range of livestock numbers based on fluctuating conditions.

Areas needing improvement in vegetation condition and/or soil condition are being managed to allow for periods of rest or deferment and/or incidental use levels of 0-30% (Sycamore/Dougherty Pasture TEUI 461, D1 West Pasture TEUI 448, and Stevens Pasture 427, and through reinforcement of the enclosure (Sycamore Enclosure Pasture TEUI 430). Incidental use will allow plant biomass (>70%) to be retained on site to protect and be incorporated into the soil to improve organic matter and infiltration of water. Integrating seasonal deferment allows plants to fully mature and full rest will allow that vegetative material to remain on site until new growth occurs.

The actual use records for the allotment for the last five years shows a range of stocking levels from 4620 Animal-Months (AMs) in 2012, and up to 4860 (AMs) in 2016. This upper number is equivalent to 405 adult cattle year long. Averaging the last five years the AMs are 4716, which is 393 adult cattle year long. 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. Inspection records show occasional instances of use above standards, but there is no indication of repeated overuse causing damage to plant physiology.

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 ⁷ calculated at 405 (4924 AUM) when 45% of the available forage estimate is allocated to livestock. 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.

As with any capacity estimate, monitoring over time will be necessary to validate the proposed stocking rate. The adaptive management approach to grazing management seeks to balance stocking levels with forage production on a yearly basis. This allows for stocking in response to changes in forage production that naturally occur as a result of fluctuations in precipitation levels and seasonality. The maximum level of stocking (405 head yearlong) that is proposed may not be achievable in all years, but the actual use records show that the allotment has been stocked on average at 96% of this upper limit in the last 5 years. The addition of three more pastures in a deferred rotation pasture system with Alternative 1, will allow for plant recovery 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 and cool-season grasses such as New Mexico feathergrass, three-awns and squirreltail. Compliance with allowable use levels should provide for maintaining and improving the cool-season grass species that are present, and maintain the warm season grass species diversity.

⁷ Animal Units and Animal Months used in these calculations are based upon the Society for Range Management (1974) definition: An animal unit is one mature (1000lb) cow. This animal would be expected to consume 2.6% of its body weight per day or 26 lbs.

Alternative 2 – No Action/No Grazing Alternative

Under the No-Action Alternative, all cattle grazing within the allotment would be phased out over a 2-year period. Livestock impacts on vegetation would be removed. Only incidental wildlife grazing would occur sporadically at light intensities. The removal of grazing may allow for slightly more rapid improvement than alternative 1 in vegetation cover, vigor, and composition in areas not influenced by woody plant canopy. Where shrub or tree cover is currently greater than would be expected for the potential plant community, there will likely be limited to no improvement in perennial grass cover unless the tree and/or shrub canopy is removed by fire or vegetation treatments at a later date. This stable state of shrub dominance is expected to persist even in the absence of grazing. Those areas currently considered in satisfactory condition would remain as such under the no grazing alternative. More residual biomass would be retained under this alternative, which has been demonstrated to improve water infiltration and enhance nutrient cycling, thus promoting vigorous plant growth.

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

Range Improvement Effects Alternative 1:

Structural Range Improvements: The construction of new water sources can result in the removal of vegetation in areas up to ¼-acre each. Water sources will draw livestock to use forage within proximity of the water source. Grazing impacts may be locally heavy within ¼-mile of a water source. Rest and rotation strategies for pastures will help forage plants to recover after use. The new water sources will provide for dispersion of the grazing herd into under-utilized areas. Fence construction should not impact existing vegetation other than in a limited, small area along the fence corridor. Woody vegetation or shrubs may be thinned with hand tools along the fence line. Access to existing improvements for maintenance and new improvements by overland travel with machinery will damage some herbaceous plants in a limited area. These plants should recover quickly once precipitation occurs. No new roads will be developed to construct new improvements. Travel ways to access new improvements will be surveyed for cultural properties to avoid impacts during construction. Employing Best Management Practices (BMPs) that limit travel to when soils are dry should mitigate long-term effects to soils and retain the productive potential for vegetation.

Range Improvement Effects Alternative 2:

No new structural range improvements would be constructed under this alternative. If grazing is eliminated, some existing range improvements may be removed and this could cause some ground-disturbance. Archeological surveys would be needed prior to any ground disturbing activity so that no cultural resources were impacted from the activity.

Cumulative Effects on Range Vegetation Resources

The cumulative effects analysis area considered for effects on range/vegetation resources consists of the two allotments that comprise the project area. The past and present activities and events that have affected the vegetation include livestock and wildlife grazing, past wildfires,

prescribed fire, past vegetation management, range improvement construction, recreational uses, and roads. These activities may affect vegetation in ways similar to livestock grazing through removal of herbaceous plant canopy cover. Indirectly these activities may affect vegetative productivity by causing soil compaction that leads to reduced water infiltration and then to reduced plant growth. Removal of vegetation can expose the soil to erosion and thereby reduce long-term productive potential for vegetation. Site visits have shown that the impacts of some past prescribed fire or juniper thinning activities are evident by the reduced shrub or tree cover from site potential. Shrub and tree cover will increase to site potential levels over time. It is desirable to maintain various seral stages in woodlands and shrub lands to create wildlife habitat complexity. Site visits show that impacts from recreational activities on the allotments are limited to small, localized areas consisting of dispersed camping spots along main roads. The vegetation impacts created through livestock grazing, improvement construction, and adaptive management as described for alternative 1, when added to the other past, present and future activities do not together accumulate to levels that are considered to be significant for the vegetative resources, nor are they expected to lead to irreversible effects to vegetation.

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

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

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

1.8 What are the Impacts to Soils and Watersheds?

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

Existing Condition:

Soil and vegetation field data was collected by the Prescott National Forest Rangeland Core Team which consists of the rangeland management specialist, ecologist, and soil scientist. Locations for data collection were described within the vegetation section by TEUI soil map unit. Soil condition is an evaluation of soil quality or the capacity of the soil to function within ecosystem limitations to sustain biologic productivity, maintain environmental quality, and promote plant and animal health (USDA FS 2013). The soil condition rating procedure evaluates soil quality based on an interpretation of factors that affect three primary soil functions. The primary soil functions evaluated are soil stability, soil hydrology, and nutrient cycling (USDA FS 1999). These functions are interrelated. Field measurements were collected to determine ground cover, spatial distribution of bare spaces, soil bulk density (a measure that will influence water infiltration), as well as a checklist of qualitative soil attributes.

There are a myriad of elements and management activities that influence and contribute to soil conditions. Past and present management actions and processes that contribute to existing soil conditions are described in the Tank Creek Grazing Allotment; Soil and Watershed Cumulative Effects report in the project record. The Tank Creek Grazing Allotment Soil Analysis report contains the detailed disclosure of existing condition and expected project outcomes and is found in the project record. Recognizing there are many influencing factors resulting in existing soil conditions, this analysis focuses on how livestock grazing contributes to soil function. The following narratives display existing soil condition for each representative map unit that was analyzed by allotment.

Tank Creek Allotment

Table 6. Current soil condition on the Tank Creek Allotment key soil map units

Pasture	TEUI	Pasture Acres	Existing Soil Condition
South	372	314	Satisfactory
	428	2199	Satisfactory
D1 East	425	2856	Impaired
	442	1946	Unsatisfactory
Sycamore/Doughert	461	3729	Impaired
Stevens	427	2779	Impaired
Sycamore Enclosure	430	2262	Satisfactory
D1 West Tonto Headquarters	448	6383	Satisfactory

The desired condition for soil is to be maintaining all necessary soil functions and be rated in satisfactory condition. Desired condition is being met in 6 of the 8 main pastures and is being met in some key areas of the Granites and Spider Pastures. Those key areas needing improvement are further described here.

South Pasture, TEUI 372: Soils are in satisfactory condition. Graminoid and shrub cover is similar or greater than TEUI potential and well distributed across the landscape. Compaction is present as indicated by soil structure. The basal cover from graminoid species is decreasing overland flow, promoting infiltration, and providing soil stability. In addition the shrub component provides litter production for soil stabilization and nutrient cycling. Litter associated with chaparral is thick and

results in the formation of granular soil structure that promotes infiltration and water holding capacity. The management objective is to improve vegetative ground cover diversity to maintain satisfactory soil conditions with standard rangeland management practices.

South Pasture, TEUI 428: Soils are in satisfactory condition. Graminoid and shrub cover is similar to TEUI potential; however, not well distributed across the landscape. Compaction is present as indicated by soil structure. This combined with lower vegetative ground cover levels within the interspace can elevate run-off and create soil instability. However, the basal cover from graminoid species is decreasing overland flow, promoting infiltration, and providing soil stability. In addition the shrub component provides litter production for soil stabilization and nutrient cycling. Litter associated with chaparral is thick and results in the formation of granular soil structure that promotes infiltration and water holding capacity. The management objective is to improve vegetative ground cover diversity to maintain satisfactory soil conditions with standard rangeland management practices.

D1 East Pasture, TEUI 425: Soils are in an impaired condition. Compaction is present. However, an increase in the basal cover from graminoid species can decrease overland flow, promoting infiltration, and providing soil stability. In addition the shrub component provides litter production for soil stabilization and nutrient cycling. Litter associated with chaparral is thick and results in the formation of granular soil structure that promotes infiltration and water holding capacity. The vegetative component was well established and will help in lowering the bulk density of the area soils. The soil component is at an impaired condition but with the established vegetation component, it is on an upward trend. The management objective is to improve vegetative ground cover diversity to improve soil conditions to a satisfactory level by integrating rest through deferment and control water use to alleviate concentrated use and allow recovery. Prescribe incidental use (lower end of light use) to promote biomass retention and subsequent litter development.

D1 East Pasture, TEUI 442: Soils surrounding cluster 13 are in unsatisfactory condition. Sampled location has unfavorable vegetative spatial distribution. Soil compaction is occurring as shown by soil structure. The lack of vegetative cover, in some areas, and high bare soil decreases infiltration, accelerates soil loss and negative impacts nutrient cycling. Graminoid cover is sparse/absent, organic matter is lacking, sheet erosion is extensive. Soils surrounding Cluster 20 are satisfactory. The management objective is to improve vegetative ground cover diversity to improve soil conditions to a satisfactory level with by integrating rest through deferment and control water use to alleviate concentrated use, compaction and allow recovery. Prescribe incidental use (lower end of light use) to promote biomass retention and subsequent litter development.

Sycamore/Dougherty Pasture TEUI 461: Soils are in an impaired condition. Graminoid and shrub cover is less than TEUI potential and not distributed across the landscape. Compaction is present. This combined with lower vegetative ground cover levels within the interspace can elevate run-off and create soil instability. However, an increase in the basal cover from graminoid species can decrease overland flow, promoting infiltration, and providing soil stability. In addition the shrub component provides litter production for soil stabilization and nutrient cycling. Litter associated with chaparral is thick and results in the formation of granular soil structure that promotes infiltration and water holding capacity. The management objective is to improve vegetative ground cover complexity to improve soil conditions to a satisfactory level with standard rangeland

management practices. In areas where grasses are present and persistent, treatment of the area juniper component is advised. Lop and scatter and retain a high amount of the litter.

Stevens Pasture TEUI 427: Soils are in impaired soil condition. The graminoid vegetative layers are absent or sparse and high levels of bare soil are present. Gap vegetation spatial distribution is unfavorable resulting in widespread continuous overland erosion patterns across the landscape. In some areas, graminoid cover is present but is providing minimal soil protection. The soil hydrologic processes, stability, and nutrient cycling is non-functional. Extensive sheet erosion is widespread and connected into defined rills, pedestalling of vegetation, partial loss of the A-horizon, and erosion pavement development. Surface and internal organic matter is lacking resulting in minimal to no nutrient cycling. The loss of the A-horizon is amplifying the soils inability to infiltrate water and accelerates run-off and run-on to adjacent vegetative patches that can have a negative impact to soil productivity (Ludwig 2005, Hart 1993). The management objective is to improve vegetative ground cover diversity to improve soil conditions to a satisfactory level through incidental use and integrated rest.

Sycamore Enclosure Pasture TEUI 430: Soils are in satisfactory condition. Graminoid and shrub cover is similar or greater than TEUI potential and well distributed across the landscape. However, bare soil, rill and gully erosion are present on the portions of toe-slopes of this TEUI. Compacted soil was observed on the toe slope. The basal cover from graminoid species is decreasing overland flow, promoting infiltration, and providing soil stability. In addition the shrub component provides litter production for soil stabilization and nutrient cycling. Litter associated with chaparral is thick and results in the formation of granular soil structure that promotes infiltration and water holding capacity. The management objective is to improve vegetative ground cover to maintain satisfactory soil conditions through reinforcement of the enclosure within this area. In areas where grasses are present and persistent, treatment of juniper is advised through a lop/scatter method and retain a high amount of the litter. Implement gully stabilization where gullies are present.

D1 West, Tonto, and Headquarters Pastures TEUI 448: Soil sampled areas were determined to be satisfactory. Graminoid and shrub cover is similar or greater than TEUI potential and well distributed across the landscape. However, bare soil surrounding cluster 25 in Tonto is high. Slight compaction is present as indicated by soil structure. This combined with lower vegetative ground cover levels within the interspace can elevate run-off and create soil instability. However, the basal cover from graminoid species is decreasing overland flow, promoting infiltration, and providing soil stability. In addition the shrub component provides litter production for soil stabilization and nutrient cycling. Litter associated with chaparral is thick and results in the formation of granular soil structure that promotes infiltration and water holding capacity. The management objective is to improve vegetative ground cover complexity to improve soil conditions with standard rangeland management practices.

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.

Tank Creek Allotment

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

Table 7. Direct and indirect effects of grazing versus no grazing to soil condition on the Tank Creek Allotment.

Pasture	TEUI	Existing Soil Condition	Alternative 1: Grazing	Alternative 2: No
South	372	Satisfactory	Satisfactory	Satisfactory
South	428	Satisfactory	Satisfactory	Satisfactory
D1 East	425	Impaired	Satisfactory	Satisfactory
D1 East	442	Unsatisfactory	Satisfactory	Satisfactory
Sycamore/ Dougherty	461	Impaired	Impaired	Impaired
Stevens	427	Impaired	Satisfactory	Satisfactory
Sycamore Enclosure	430	Satisfactory	Satisfactory	Satisfactory
D1 West Tonto Headquarter s	448	Satisfactory	Satisfactory	Satisfactory
		Satisfactory	Satisfactory	Satisfactory
		Satisfactory	Satisfactory	Satisfactory

Alternative 1: Grazing

South Pasture – 372 and 428 are in satisfactory soil condition. TEUI 372 is within the Semi-desert grassland PNVT and TEUI 428 is within the juniper grassland PNVT. The soil condition would be maintained. The basal cover from graminoid species is decreasing overland flow, promoting infiltration, and providing soil stability. In addition the shrub component provides litter production for soil stabilization and nutrient cycling. Litter associated with chaparral is thick and results in the formation of granular soil structure that promotes infiltration and water holding capacity. The standard rangeland management practices proposed would continue to maintain residual graminoid cover and maintain the satisfactory soil condition.

D1 East Pasture – 425 and 442 is within the Piñon-Juniper Shrub, Chaparral, and Interior Chaparral PNVTS which supports high levels of shrub cover. The soil condition in 425 would remain in satisfactory condition and the soil condition in 442 would be expected to move towards satisfactory condition. The dense shrub cover would continue to provide high litter levels for soil stability protection, favorable soil structure and infiltration, and nutrient cycling. The prescribed utilization level (lower end of light use would promote biomass retention and subsequent litter development while alleviating concentrated use and compaction. Utilization guidelines would continue to maintain residual graminoid cover within the shrub interspaces for additional soil protection. Soil condition would move towards or be maintained in satisfactory condition.

Sycamore/Dougherty Pasture – 461 is within a Pinon-Juniper Woodland PNVT. This site was selected to collect initial data in this TEUI prior to vegetation treatment. This site would be monitored in the future when vegetation treatment occurs to monitor the changes in the vegetation. The prescribed utilization level and water developments would promote biomass

retention and subsequent litter development while alleviating concentrated use and compaction. Utilization guidelines would improve residual graminoid cover within the interspaces for additional soil protection. However, these are young soils that will have interspatial growth between rock but will not produce good vegetation overall. Soil condition would remain impaired and could move very slowly (over decades) towards satisfactory condition.

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

Sycamore Enclosure Pasture – 430 is in satisfactory soil condition. TEUI 430 is within the Semi-desert grassland PNVT and TEUI 428 is within the juniper grassland PNVT. The soil condition would be maintained. The basal cover from graminoid species is decreasing overland flow, promoting infiltration, and providing soil stability. In addition the shrub component provides litter production for soil stabilization and nutrient cycling. Litter associated with chaparral is thick and results in the formation of granular soil structure that promotes infiltration and water holding capacity. The standard rangeland management practices proposed would continue to maintain residual graminoid cover and maintain the satisfactory soil condition.

D1 West, Tonto, & Headquarters Pastures - 448 are within the Interior Chaparral PNVT which support high levels of shrub cover. The prescribed utilization level and water/fence improvements would promote biomass retention and subsequent litter development while alleviating concentrated use and compaction. Utilization guidelines would improve residual graminoid cover within the interspaces for additional soil protection. Soil condition would be expected to remain in satisfactory condition.

Alternative 2: No Grazing

South Pasture – 372 and 428 are in satisfactory soil condition. TEUI 372 is within the Semi-desert grassland PNVT and TEUI 428 is within the juniper grassland PNVT. The soil condition would be maintained. The basal cover from graminoid species is decreasing overland flow, promoting infiltration, and providing soil stability. In addition the shrub component provides litter production for soil stabilization and nutrient cycling. Litter associated with chaparral is thick and results in the formation of granular soil structure that promotes infiltration and water holding capacity. The standard rangeland management practices proposed would continue to maintain residual graminoid cover and maintain the satisfactory soil condition.

D1 East Pasture – 425 and 442 is within the Piñon-Juniper Shrub, Chaparral, and Interior Chaparral PNVTs which supports high levels of shrub cover. The soil condition in 425 would remain in satisfactory condition and the soil condition in 442 would be expected to move towards satisfactory condition. The dense shrub cover would continue to provide high litter levels for soil stability protection, favorable soil structure and infiltration, and nutrient cycling. The prescribed utilization level (lower end of light use would promote biomass retention and subsequent litter development while alleviating concentrated use and compaction. Utilization guidelines would continue to

maintain residual graminoid cover within the shrub interspaces for additional soil protection. Soil condition would move towards or be maintained in satisfactory condition.

Sycamore/Dougherty Pasture – 461 is within a Pinon-Juniper Woodland PNVT. This site was selected to collect initial data in this TEUI prior to vegetation treatment. This site would be monitored in the future when vegetation treatment occurs to monitor the changes in the vegetation. The prescribed utilization level and water developments would promote biomass retention and subsequent litter development while alleviating concentrated use and compaction. Utilization guidelines would improve residual graminoid cover within the interspaces for additional soil protection. Soil condition would remain impaired for decades though would move slowly towards satisfactory condition.

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

Sycamore Enclosure Pasture – 430 is in satisfactory soil condition. TEUI 430 is within the Semi-desert grassland PNVT and TEUI 428 is within the juniper grassland PNVT. The soil condition would be maintained. The basal cover from graminoid species is decreasing overland flow, promoting infiltration, and providing soil stability. In addition the shrub component provides litter production for soil stabilization and nutrient cycling. Litter associated with chaparral is thick and results in the formation of granular soil structure that promotes infiltration and water holding capacity. The standard rangeland management practices proposed would continue to maintain residual graminoid cover and maintain the satisfactory soil condition.

D1 West, Tonto, & Headquarters Pastures - 448 are within the Interior Chaparral PNVT which support high levels of shrub cover. The prescribed utilization level and water/fence improvements would promote biomass retention and subsequent litter development while alleviating concentrated use and compaction. Utilization guidelines would improve residual graminoid cover within the interspaces for additional soil protection. Soil condition would be expected to remain in satisfactory condition.

Structural Range Improvements

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

Alternative 1: Grazing

The installation and maintenance of range improvements has the potential to decrease soil conditions, but these effects would be largely mitigated by implementing Best Management Practices. The disturbance area would be limited in scope as compared to the acreage of the allotment as a whole. Range improvement, soil and water conservation practices, identified as BMPs, provide guidance on site evaluation, site preparation, and erosion control measures as a means to minimize soil damage to productivity.

Alternative 2: No Grazing.

There would be no impacts to the soil resources from range improvement installation and maintenance because livestock grazing would not occur. However, the removal of range improvements has the potential to negatively impact the soil resources but these impacts would be largely mitigated by implementing Best Management Practices. Range improvement soil and water conservation practices, identified in the BMPs, provide guidance on site evaluation, site preparation, and erosion control measures as a means to minimize soil damage to productivity.

Non-structural Range Improvements

Alternative 1: Grazing

Vegetation treatments such as those proposed (prescribed burning, mechanical removal of shrubs and juniper, maintenance burns and mechanical treatments, and managed fire) all have the potential to improve soil condition. The initial disturbance would be minimal in scope as compared to the acreage of the allotment as a whole and the long term benefits would outweigh the short term affects. Livestock grazing may be deferred after the initial treatment depending on the situation to provide for sufficient recovery.

Alternative 2: No Grazing.

Vegetation treatments such as those proposed (prescribed burning, mechanical treatments, managed wildfire, hand thinning, and maintenance burns) all have the potential to improve soil condition. The initial disturbance would be minimal in scope as compared to the acreage of the allotment as a whole and the long term benefits would outweigh the short term affects. Livestock grazing would not occur.

Existing Condition of Watersheds

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

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

- Class 1 = Functioning Properly (Good). Class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

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

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

Table 8. Project area watersheds, along with condition class and total watershed acreage

5th level HUC Watershed	6th level HUC Sub-Watershed	Condition Class	Total watershed acres	Forest Service Sub-Watershed Acres	Tank Creek Allotment Acres
Kirkland Creek	Tonto Wash	At Risk	27,194	17,560	7,012
	Cottonwood Canyon-Kirkland Creek	Properly	27,874	2,231	78
Sycamore Creek	Upper Sycamore Creek	At Risk	18,077	17,181	13,599
	Weed Canyon	At Risk	12,796	12,420	12,649
	Tank Creek	At Risk	6,963	4,946	4,685
	Smith Canyon	Properly	28,188	25,791	928
	Cottonwood Canyon	At Risk	35,825	32,491	132
Williamson Valley Wash	Strickland Wash	At Risk	15216	11420	1285

Cumulative Effects on Soil Resources and Watershed Condition

Existing conditions and projected direct/indirect effects associated with the soil resources were used in conjunction with the Watershed Condition Classification indicator score to evaluate the cumulative effects of this project upon soil and watershed resources. Past, present, and foreseeable future action(s), regardless of what entity is responsible for the action(s) where considered when evaluating the watershed condition and their associated attributes. Activities that could have additive effects to project actions include vegetation treatments, wildfire, prescribed burning, roads, and grazing. In conclusion, the activities affiliated with the Tank Creek Allotment would not significantly add to the soil and watershed cumulative effects to the watershed indicators because of the resource protection features and implementation of soil and water conservation practices (BMPs); and the large size of the watershed compared to the small size of the allotment.

Methods to decrease high woody cover in order to improve vegetation structural diversity, increase vegetation ground cover, and improve soil conditions and wildlife habitat, include mechanical thinning and fuelwood treatment. Some mechanical treatments and fuelwood practices can cause soil disturbance through soil compaction and displacement, mechanically disturb the soil organic

layer, and expose unfavorable subsurface soil properties. This can result in difficulty in re-establishing herbaceous and vegetative ground cover. Current projects and future plans to implement vegetation treatment on the Prescott NF would use hand cutting or tree shears, both of which would minimally disrupt the soil surface. Present and future fuelwood treatments would integrate Best Management Practices to ensure minimal damage to the soil resources. Slash associated with all treatments is retained on the site to stabilize soils and encourage herbaceous cover to mitigate the potential impact of treatment. These treatments may subsequently be maintained through prescribed burning.

Wildland fire has the potential to temporarily pose a threat to watershed resources by decreasing vegetative ground cover levels, potentially causing hydrophobic soil surface conditions, and accelerating run-off, erosion rates, and sediment production. The Burned Area Emergency Response (BAER) program is initiated on all wildfires 500 acres or larger and applies any necessary soil and water conservation treatments to mitigate the threat of accelerated soil loss, water quality/quantity impairment, and loss of life.

Prescribed burning has the potential to temporarily decrease vegetation productivity and increase run-off, soil loss, and sedimentation. However, burn prescriptions occur during favorable burn periods (e.g., favorable weather conditions and planned burn blocks resulting in favorable fire behavior) and Best Management Practices are implemented to minimize negative impacts. Prescribed fire can also lead to the improvement of vegetation, soil, and watershed resources by improving nutrient cycling, vegetation vigor, and vegetative ground cover.

Roads concentrate precipitation run-off and can be a major source of sediment impacting watershed condition by impacting water quality and quantity. Road prisms have a direct impact on soils and also have a connected indirect effect by concentrating water that may result in soils adjacent to roads to experience gullying and sheet erosion. This ultimately impacts vegetation cover, composition, and diversity. Road impacts to vegetation, soil, and water resources are highly dependent on the maintenance level of the roads, road closure techniques, and road construction practices. A minimal road realignment is proposed in the proposed action, but is expected to have minimal to no affect. However, road maintenance associated with range improvement access may occur. Road maintenance measures will be performed using BMP guidelines and will result in a net benefit to road drainage and sedimentation. Upland soil resource activities associated with this project are not expected influence road runoff and sediment process. Hence, no cumulative impacts based on the roads indicator would occur.

Livestock Grazing occurs throughout the cumulative effect sub-watersheds. Improper management of livestock has the potential to impact watershed health by degrading soil and vegetation conditions. However, all land management agencies have grazing management plans intended to provide for vegetation, soil, and water quantity/quantity health.

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

Hydrology: Perennial stream flow in Arizona is generated mostly by high elevation areas where cool temperatures promote a snowpack and/or there is sufficient precipitation, particularly during cooler seasons, to push a wetting front in the soil column beyond the rooting zone (Winters 2006). Exceptions may be provided by geologic contacts or fault zones, where whatever moisture percolates into the soil substrate and bedrock may be forced up to the surface. Streams typically lose flow downstream in the lower precipitation zones, particularly as they pass onto the thick

unconsolidated fans of sediment skirting the mountains or deep valley and basin fill that have high groundwater storage capacity. High intensity rainfall, particularly as associated with the monsoon season may generate a brief period of overland flow and open channel flow in lower elevations where scarce vegetation cover exists (Faulconer 2014).

In the project area, the riparian areas have a somewhat contiguous nature to a few channel systems, but they are not all perennial and the incidence of springs does not always correspond to the larger mapped riparian zones.

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

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

PFC Surveys

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



Figure 2: Sycamore Creek, upstream from PFC (3) evaluation, February 2017.

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

Table 9. Summary of the riparian reaches that were evaluated as part of this analysis

Pasture: Sycamore Dougherty

Riparian: Sycamore Creek Downstream

Location:	Downstream extent of the Sycamore Exclosure	
Approx. Reach Extent:	1000 Ft	
PFC Rating	Proper Functioning Condition	
	Hydrogeomorphic Function:	Riparian Vegetation Condition:
Similar to site’s potential:	Yes	No
Rationale:	Stable, and in balance with flow regime and upland watershed. Some areas had high deposition of gravels coming off erosive granitic and basalt soils that have road and grazing influences.	Departure from potential limited to lack of representative cover from more than one age class of woody species. Grasses were abundant but had been browsed below desired stubble height.
Is livestock grazing an influencing factor?	No	Yes. Evidence observed of potential to limit woody recruitment and lack of stubble height on existing grasses.
Observations and factors which might affect trend:	Appears stable, bedrock influences through the reach. Area is upstream of valley pinch point causing sediment deposition in the area during flooding events; current stream system has cut through this sediment to form present channel.	Future enforcement of the sycamore exclosure will allow riparian vegetation reach potential for this area.

Riparian: Sycamore Creek Midstream (1)

Location:	Upstream of the Sycamore exclosure and adjacent to non-enforced exclosure	
Approx. Reach Extent:	1500 Ft	
PFC Rating	Functioning at Risk	
	Hydrogeomorphic Function:	Riparian Vegetation Condition:
Similar to site’s potential:	No	Yes
Rationale:	Unstable and braided reach, still recovering from flooding events of 1994 and 95. Some areas had high deposition of gravels and cobble coming off erosive granitic and basalt soils that have road and grazing influences.	Departure from potential limited to lack of representative cover from more than two age classes of woody species. Grasses were present but potential was departed and had been browsed below desired stubble. Recruitment of woody was present across all in-channel reaches and point bars.

Is livestock grazing an influencing factor?	No	Yes. Evidence observed on woody recruitment and lack of stubble height on existing grasses.
Observations and factors which might affect trend:	Primary channel is evident with side channels slowly infilling with vegetation and sediment.	No indicators of change in condition observed.

Riparian: Sycamore Creek Midstream (2)

Location:	Upstream of the non-enforced enclosure	
Approx. Reach Extent:	1500 Ft	
PFC Rating	Functioning at Risk	
	Hydrogeomorphic Function:	Riparian Vegetation Condition:
Similar to site's potential:	No	Yes
Rationale:	Unstable and braided reach, still recovering from flooding events of 1994 and 95. Some areas had high deposition of gravels coming off erosive granitic and basalt soils that have road and grazing influences.	Departure from potential limited to lack of representative cover from more than two age classes of woody species. Grasses were present and abundant near wetted areas. Recruitment of woody was present across all in-channel reaches and point bars.
Is livestock grazing an influencing factor?	No	Yes. Evidence observed on woody recruitment and lack of stubble height on existing grasses.
Observations and factors which might affect trend:	Two primary channels are evident with side channels slowly infilling with vegetation and sediment.	No indicators of change in condition observed.

Water Resources Desired Condition and Management Objectives

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

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

Project specific desired conditions:

- the maintenance of satisfactory conditions for water resources that meet State water quality objectives;
- the maintenance of functioning spring-fed riparian systems, and saturated soils where potential exists, that support vegetation within site potential and provide habitat for riparian-dependent plants and animals while providing water sources for wildlife and livestock needs;
- The maintenance of fully functional riparian systems supported by herbaceous and multi-age woody vegetation, within site potential, that provides for geomorphically stable stream channels and banks and habitat for riparian-dependent plants and animals.

Direct & Indirect Effects on Water Resources

Alternative 1

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

Intermittent and perennial flowing riparian areas in the Tank Creek Allotment were evaluated. One, the lower section of Sycamore Creek, was found to be in Proper Functioning Condition (PFC); while the two upper reaches were rated as Functioning at Risk with an upward trend. The management objective for both is to encourage vegetation on stream banks to improve the stability and achieve PFC.

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

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

Meeting Desired Forest Plan Conditions

Alternative 1 would meet the requirements of desired conditions for watersheds, in part because it is determined that grazing, at the current numbers, does not exert morphologic change, which is a function of infrequent storms, and probably in many reaches associated debris flows.

Cumulative Effects-Meeting Conditions of Clean Water Act

Grazing has been conducted continuously since the first recorded history of the allotment since 1909 on the Tank Creek Allotment. Prescribed fire has been used to reduce chaparral and promote grass; 8,650 acres between 1982 and 1989 across five pastures. Firewood cutting was allowed 1982 to 1984 in Spider and Jones pastures. Eight hundred (800) acres was treated to reduce juniper, by hand felling on Smith Mesa, 2012-2013.

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

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

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

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

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

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

Existing Condition

The Tank Creek and Tonto Mountain Allotments represent an area of approximately 39,000 acres on the Bradshaw Ranger District of the Prescott National Forest. These allotments are located in the northwest portion of the district, approximately 5 miles north of Skull Valley, AZ and approximately 15 miles west of Prescott, AZ. On the Tank Creek allotment, elevation ranges from 4600 feet on Tank Creek Mesa to ~5964 feet on Mount Josh. The topography varies from gently rolling mesa to steep rocky hill tops. There are several granite buttes scattered across the allotment. Major drainages are Weed Canyon, Woods Canyon, Hog Canyon, Dougherty Canyon,

and Sycamore and Tank Creeks. Riparian vegetation occurs along these stretches and is dominated by woody species such as cottonwood, velvet ash, and willows, with some areas of grass and grass-like vegetation where sediment has built up to form stream banks.

Tonto Mountain Allotment is located to the east and is adjacent to the Tank Creek allotment, the allotment is dominated topographically by Tonto Mountain, elevation 5631 feet on the east side and Mount Josh, elevation 5964 feet on the west side of the allotment. The vegetation is predominately chaparral and ranges in density and composition across the allotment. Juniper is scattered across the allotment as well. There are no perennial streams on the Tonto Mountain Allotment.

Vegetation on both allotments consists primarily of piñon and juniper with evergreen shrub and interior chaparral plant species. Canopy cover from shrub species is moderately to extremely thick in some locations to the extent that herbaceous forage is reduced or absent. A portion of the forage base of the allotment is provided by browse species such as turbinella oak with mountain mahogany, deerbrush, and skunkbrush found in smaller quantities.

The Piñon-Juniper Evergreen Shrub PNVT is moderately departed from desired conditions. Currently, about one-half of the Piñon-Juniper Evergreen Shrub in the project area is in a closed tree canopy cover state; however, a field visit confirmed much of Sycamore Mesa contains characteristics that are more indicative of a persistent Piñon-Juniper woodland, rocky shallow soil, low productivity, sparse herbaceous cover, multiple age classes of juniper and no evidence of recent fire.

As noted in the Forest Plan, the Semi-Desert Grassland PNVT across the forest shows severe departure from desired conditions in both vegetation structure and fire regime. Currently, about 90 percent of the Semi-Desert Grasslands within the project area have greater than 10 percent canopy cover from trees or shrubs. The desired condition for Semi-Desert Grassland is to have less than 10 percent woody canopy cover occur on 90 percent of the area. Fire historically occurred every 2 to 10 years in the Semi-Desert Grassland PNVT.

Juniper grasslands are moderately departed from desired conditions due to fire exclusion. This has allowed for increases in the density and canopy cover of trees and shrubs and a reduction in fire stimulated regrowth and germination of perennial grasses and forbs. The desired fire regime is every 1 to 35 years with low severity favoring regrowth and germination of native grasses and forbs.

The species composition, structure, and fire regime found within the Interior Chaparral PNVT are similar to desired conditions, so there is little to no departure. Interior Chaparral is in a constant state of transition from young to older stages and back again, with high severity fire once every 35 to 100 years being the major disturbance factor.

Recreational activity on these allotments is primarily associated with dispersed camping, off road vehicle use, and hunting. Access is limited. There are some motorized trails on both allotments that receive some use from off-highway vehicles, although these trails are rough and often used only by experienced riders. There are no developed recreation sites for camping on either allotment. Big game hunting opportunities exist for deer, elk, bear, and javelina. There are no designated wilderness areas on the allotment.

Endangered Species Act (ESA):

Thirteen species listed by the US Fish and Wildlife Service under the ESA were assessed (Wildlife Specialist Report – PR-18) and none of the species are known to occur within the project area or have habitat on or near the allotment.

Bald and Golden Eagle Protection Act:

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

Two golden eagle nest sites are known to occur on or near the allotment; one is on the north boundary of the Sycamore Dougherty pasture and the other is about 1 mile north of the allotment boundary. Considering that golden eagles can have a territory that ranges from 2 to 80 square miles based on the availability of prey, these nests are probably alternate nest sites for one pair of golden eagles that would be expected to forage within the allotment. Golden eagles primarily forage on jack rabbits and similarly sized prey items.

Migratory Bird Treaty Act:

Based on the vegetation types within the project area and the proposed treatments in the various vegetation types, 19 species out of 46 possible might be expected to occur within the project area. One species is a cliff nester, while the remaining species nest in some sort of vegetation substrate. Food sources range from small mammals to insects or seeds and berries.

Southwestern Region 3, Regional Forester's sensitive species:

Lowland leopard frog is known to occur along Sycamore Creek and Wood Spring in the project area (Emmons et.al. 2011; Sillas 2016). Wood Springs is located within the West Wood Holding Pasture. The drainage from Wood Spring and Draper Spring begin the interrupted perennial and intermittent system of Sycamore creek upon the Tank Creek Allotment. Tributaries crisscross the entire allotment. This stream reach has high variability of stream channel cross-section and woody riparian presence and density. Streamflow within the reach is interrupted perennial and intermittent (Hydrologist Report). There are about 3 miles of occupied/suitable habitat along Sycamore Creek located mainly in the Sycamore Exclosure and West pastures. Recent riparian-wetland area assessments rated two reaches of Sycamore Creek as Proper Functioning Condition (lower extent of Sycamore Exclosure) and Functional-at-Risk (Upstream of the Sycamore Exclosure) (Hydrologist Specialist Report).

Round tail chub is known to occur along Sycamore Creek about 0.5 miles downstream of the project area (AGFD 2013). There are about 3 miles of suitable habitat along Sycamore Creek located mainly in the Sycamore Exclosure and West pastures. The drainage from Wood Spring and Draper Spring begin the interrupted perennial and intermittent system of Sycamore creek upon the Tank Creek Allotment. Tributaries crisscross the entire allotment. This stream reach has high variability of stream channel cross-section and woody riparian presence and density. Streamflow within the reach is interrupted perennial and intermittent (Hydrologist Report). Recent riparian-wetland area assessments rated two reaches of Sycamore Creek as Proper Functioning Condition (lower extent of Sycamore Exclosure) and Functional-at-Risk (Upstream of the Sycamore Exclosure) (Hydrologist Specialist Report).

While plant surveys have not detected the presence of any sensitive plants within the allotment, specimens have been found in similar habitats adjacent to the allotment (Baker and Wright 1994). Arizona phlox grows on open exposed limestone-rocky slopes within pinyon-juniper woodlands or ponderosa pine-gambel oak woodlands. Flagstaff beardtongue was found on an adjacent allotment and similar habitat is known to occur on the Tank Creek allotment. This plant is restricted to small scattered limestone and sandstone outcrops of relatively undisturbed habitat at elevations arranging from 4,500 to 7,000 ft. Associated vegetation includes ponderosa pine, Gambel oak, blue grama, and alligator juniper.

Direct and Indirect Effects on Wildlife, Aquatic Species, and Rare Plants

Endangered Species Act:

With no federally listed or proposed species or habitats within the project area, this project would not have any direct, indirect or cumulative effects to any listed species or habitats.

Bald and Golden Eagle Protection Act:

Golden eagle:

Proposed Action:

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

Two proposed vegetation treatments occur near enough to known golden eagle nest sites to warrant some survey for golden eagle occupancy prior to starting any disturbing activities near the nest sites. The P-J evergreen shrub and Juniper Grassland treatments in Sycamore/Dougherty Pasture are close enough to known golden eagle nest sites to potentially cause disturbance to nesting eagles during the implementation phases of the projects. A buffer of approximately 1 mile from occupied nests would be necessary to avoid disturbance to nesting golden eagles (personal communication, Tuk Jacobson, AZGFD, April 14, 2017). A breeding season timing restriction or design modification of the project including access or location may be necessary to eliminate any take of eagles under The Act. The breeding season for the golden eagle in Arizona is typically January through July (Corman and Wise-Gervais 2005). This same breeding season timing restriction would apply to any fence maintenance or reconstruction in the vicinity of the nest site or any new nest sites. It is not expected that the final structures would have any impacts to the nesting and foraging golden eagles that may use the area. With these design considerations in place, no disturbance to nesting eagles would be expected to occur and thus, no take.

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

No Action:

With no activities to cause disturbance, there would not be any take of golden eagles under this alternative.

Migratory Bird Treaty Act:

No Action:

This alternative would not have any impacts under the MBTA.

Proposed Action:

Based on the vegetation types within the project area and the proposed treatments in the various vegetation types, 19 species might be expected to occur within the project area. No snags would be cut in this project except for safety purposes.

- Riparian – Bell’s vireo, common black hawk, yellow warbler, Lawrence’s goldfinch
 - Project is expected to maintain or improve riparian habitat quality thus providing for nesting and foraging habitat for these species. Proposed water developments in the uplands will alleviate cattle watering in riparian areas and relying solely on springs for water, thus improving riparian associated vegetation and habitat.
- Grassland habitat – Swainson’s hawk, ferruginous hawk
- Semi-desert grassland – Cassin’s sparrow, Grasshopper sparrow
- Desert & grassland – Lark bunting
 - The two hawks in this type nest in tree structures that would not be impacted by this project. While ferruginous hawks primarily prey on prairie dogs, Swainson’s prey on small mammals, reptiles, and other food sources when raising their young. The project would continue to provide ample habitat for all of these prey species. Habitat would be improved by vegetation treatments.
 - The Cassin’s sparrow, Lark bunting, and grasshopper sparrow may be impacted by projects within the grassland areas with some shrub component. Negative impacts from implementation would be of short duration and a localized scale. Long term benefits would include improved prey species habitat for insects and improved quality of forb and seed production in earlier seral stages of vegetation.
- Pinyon Juniper, Chaparral, Woodlands – gray flycatcher, gray vireo, pinyon jay
- PJ & Chaparral - black-chinned sparrow, black-throated gray warbler, canyon towhee
- Chaparral or woodlands – band-tailed pigeon, phainopepla, Virginia’s warbler,
 - Tree and shrub structures in these vegetation types would not be impacted by livestock grazing, thus providing nesting substrate including cavities and food items including nuts, seeds, and berries. Understory vegetation would be maintained or improved to provide for insect prey species habitat.
 - Vegetation treatments removing trees and brush would be done to balance age classes on the landscape, improve the health of the stand and associated plants. Negative impacts from implementation would be of short duration and a small localized scale. Long term benefits would include improved prey species habitat for

insects and small mammals and improved quality of forb and seed production in earlier seral stages of vegetation.

- Grasslands & Cliffs – prairie falcon
 - There would be no impacts to nesting habitat and the habitat for small mammals, birds and insects would continue to be maintained or improved under this project, particularly where vegetation treatments are done.

The nearest Important Bird Area to the project area would be the Watson and Willow Lakes IBA, about 20 miles away. This project would not impact any conservation issues for that IBA.

R3 Regional Forester's sensitive species:

Arizona phlox:

Proposed Action:

- Direct & Indirect effects: Open exposed limestone shelves are not the preferred areas for livestock grazing. Therefore, if the species did occur on the allotment, any direct or indirect effects to individual plants would be highly unlikely to occur. Herbivory or trampling of individual plants could occur as livestock passed through an area, if the species was present. The allotment was not identified as a priority area for finding additional sensitive plants in an assessment by Marc Baker (Baker 2009).
- Cumulative effects: There are no known projects impacting the vegetation on open exposed limestone shelves. Therefore, this project would not contribute to any cumulative effects for this species.

No Action:

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

Flagstaff beardtongue:

Proposed Action:

- Direct & Indirect effects: Limestone and sandstone outcrops are not the preferred areas for livestock grazing. Therefore, if the species were known to occur on the allotment, any direct or indirect effects to individual plants would be highly unlikely to occur. Herbivory or trampling of individual plants could occur as livestock passed through an area, if the species occurs on the allotment. The allotment was not identified as a priority area for finding additional sensitive plants in an assessment by Marc Baker (Baker 2009).
- Cumulative effects: There are no known projects impacting the vegetation on limestone or sandstone outcrops. Therefore, this project would not contribute to any cumulative effects for this species.

No Action:

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

Lowland Leopard Frog:

Proposed Action:

- Direct & Indirect effects: There would be limited effects to the species and their habitat from livestock grazing at Wood Springs and along Sycamore Creek because of the limited amount of grazing that would occur in the West Wood Holding, Sycamore Enclosure, and West pastures and with implementation of riparian utilization levels. Mechanical and hand thinning of junipers in PNVT grasslands would have no effect to the species or their habitat because none occur near occupied habitat and with implementation of protection measures would not have any sediment yields to occupied habitat. Prescribed fire in the chaparral and grassland PNVTs would have no direct effects to species and their habitat because none would occur within occupied habitat. Prescribed fire in the Upper Sycamore Creek, Weed Canyon, and Tank Creek sub-watersheds would have indirect effects from ash and sediment runoff from treatments areas to occupied habitat along Sycamore Creek. Prescribed fire in the Upper Sycamore Creek (4296 acres/16% of sub-watershed) and Tank Creek (2659 acres/21% of sub-watershed) sub-watersheds are mainly on low slopes and in grassland vegetation types which should result in low severity burn impacts and runoff to Sycamore Creek over a ten year treatment period. Prescribed fire in Weed Canyon sub-watershed (1707 acres/6% of sub-watershed) are expected to have high burn severity because of treatment within chaparral vegetation on steeper slopes. However, the small percentage of sub-watershed treated over the 10 year treatment period should have minimal effects to the species or their habitat in Sycamore Creek.
- Cumulative effects: The cumulative effects analysis area considered for effects to aquatic species and their habitat include the Upper Sycamore Creek, Weed Canyon, Tank Creek, Smith Canyon, Cottonwood Canyon, and Loco Creek sub-watersheds. The majority of land ownership is Forest Service. Livestock grazing occurs on forest, state, and private lands in these sub-watersheds. Standards and guidelines related to Range Management on Federal and state lands provide direction for maintaining or improving conditions on all allotments within these sub-watersheds. The Chino Landscape Project is in progress and would have vegetation treatments related to juniper thinning and prescribed fire in the sub-watersheds. With implementation of protection measures, effects to the species and their habitat in the Sycamore Creek drainage would have short-term indirect effects and long term beneficial effects to sub-watershed health. This alternative added to the cumulative effects from other livestock grazing and vegetation treatments would not change existing population or habitat conditions for the species in the cumulative effects area.

No Action:

- Direct & Indirect effects: With no livestock grazing (LG) and proposed range structural improvements occurring in the project area there would be no direct or indirect LG effects to the species or their habitat. There would be no impacts to riparian vegetation, aquatic

habitats, or to water quality. With no vegetation treatments occurring in the project area, there would be no effects from runoff of ash and sediments into occupied habitat.

- Cumulative effects: With no direct or indirect effects from this alternative, this alternative does not contribute to any cumulative effects for this species.

Roundtail Chub:

Proposed Action:

- Direct & Indirect effects: There would be limited effects to the species from livestock grazing along Sycamore Creek because of the limited amount of grazing that would occur in the Sycamore Enclosure and West pastures and with implementation of riparian utilization levels. Mechanical and hand thinning of junipers in grassland PNVTs would have no effect to the species or their habitat because none occur near occupied habitat and with implementation of protection measures would not have any sediment yields to occupied habitat. Prescribed fire in the chaparral and grassland PNVTs would have no direct effects to species and their habitat because none would occur within occupied habitat. Prescribed fire in the Upper Sycamore Creek, Weed Canyon, and Tank Creek sub-watersheds would have indirect effects from ash and sediment runoff from treatments areas to occupied habitat along Sycamore Creek. Prescribed fire in the Upper Sycamore Creek (4296 acres/16% of -) and Tank Creek (2659 acres/21% of sub-watershed) sub-watersheds are mainly on low slopes and in grassland vegetation types which should result in low severity burn impacts and runoff to Sycamore Creek over a ten year treatment period. Prescribed fire in Weed Canyon sub-watershed (1707 acres/6% of sub-watershed) are expected to have high burn severity because of treatment within chaparral vegetation on steeper slopes. However, the small percentage of sub-watershed treated over the 10 year treatment period should have minimal effects to the species or their habitat in Sycamore Creek.
- Cumulative effects: The cumulative effects analysis area considered for effects to aquatic species and their habitat include the Upper Sycamore Creek, Weed Canyon, Tank Creek, Smith Canyon, Cottonwood Canyon, and Loco Creek sub-watersheds. The majority of land ownership is Forest Service. Livestock grazing occurs on forest, state, and private lands in these sub-watersheds. Standards and guidelines related to Range Management on Federal and state lands provide direction for maintaining or improving conditions on all allotments within these sub-watersheds. The Chino Landscape Project is in progress and would have vegetation treatments related to juniper thinning and prescribed fire in the sub-watersheds. With implementation of protection measures, effects to the species and their habitat in the Sycamore Creek drainage would have short-term indirect effects and long term beneficial effects to sub-watershed health. This alternative added to the cumulative effects from other livestock grazing and vegetation treatments would not change existing population or habitat conditions for the species in the cumulative effects area.

No Action:

- Direct & Indirect effects: With no livestock grazing (LG) and proposed range structural improvements occurring in the project area there would be no direct or indirect LG effects to the species or their habitat. There would be no impacts to riparian vegetation, aquatic

habitats, or to water quality. With no vegetation treatments occurring in the project area, there would be not post-fire runoff of ash and sediments into suitable habitat.

- Cumulative effects: With no direct or indirect effects from this alternative, this alternative does not contribute to any cumulative effects for this species.

1.11 What are the Impacts to Recreational Activities?

Existing Condition

Recreation activity in the project area is primarily associated with hunting, wood-gathering, and off-highway vehicle use. There are no developed campgrounds or picnic areas on the allotment. Roads on the allotment may be used for scenic driving, although motorized travel must be on designated roads only (CFR 261.13). Motorized travel for dispersed camping can occur within 300 feet of a road that is open to motorized travel.

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

Inventoried Roadless Area

Inventoried Roadless Areas (IRAs) are a group of National Forest System lands that were previously identified by government reviews as lands without existing roads that could be suitable for Roadless Area Conservation (Roadless Area Conservation is a conservation policy limiting road construction and tree cutting). A review of the Prescott National Forest Inventoried Roadless Areas (IRAs) shows that about 2/3 of the Sheridan Mountain IRA is in the Tank Creek Allotment. There are no road construction activities proposed for Alternative 1.

Direct & Indirect Effects on Recreation

Alternative 1 –Grazing

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

Alternative 2 – No Action/No Grazing

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

Cumulative Effects on Recreation Resources

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

1.12 What are the Impacts to Heritage Resources?

Existing Condition

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

Tank Creek

Since 1987, thirty-five heritage surveys or reviews have been conducted that meet the current heritage standards for archaeological investigations on the PNF. The 35 projects were conducted for range improvements (13), fuelwood harvesting (8), APS line maintenance (4), riparian fence enclosures (5), Para-Archaeology training (2), road maintenance (1), small tract land exchange (1), and wildfire site inspection (1). These projects intensively examined a total of 3,230 acres. From the 1980s to 1993, eleven surveys were conducted but these surveys no longer meet the PNF's heritage survey standards for archaeological investigations and the acres will not be included in this analysis. Since 1971, a total of 104 heritage resource sites (one hundred prehistoric sites, two multi-components sites, and two historic sites) have been documented within the allotment by either PNF heritage specialists, para-archaeologists, or avocational archaeologists. The PNF consulted with the AZ State Historic Preservation Office (SHPO) and thirty-one of the prehistoric sites are eligible for the National Register of Historic Places (NRHP). While the other sixty-nine prehistoric sites, two multi-component sites, and the two historic sites are unevaluated for the NRHP but they will be treated as eligible until a formal determination can be made.

Tonto Mountain

Since 1992, seven heritage surveys have been conducted that meet the current heritage standards for archaeological investigations on the PNF. The 7 projects were conducted for road easements (3), range improvements (2), special use permit (1), and watershed health (1). These projects intensively examined a total of 43 acres. One survey was conducted but this survey no longer meets the PNF's heritage survey standards for archaeological investigations and the acres will not be included in this analysis. Since 1971, a total of seven cultural resource sites (6 prehistoric sites and 1 historic site) have been documented within the allotment by either PNF heritage specialists, para-archaeologists, or avocational archaeologists. The 6 prehistoric sites are unevaluated for the National Register of Historic Places (NRHP) but they will be treated as eligible until a formal determination can be made. The 1 historic site was determined not eligible for the NRHP in consultation with the SHPO.

Direct & Indirect Effects on Heritage Resources

Alternative 1 - Grazing

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

In the future, when additional range improvements or other ground disturbing management practices are needed, the PNF will complete the appropriate heritage surveys and/or reports as outlined in our Region 3 Programmatic Agreement Regarding Historic Property Protection and Responsibilities between the USDA Forest Service Region 3, the State Historic Preservation Officers of AZ, NM, TX, and OK, and the Advisory Council on Historic Preservation, signed 12/24/2003, and specifically, Appendix H: the Standard Consultation Protocol for Rangeland Management, signed 05/17/2007 and be in compliance with all applicable provisions of Section 106 of the National Historic Preservation Act.

Cumulative Effects of Alternative 1

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

Alternative 2 – No Action/No Grazing Alternative

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

1.13 Public Involvement and Tribal Coordination

Notice of the intention to initiate the present analysis of the proposed action for this allotment was provided in the Schedule of Proposed Actions (SOPA) at <http://www.fs.fed.us/sopa/> beginning in December of 2015. A scoping letter dated 1/19/2016 describing the proposal for grazing management was sent to the permit holders of the allotments, 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.

Six responses were received during the scoping period. Most of the responses concerned topics that are addressed in this Environmental Assessment. The responses did not raise concerns that would not be addressed through project design, including resource protection measures and incorporation of Best Management Practices, and following the standards and guidelines of the Prescott Forest Plan.

On May 10, 2017, a legal notice of a 30-day opportunity to comment on the proposed action and draft Environmental Assessment was published in the Prescott *Daily Courier*. Six responses were received during that period. Responses to those comments can be found in Appendix 5 of this document.

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

Individuals/Groups

Permittees – Smith Canyon Williamson Valley, K Four, Stephens, Quartz Wash, Hitt Wash, Yolo South, Old Camp, Walnut Creek, Camp Wood, Tank Creek Back Country Horsemen

Center for Biological Diversity Erik Ryberg

Friends of Anderson Mesa Jeff Burgess

Sierra Club – Yavapai Group

The Nature Conservancy

The Wilderness Society

WildEarth Guardians

Federal and State Agencies

AZ Department of Environmental Quality

AZ Game and Fish Department

AZ State Historic Preservation Office AZ State Land Offices

USDA Natural Resource Conservation Service

US Fish and Wildlife Service, AZ Ecological Services Office

Tribes

The Fort McDowell Yavapai Nation The Hopi Tribe

The Hualapai Tribe

The Tonto Apache Tribe

The Yavapai-Apache Nation

The Yavapai Prescott Tribe

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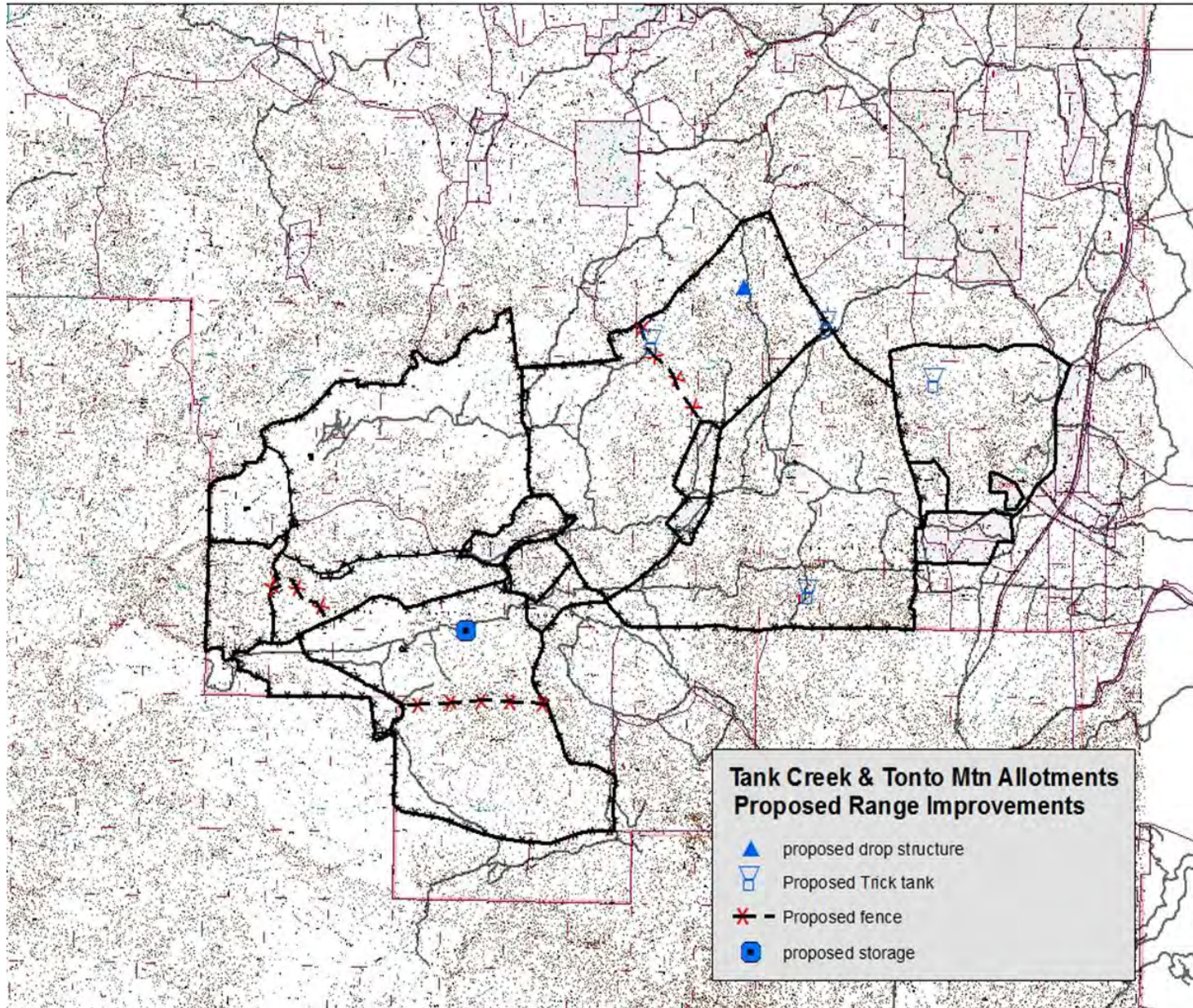
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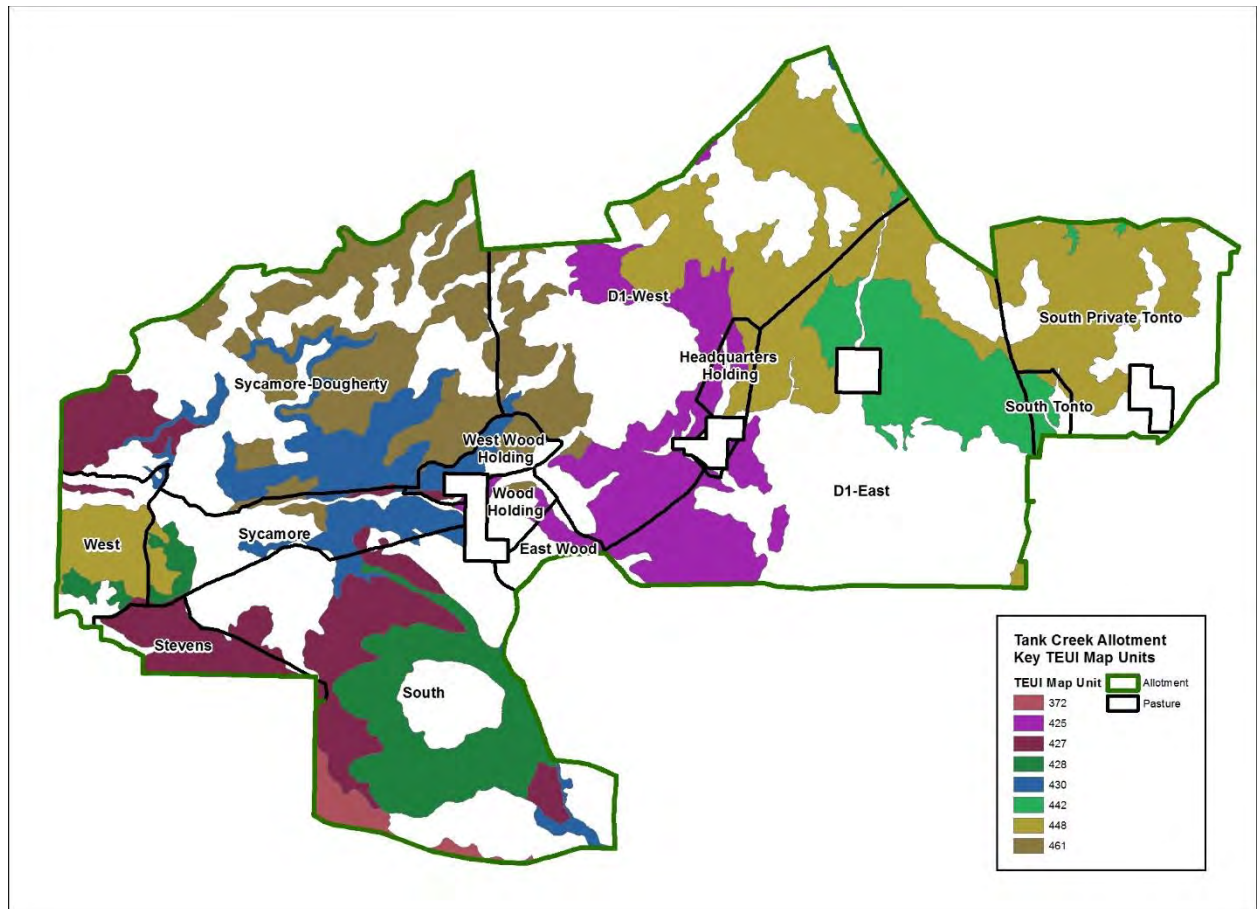
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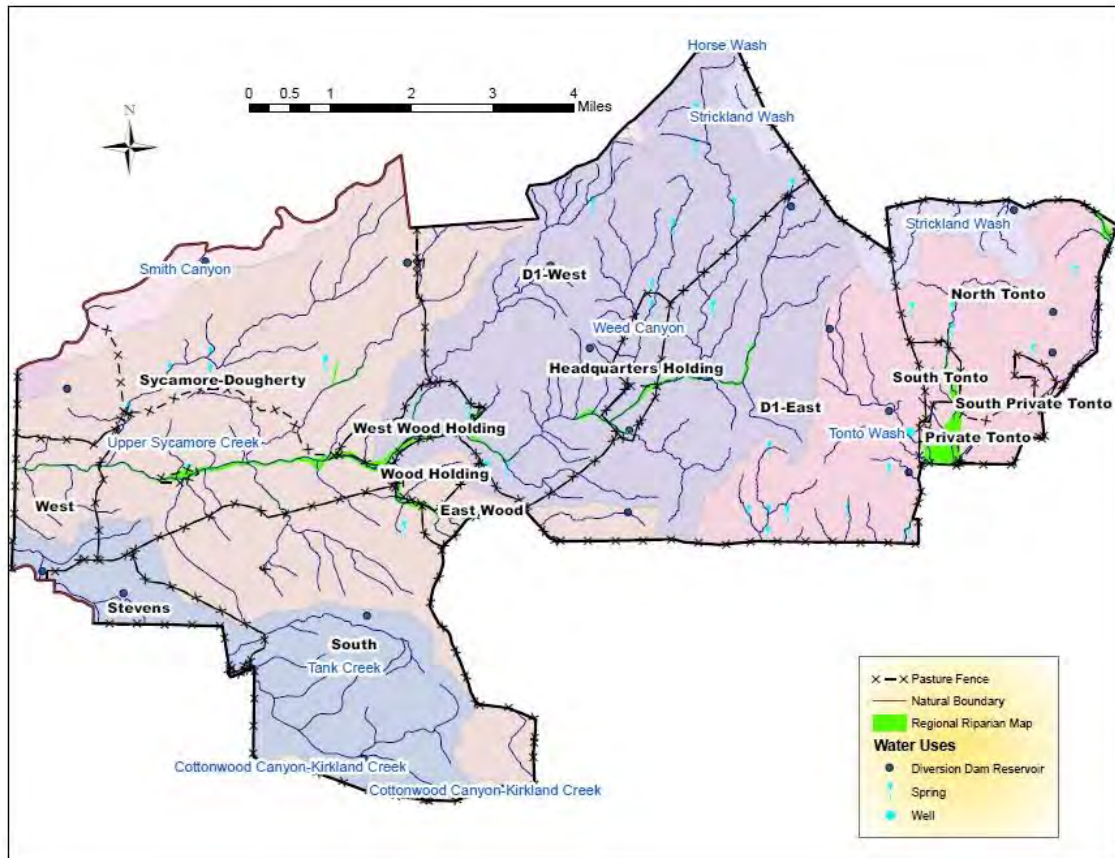
Appendix 1 – Project Area and Cumulative Effects Area Map



Appendix 2 – Key Vegetation and Soil Map Units



Appendix 3 – Key Watershed Map Units



Appendix 4 – Glossary of Terms

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

Allotment Management Plan (AMP) - An Allotment Management Plan (AMP) is unique, and is based on the individual landscape and ranch operation and will be modified with modification or issuance of a new permit following a NEPA decision to ensure consistency with the NEPA decision.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Ephemeral – A stream that flows only in direct response to precipitation, and whose channel is above the

water table at all times.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Threatened Species – Any species which is likely to become an endangered species within the

foreseeable future throughout all or a significant portion of its range.

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

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

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

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

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

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

Appendix 5 – Tank Creek Allotment Comment Analysis

Letters/Commenters:

#1 – Gail Steiger

#2 - Chino Winds/Multiple

#3 - Triangle NRCD Board

#4 – Justin and Dawn Salcito, JD Cattle Ranch Owner and Tank Creek Allotment Permittee

#5 - Jeff Burgess

#6 - Tom Slaback, Chair, Yavapai Group of the Sierra Club; Jenny Cobb, Great Old Broads for Wilderness

Letter or ID #	Comment #	Comment (entire or summarized)	Response
1	1	<p>I manage the Smith Canyon Allotment directly north and west of these allotments and I would like the opportunity to review and comment on your findings.</p> <p>I would like to note that in your scoping letter you cite precipitation recorded at the Chino Valley Ranger Station in 2015 and 2016 as falling into "normal" ranges.</p> <p>I can say with absolute certainty that rainfall on the south side of the Smith Canyon Allotment and on our private land west of the Sycamore /Dougherty pasture throughout 2015-2016 was nowhere near normal. This was an extremely dry period for that country and for the Tank Creek Allotment as well. Rainfall during our "monsoon" season is often very spotty and it is neither accurate nor fair to assume that rain measured in Chino Valley reflects rainfall 30 or 40 miles away.</p>	<p>We recognize that rainfall amounts can vary widely over the area. There are no decisions based solely on rainfall amounts.</p>
2	1	<p>We are writing to express interest in the environmental analysis being conducted on the Tank Creek/ Tonto Mountain Grazing Allotments.</p>	<p>The draft EA will be provided.</p>
3	1	<p>Thank you for the opportunity to comment on the Tank Creek Tonto Mountain Grazing Allotments. We feel that Alternative 1 is the best option for many reasons. This proposed action includes not only the</p>	<p>Thank you for being part of the process. Working together we can better ensure the health and productivity of the land.</p>

		continuation of grazing cattle but improvements to public lands. It plans for the development of new waters as well as improved fencing. This board believes that good management practices with cattle coupled with these waters and fencing will only better the land.	
4	1	<p>This letter is in regards to the Environmental Assessment on Tank Creek and Tonto Mountain grazing Allotments. As the permittees we were pleased to get a chance to weigh in on the comment period of this assessment. It was a very time consuming 5 week information gathering process that we were able to be a part of each day. This process was extremely important to our operation as well as our family. The ability to continue to ranch and improve the operation is a high priority.</p> <p>We believe that alternative 1 is the only action that ensures grassland health, while meeting the needs of public lands. Agriculture is the most effective way to continue open spaces in Arizona. As a permittee we believe that our operation restores native grasslands, recharges water tables and uses cows to control the over growth of brush. Our practices also promote the health of local wildlife. We maintain waters used by livestock as well as wildlife. Alternative 2 No Action is a detriment to land and wildlife.</p>	<p>Thank you for being part of the process. Working together we can better ensure the health and productivity of the land.</p>
4	2	<p>We are encouraged that the Forrest Service will take this information and it will result in action. Our concern for our ranch, as well as others in this area, are mainly brush control, water recharge and livestock/wildlife health.</p> <p>We believe that the reason some areas are not meeting a desirable conditions are not only due to lack of rain but also the over growth that hasn't been addressed in many years. As a permittee it would be reassuring to have this emphasized in the scoping letterer since it reaches so many people with various agendas for public lands. The general public doesn't have an idea how much maintenance water and grass lands require.</p> <p>The positive affect of fire and mechanical thinning on range health should be promoted by the Forrest Service as well as other agencies. In country that is</p>	<p>What we aim to achieve with this allotment management plan is an alternative that benefits the natural resources and wildlife habitat, insures a sustainable livestock operation, and provides a useful commodity for the public.</p>

		<p>has mostly brush it is a productive idea to introduce cattle back on the land as the grass and rain allow. After the expense and effort to mitigate the invasive brush and juniper the land can be maintained naturally by the use of livestock. Fire is a positive way to maintain land and we would like to continue to encourage each situation to be evaluated and to never to prescribe to a predetermined plan that excludes input from those on the ground.</p> <p>Sycamore enclosure has many issues .We believe the one grassy area that seems to be a point of interest can be fenced off without fencing the entire creek. Fencing this one area off will reduce the constant maintenance of water gaps and will have no negative affect on the rest of the creek. This project needs to be reevaluated and we look forward to working together to come up with a solution to manage this area.</p>	
5	1	<p>I support the combination of the two allotments into one for the sake of management efficiency. I also think it's a good idea to relocate the small sections of Forest Road 260 that currently go across private land.</p>	<p>We agree that the management of the combined allotments will be more efficient, and the reroute of FR 260 will better suit administrative and public access.</p>
5	2	<p>I have some questions, however, about your livestock management proposals. Your scoping letter, for example, proposes to permit up to 405 head of cattle yearlong on these allotments. But it doesn't say how this compares to the historical stocking rates. What were the actual stocking rates on these allotments during the last 10 years - the term of a grazing permit? Furthermore, your letter says the actual number of cattle you will permit on the allotment "could fall below the low end of the proposed stocking range." So what is the initial actual stocking rate that you are proposing? And if your proposed maximum permitted number of 405 head isn't realistic, why are you proposing to allow up to that number?</p>	<p>The stocking for the Tank Creek Allotment (the two allotments were managed as one since 2006) was between 375 - 405 head of adult cattle, cow/calf pairs and bulls yearlong. The initial stocking rate would be within the above range depending on the varying conditions according to adaptive management. (See Range Specialist report for the history of the stocking rates.)</p>
5	3	<p>Another important concern is the protection of the riparian areas on the Tank Creek allotment. Your letter mentions that there's a riparian enclosure pasture on the allotment, called the Sycamore</p>	<p>Sycamore Creek PFC – Sycamore Creek was one of three areas observed to ascertain PFC. Weed Canyon was reviewed for PFC just south of the private</p>

		<p>exclosure, and ecological conditions in the exclosure aren't meeting desired conditions. Considering the importance of riparian habitat in the desert Southwest, the improvement of the habitat in this exclosure should be one of your proposal's primary objectives - if not THE primary objective. Your letter says that there's evidence of livestock grazing inside the exclosure because the fencing hasn't been maintained. This is unacceptable, and probably illegal.</p> <p>In response to this problem, your main strategy is to build three new livestock waters on the uplands that you claim "will provide livestock waters away from riparian areas and allow for achievement or maintenance of desired conditions for riparian areas." So, instead of penalizing the grazing permittee for failing to maintain the riparian exclosure fences, you are rewarding him/her by building more livestock waters so that the uplands can support more cattle. (There's no research that I'm aware of that shows upland water sources encourage enough cattle to quit frequenting riparian areas to ensure their recovery.) How much will these new waters cost the taxpayers? And will the permittee be required to pay for the exclosure fence repairs?</p>	<p>inholding on D1-West Pasture and deemed unsuitable as it was an ephemeral system and the PFC protocol dictate intermittent or perennial systems. Wood Springs was also analyzed for PFC and found to be in Proper Functioning Condition within the West Wood Holding Pasture.</p> <p>A Decision Memo was signed 1/16/04 by the district ranger and 3 miles of fence on the north side of Sycamore creek was approved and installed to control livestock access on four miles of Sycamore Creek. Permittee agreed to maintain the fence and keep livestock out of sycamore Creek pasture. Move through by livestock would be granted as specifically outlined each year in the Annual Operating Plan. Livestock would be excluded for a minimum of 5 years. Long term monitoring (a minimum of 5 years from installation of fence) by a wildlife biologist will verify on-site that several age classes of dominant deciduous riparian woody species are present and in high vigor with the crown of the younger age class being fully out of browsing reach, prior to planning the first through the third year riparian graze. Only after recovery of the riparian vegetation community will grazing be considered. The annual operating instructions will describe any authorized grazing in the Sycamore Creek pasture. After recovery of the riparian vegetation, it is reasonable to expect that grazing in the Sycamore Creek pasture may not occur every year, and especially not during hot months (May – September). With AZ Game & Fish Department funds Habitat Partnership Program providing funding for the project. Also funding from the Prescott NF and the permittee.</p> <p>See EA pg. 12, #10 under Structural Range Improvements. Permittees are expected to</p>
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			share costs and maintain range improvements.
5	4	<p>One of the most important goals in public grazing allotment management plans in the arid Southwest is the protection of riparian areas from livestock grazing. Your environmental assessment (EA) for this project, however, creates more questions than it answers regards the allotment's riparian habitat.</p> <p>The EA, for example, is sorely lacking in useful descriptions of the allotment's riparian areas. It says that:</p> <p>Major drainages are Weed Canyon, Woods Canyon, Hog Canyon, Dougherty Canyon, and Sycamore and Tank Creeks. Riparian vegetation occurs along these stretches and is dominated by woody species such as cottonwood, velvet ash, and willows, with some areas of grass and grass-like vegetation where sediment has built up to form stream banks.</p> <p>And adds that:</p> <p>Major drainages are Holden Canyon and Ferguson Valley. There are no perennial streams on the allotment.</p> <p>But there are no descriptions of the locations of the perennial and intermittent stream stretches found on the allotment, including the pastures in which they're located. In fact, the EA talks about a Sycamore Enclosure Pasture but doesn't say where it is, and it's not identified on the accompanying allotment map? Nor is there any discussion about the history of this enclosure.</p>	<p>There is no perennial system within the older Tonto allotment, now the Tonto pasture of the Tank Creek Allotment. Strickland Wash and Tonto Wash drain the majority of Tonto Pasture.</p> <p>It is believed a formatting error caused the addition of the Holden Canyon and Ferguson Valley input. These two areas are not within the hydrology specialist report and will be corrected in the record. Sycamore Creek, which bisects the western half of the allotment in the Sycamore-Dougherty Pasture flowing west and is an interrupted perennial and intermittent system. Sections of Sycamore Creek retains pools throughout the year except for extended drought years. This interrupted perennial system begins from Wood Spring in Weed Canyon in West Wood Holding running west through the private inholding and into Sycamore-Dougherty pasture. Sycamore Creek flows intermittent with small sections of perennial pools until the stream exits the allotment to the west. There is a wide variety of intermittent systems— we utilize the Army Corps of Engineers definition – and the system has flowing water periods during the wet season (winter-spring), sustaining flow at least 30 calendar days per year, but are normally dry during hot summer months. Intermittent streams do not have continuous flowing water year-round and are not "relatively permanent waters."</p> <p>Rates of re-establishment and recovery of the desired riparian vegetation will vary. Throughout Sycamore Creek existing woody riparian vegetation is well established and regeneration of woody species is existent but sparse. The fragmented distribution of riparian</p>

			communities with interspersions of intermittent reaches between perennial segments will also influence the rates of species re-establishment.
5	5	Furthermore, the only key Terrestrial Ecosystem Unit Inventory (TEUI) map unit in the Sycamore enclosure is on the pasture's uplands, not in its riparian vegetation?	See EA at page 27: "For the purpose of these analyses, it is not practical to individually analyze each soil map unit occurring within an allotment or project area. To facilitate a meaningful analysis, representative Terrestrial Ecosystem Unit Inventory (TEUI) map units were selected in each pasture within the allotment. The location of these representative soil map units is displayed in Appendix 2. The areas selected for analysis are based on the key area concept; "a relatively small portion of a range selected because of its location, use, or grazing value as a monitoring point for grazing use. It is assumed that key areas, if properly selected, will reflect the overall acceptability of current grazing management over the range" (SRM 1998)."
5	6	<p>The section of the EA that lists the proper functioning condition (PFC) surveys conducted on the allotment's perennial and intermittent streams also raises some questions. It implies that the only stream worthy of assessment as a riparian area is Sycamore Creek. Is that correct?</p> <p>This PFC survey also shows that, despite the creek being inside an enclosure, there's evidence of livestock use within it, but there's no discussion about this problem in the EA. These survey results also mention a "non-enforced enclosure" on Sycamore Creek. What the heck does that mean?</p> <p>I suggest that the EA should be amended to include this essential information that's missing about the allotment's riparian habitat. There's no valid way to assess the merits of your livestock management</p>	PFC is only conducted in perennial and intermittent streams. The PFC guidelines state that areas assessed must have flow at least one month out of the year and have a distance of 0.25 miles. Based on our knowledge, Sycamore Creek is the only drainage in the allotment that fits this description. Though many of the other drainages support riparian vegetation (e.g. woody plants) these areas do not have long-term (i.e. > one month) flows and are more ephemeral.

		proposal without it.	
6	1	<p>We believe that livestock grazing on public lands</p> <ul style="list-style-type: none"> - Degrades landscapes. - Threatens native species. - Degrades water quality and quantity. - Destroys riparian habitat and tramples banks and springs. - Spreads invasive weeds. - Skews natural fire regimes - Accelerates soil erosion, damaging riparian and upland ecosystems and forests. - Forage consumed by domestic livestock is not available for native wildlife. <p>Detracts from the wilderness experience of camping, hiking, picnicking, swimming, wildlife viewing, and other uses.</p>	<p>Thank you and your organizations for your interest and concern for the management of our public lands. It is true that improperly managed livestock grazing can lead to all the problems you have listed. It is also true that well-managed livestock grazing can improve landscapes and not cause all those other problems. What we aim to achieve with this allotment management plan is an alternative that improves the land and habitat, insures a sustainable livestock operation, and provides a useful commodity for the public.</p>
6	2	<p>Introduction</p> <p>About Grazing Allotments (Page 5).</p> <p>It is stated that riparian vegetation occurs along Weed Canyon, Woods Canyon, and Sycamore Creek. Our previous and current observation show that there is no riparian vegetation along the upper reaches of these creeks with the exception of</p>	<p>As mentioned in the EA, riparian vegetation does occur along these stretches “and is dominated by woody species such as cottonwood, velvet ash, and willows, with some areas of grass and grass-like vegetation where sediment has built up to form stream banks.” Many of the drainages that have woody riparian forests are more ephemeral in nature; as a result, the water table is high enough in these systems to support woody obligates (e.g. Fremont cottonwood, velvet ash, etc.) yet low enough that it does not</p>

		<p>mature trees such as cottonwood, sycamore, box elder, and ash. (Photo 1)</p>	<p>support hydrophytes and other herbaceous riparian plants. Photo 1 is a good example of these more ephemeral riparian sites. Channel has a coarse sand substrate with a boulder/cobble matrix, understory is dominated by deer grass and Baccharis sp., and cottonwoods are small in size.</p>
6	3	<p>“Access is not limited.” (Page 6)</p> <p>Based on multiple trips to the allotment, we have found that access is very limited due to locked gates across Forest Service roads at private property boundaries, especially on FR260 and FR65. Washouts also prevented access to Tank Creek Mesa from FR9261L, to make a circumference of Bald Mountain to get back on FR260. In response to my e-mail to Kelli Spleiss, it was confirmed that even the Forest Service cannot attain access to Tank Creek Mesa without the permittee accompanying them to unlock the gates.</p>	<p>Access to the allotment is not limited in the sense that the Forest Service has no restrictions on access; the agency has no authority over gates and fences on private property. National Forest System roads that access the allotment, and most other National Forest System Roads, are classified as maintenance level 2, which is: “Assigned to roads open for use by high-clearance vehicles. Passenger car traffic, user comfort, and user convenience are not considerations. Warning signs and traffic control devices are not provided with the exception that some signing, such as W-18-1 “No Traffic Signs” may be posted at intersections. Motorists should have no expectations of being alerted to potential hazards while driving these roads. Traffic normally is minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level.” Maintenance level 2 roads are frequently in poor repair as our road maintenance schedule is dictated by user safety, degree of impacts to natural resources, and volume of use and funding levels.</p>
6	4	<p>1.5 What We are Proposing (Page 8)</p> <p>Authorization of “a range of livestock numbers from 375 to 405 head of adult cattle, cow/calf pairs and bulls yearlong not to exceed 4,860 AUM3s. We do not find AUM3 in the Glossary. However, we do</p>	<p>The term “AUM3” was a typographical error & will be corrected in the Final NEPA document, sorry for the confusion. Where livestock use is a factor in achieving less than desired conditions, livestock management and range improvements are designed to lead to improved conditions in these areas.</p>

		<p>know what an animal unit month is. What is an AUM3?</p> <p>Resource Protection Measures (Page 9, according to your bullet 3)</p> <p>“Minimum stubble height on key riparian herbaceous species: four to six inches where sedges and rushes are key and eight inches where deer grass is key;</p> <p>And according to bullet 4, “up to 20% use by weight on key woody species within riparian areas; or less than 50% of terminal leaders browsed on woody specimens less than 6 feet tall.”</p> <p>According to observations made on hiking up Weed Canyon and Upper Sycamore Creek, we have not found any plants meeting these specifications. The stream bottoms have been reduced to undulating sands formed by hoof action, with no banks, and a meandering stream.</p>	
6	5	<p>Site Specific Measures Summary (Page 11, bullet 4 Sycamore/Dougherty Pasture TEUI461)</p> <p>“This area requires vegetation treatments of juniper cutting . . .” According to our observations, this area has had juniper cutting on a reoccurring basis for at least 100 years with no corresponding grass regeneration. Stumps of differing ages and petrified slash is prevalent on mostly bare ground.</p>	<p>TEUI 461 was analyzed to collect baseline data to determine if any change would occur if vegetation treatments were to happen within this TEUI since it is more indicative of a persistent pinon-juniper woodland. The areas identified for potential juniper thinning on Sycamore Mesa include TEUI 481. TEUI 481 occurs in the depressions of the mesa and contains deeper soil which may have a better grass response to juniper thinning. There are certainly areas where juniper cutting would not improve range conditions nor result in more grasses and forbs; there are other areas where such treatments would likely result in more annuals and perennials. We have much better science and information than we did decades ago, and even just a few years</p>

			ago. The forest health and forest ecology specialists evaluated areas, both by map units and Potential Natural Vegetation Types (PNVTs), and identified which areas would respond well to the removal of juniper. See Figure 1 – Proposed treatment areas.
6	6	Roads In addition to your proposal to reroute two short sections of FR9405C and FR9400A, we also believe that FR260 should be either rerouted, or an easement acquired, around the private land containing the corral at East Wood pasture in order to gain public access to Tank Creek Mesa. Also, FR65 should be rerouted as a public road around the Private Tonto Pasture making a junction at Tonto Road. We believe FR65/121 is maintained at public expense having been graded in May and June of this year. The public should not have to use FR260 and FR9270K which are both in deplorable condition, to access the well-maintained road FR65/121.	The agency has considered a variety of options to help provide public access. A possible re-route for FR260 was considered, and we could not locate a reasonable alternative that would not require several miles of new road. Where the road encounters the private property, it is bordered by many large granite boulders. These would have to be blasted for some distance to route the road around the private property. The property owner was not interested in an easement due to past issues with trespassers. The reroute of the two short sections of FR9405C and FR9400A are included in this NEPA document because they do not require an easement agreement with the private land owners. The roads issue is beyond the scope of this NEPA document.
6	7	1.6 What Other Alternatives are being considered? What Has Already Occurred in the Project Area Table 2 Past Present and Future Activities in the 6th Code Subwatersheds Containing the Allotments. (Page 26 to 27) No water activities are listed. You must consider wells, tanks (and their enlargement), and trick tanks (Photos 11, 12, 13, and 14)	We interpret this comment to mean that the cumulative effects analysis should have included the impacts from wells, tanks, and tank enlargements. We do not include analysis of activities that have no measureable impact on the resource, which in this case is the watershed. Although there may be some trampling and concentration of use near these developed water sources, the area is too small and localized to impact the watershed. However, upland water developments will provide livestock water away from riparian areas and allow for achievement or maintenance of desired conditions for riparian areas.

6	8	<p>According to our observations in this area the primary place that we do find grass is under junipers. This appears to be because cows cannot get to the grass and the junipers provide a mitigating climate.</p>	<p>This soil type naturally has low (potential is 10%) grass cover. Grass in Photo 16 is red brome (invasive) and frequently establishes itself in bare ground. Because red brome is a winter annual, if it's not grazed in early spring while the grass is growing, cattle won't eat it after it has seeded in the summer.</p>
6	9	<p>What are the Costs Associated with the New Range Developments and Who Will Pay for This? (Page 48) "On the Prescott National Forest, the RFB is typically in the range of \$60,000 to \$80,000 per year to fund all the range development construction and reconstruction work across the forest." As previously referenced on Page 11 in the EA Structural Range Improvements, the first four water development projects would be the equivalent of \$80,000. In addition, there would be construction of a water lot and corral fence, a 30,000-gallon storage tank, three new fences at a cost of about \$12,000 per mile, and the extension of an existing fence, and 11,500 acres of juniper and brush treatment. This well exceeds the maximum \$80,000 in RBF funds for this Tank Creek/Tonto Mountain Grazing Allotments Management project, and does not include the costs of the proposed Chino Vegetation Management and Hassayampa Landscape projects. This is not fiscally possible.</p>	<p>As stated in the EA "The cost of constructing new range developments is typically shared between the agency and the grazing permit holder according to Forest Service policy as defined in the Forest Service Manual 2200, Chapter 2240. By proposing the projects in this analysis, there is no guarantee that funds will be available to implement the projects. The permittee can work with other agencies and groups that would like to help fund the project. The Natural Resources Conservation Service has many financial assistance programs to help fund projects. We have many examples on the Forest where the Environmental Quality Incentive Program (EQIP) has funded range improvement projects. 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. Some of the programs that the forest has been involved with are Habitat Partnership Committee (HPC), Central Arizona Grassland Conservation Strategy, and Wildlife Habitat Enhancement Initiative to help fund range/wildlife projects."</p>
6	10	<p>1.8 What are the Impacts to Soils and Watersheds? Sycamore/Dougherty Pasture TEUI461: "In areas where grasses are present and persistent treatment of the area juniper component is advised. Lop and scatter and retain a high amount of the litter." (Page 51) This has already been done for at least 100 years and it is still bare ground. The definition of insanity</p>	<p>As stated in response to comment # 5, there are certainly areas where juniper cutting would not improve range conditions nor result in more grasses and forbs; there are other areas where such treatments would likely result in more annuals and perennials. The forest health and forest ecology specialists evaluated</p>

		<p>is to keep doing the same thing and expecting a different result. The area is full of stumps with petrified litter covering the bare ground. (Picture 8 and 9) Livestock grazing must be sustainable. Grasses and other vegetation should be diverse, abundant, and in a full range of sizes and ages. There should be evidence of desirable plant recruitment and seed-head maturation. Before a pasture is depleted of grasses, vegetation, and healthy soils - leaving behind a stark landscape and erosion - the cattle shall be removed allowing rest of the grazed pasture for restoration, avoiding unsustainable, expensive, and sometimes destructive retreatment.</p>	<p>areas, both by map units and Potential Natural Vegetation Types (PNVTs), and identified which areas would respond well to the removal of juniper. The majority of this pasture is Sycamore Mesa and is comprised of TEUI 461 which is a low productivity soil that does not favor grasses (no treatments identified). In other areas of the pasture it appears the effects of historic overgrazing are still prevalent. Soil compaction started relatively deep, indicating compaction was not recent. Within this pasture the veg. treatments would focus on the west side in TEUI 463 and 427 which is in the Juniper Grassland PNVT.</p>
6	11	<p>Environmental Effects (Page 51) “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.” After more than 100 years of overgrazing and subsequent erosion we may have passed the tipping point and it will not come back. Table 7 on Page 52 seems to imply this in that the Sycamore/Dougherty Pasture is currently impaired and under both Alternative 1 and Alternative 2 will continue to be impaired.</p>	<p>It is true that historic overgrazing has caused changes in soil condition and function in some areas. Eliminating grazing altogether would not change that fact. This allotment management plan is intended to improve conditions where they can be improved by management, and to not degrade conditions where they cannot. Some condition improvements will require decades to be noticed, others may be more rapid. The parent material and the young basalt soils on much of Sycamore Mesa will not conditionally change with or without grazing. Much of this area is a young basalt top with little soil development. Soil has deposited in the lower lying areas of the slightly undulating plain. These area were soils has developed are the proposed treatment areas. The proposed treatment area on western portion of the Sycamore Dougherty Pasture is a transition from a basalt cap to an area with deeper soils including a granitic component.</p>
6	12	<p>Alternative 1: Grazing.</p>	<p>See response to comments # 5 and #10; Our records show there was a green juniper woodcut in the 80s.</p>

		<p>Sycamore/Dougherty Pasture 461. (Page 52) “This site was selected to collect initial data in this TEUI prior to vegetation treatment. This site would be monitored in the future when vegetation treatment occurs to monitor the changes in the vegetation.”</p> <p>Vegetation treatments at this site have been ongoing for at least 100 years If you have not figured this out my now, you never will.</p>	
6	13	<p>Alternative 2: No Grazing. (Page 53) Every one of these pasture descriptions read identically to those listed on the previous page as Alternative 1 grazing. Each of these pasture descriptions for the No Grazing Alternative assumes that all improvement projects indicated under Alternative 1 Grazing are continued even though your definition of Alternative 2 No Grazing (Page 19) state that they will not be continued. On Page 55, Alternative 1: Grazing, and Alternative 2: No Grazing both read the same. In Alternative 1: Grazing, the word all is misspelled as al.</p>	<p>The pasture descriptions sound identical because under either alternative soil conditions are expected to improve under this plan where they are unsatisfactory or impaired, that is if current livestock grazing is a factor in that condition. The improvements would not be necessary to manage livestock grazing if there were no grazing; the soil conditions would improve either with grazing and the range improvements, or without grazing and no range improvements. (See Response to 11.)</p> <p>The spelling of all was a typographical error. It will be corrected in the record.</p>
6	14	<p>On Page 63 is stated “5884 feet on Josh Mountain,” while immediately following on Page 64 it states, “Mount Josh, elevation 5,956 feet.”</p>	<p>The correct elevation for <u>Mount Josh</u> is approximately 5964 feet and will be corrected in the record.</p>
6	15	<p>From our exploration, Wood Springs drains into Weed Canyon which then drains into Sycamore Creek. The identical paragraph beginning with the sentence “The start of perennial water . . .” is immediately repeated in the next paragraph. Both paragraphs state that “There are about 3 miles of occupied suitable habitat along Sycamore Creek . . .” From our hikes of Weed Canyon and Sycamore Creek, we found that no riparian habitat, except for mature trees, exists.</p>	<p>Should state “interrupted perennial”, from the hydrology specialist report. (We will correct this error in the record.) “The confluence of the drainages from Wood Spring (which is Weed Canyon) and Draper Spring begin the interrupted perennial and intermittent system of Sycamore Creek upon the Tank Creek Allotment. Tributaries to this system crisscross the entire allotment. This stream reach has high variability of stream channel cross-section and woody riparian presence and density. Streamflow within the reach is interrupted perennial and intermittent.” Interrupted perennial or spatially interrupted refer to sections of Sycamore Creek that will retain pools with</p>

			subsurface flow throughout the year, providing habitat for the lowland leopard frog.
6	16	"This plant is restricted . . . habitat at (not sat) elevations . . ."	We will correct this typographical error in the record.
6	17	Direct and Indirect on Wildlife, Aquatic Species and Rare Plants. Bald and Golden Eagle Protection Act: (Page 66) "Livestock grazing as proposed would be expected to maintain or improve the physical structure of habitat for prey species. . ." How is bare dirt expected to maintain or improve habitat for prey species?	Livestock grazing as prescribed in the Proposed Action would maintain or improve forage vegetation on the allotment. See EA pages 45-46. This would benefit prey species for the Golden eagle by providing forage and cover habitat.
6	18	Migratory Bird Treaty Act: Riparian (Page 67) "Project is expected to maintain or improve riparian habitat quality." This can only be true if cows are removed from the riparian and potential riparian areas which they have and continue to devastate.	The management plan for this allotment is expected to maintain or improve riparian habitat. See EA pages 57-60.
6	19	Grasslands & Cliffs – prairie falcon (Page 67) "There would be no" in place of "not" impacts . . .	We will correct this typographical error in the record.
6	20	Hoof action has decimated the channel and banks to bare sand. The very sparse vegetation is kept to half an inch or less stubble. There are no sedges/rushes, no young woody plants, only mature trees.	The management plan for this allotment is expected to maintain or improve riparian areas to proper functioning condition with diverse composition and age-class of riparian vegetation. See EA pages 57-60.
6	21	(You have not included a list of beneficial effects with No Action, no livestock grazing throughout the EA.)	The EA states, Under the no action alternative there would be no impacts from livestock grazing or range improvements. Under either alternative, improvements to riparian habitats are expected.
6	22	"Dispersed camping can occur within 300 feet of a road that is open to motorized travel" This is only correct when dealing with vehicle camping. Foot or horse dispersed camping can occur anywhere that it is legally allowed.	You are correct, this should read "motorized travel for dispersed camping can occur ... ". We will correct this typographical error in the record.
6	23	"There are no records of complaints and/or negative experiences concerning interactions with livestock from recreationalists in this area." You are consistently including this quote in your recent EA's. We had a complaint in our last EA	We are referring to specifically this allotment in which we had not received any complaints prior to this process.

		response. Here is another official record of complaint. We do not feel it is in our health interests to have body contact with water where cows are grazing, defecating, and urinating into the water let alone using that water source for human consumption.	
6	24	<p>“Most recreationists involved with various recreational activities . . . would not notice a difference if cattle were no longer on the allotments.”</p> <p>As people engaged in all the recreation activities you have listed, we would notice a difference. One important activity is conspicuously absent from your list – wildlife viewing.</p>	We most certainly can include wildlife viewing as an activity.
6	25	<p>Grazing:</p> <ul style="list-style-type: none"> - Is not sustainable on the semi-arid public lands in the southwestern United States; - Is a drain on increasingly scarce taxpayer resources; - Causes sheet and gully erosion and changes soil structure; - Destroys riparian habitat; - Is harmful to all native wildlife, i.e. Wildlife Services uses indiscriminate, lethal means to protect cows from predators; - Does not promote healthy vegetation; - On the PNF has enabled the permittees to close off forest access to the public; - Is not economically feasible without public subsidization on the semi-arid public lands of the southwest; - Destroys biological soil crusts; - Under current conditions, on these semi-arid public lands, is animal cruelty. <p>In the last 30 years, the PNF has allowed the major roads of this allotment (FR65, FR65A, and FR260) to deteriorate to a condition that in some cases is even impassable to a four-wheel drive vehicle.</p>	Overgrazing can lead to many of the natural resource issues listed; proper grazing management would not. Permittees, and anyone with private inholdings, can and do often restrict access across their private lands for a variety of reasons. Road maintenance is likely to remain an issue for the Forest Service as funding for it declines.
6	26	<p>Four pastures have been identified as not meeting desired soil and vegetation conditions;</p> <p>We object to you spending our tax dollars on treatments to convert woodlands to grasslands when it will require perpetual re-treatments.</p>	<p>-The pastures identified as not meeting desired conditions are expected to improve with the proposed management plan and range improvements.</p> <p>- See responses to comments #5, #10, & #12.</p>

		<p>Continuous grazing does not allow the build-up of the fine fuels required to allow the natural fire cycle to return.</p> <p>This EA and all future EA's must include maps that show the roads, allotments and pastures, topography, and location of your sampling sites (in standard GPS coordinates, not UTM's).</p> <p>We cannot allow the Prescott National Forest to continue to decline from livestock grazing.</p>	<p>-Well managed grazing can allow for the build-up of fine fuels.</p> <p>-The maps display what is necessary to show the location of a project and features that are relevant to the analysis. We attempt to also provide additional features to assist the public and our own specialists understand how the allotment is divided into pastures and where access roads are located. Sampling sites are merely sites selected to assist the agency in evaluating trends and are not required to be displayed.</p> <p>-The USFS does not expect the Prescott National Forest to decline from livestock grazing.</p>
6	27	<p>Domestic livestock grazing in Wilderness areas is anathema to the wilderness ideal, but legal nonetheless. 1. Livestock degrades wilderness landscapes; 2. Grazing threatens native species; 3. Grazing degrades water quality and quantity, destroys riparian habitat and tramples banks and springs; 4. Grazing spreads invasive weeds; 5. Grazing skews natural fire regimes; 6. Grazing accelerates soil erosion, damaging riparian and upland ecosystems and forests; 7. Forage consumed by domestic livestock is not available for native wildlife; and 8. Grazing detracts from the wilderness experience of camping, hiking, picnicking and swimming.</p>	<p>Thank you and your organizations for your interest and concern for the management of our public lands. It is true that improperly managed livestock grazing can lead to all the problems you have listed. It is also true that well-managed livestock grazing can improve landscapes and not cause all those other problems. What we aim to achieve with this allotment management plan is an alternative that improves the land and habitat, insures a sustainable livestock operation, and provides a useful commodity for the public. There are no designated Wilderness areas within the Tank Creek Allotment.</p>
6	28	<p>The purpose stated "is to continue to authorize livestock grazing on the Tank Creek/Tonto Mountain Allotments." We believe the purpose should be to halt erosion, restore riparian areas to proper functioning condition, and provide for healthy wildlife populations and their habitat. When these conditions are met, as a secondary purpose, livestock grazing may be reauthorized.</p>	<p>As stated in the EA the proposed livestock management is expected to aide in halting erosion, restore riparian areas to proper functioning condition, and provide for healthy wildlife populations and their habitat.</p>
6	29	<p>Thank you for proposing adaptive management that will take into account the changing needs of the land, its wildlife, especially in the light of climate change which is expected to continue into the future.</p>	<p>What we aim to achieve with this allotment management plan is an alternative that improves the land and habitat, insures a sustainable livestock operation, and provides a useful</p>

	<p>Due to the lengthy time scale for implementing the proposed project, Adaptive Management (AM) practices are appropriate. A detailed, well designed AM plan will transfer lessons learned from earlier projects to current and future projects, thus improving the overall result.</p> <p>If implemented, AM is acceptable to us only when:</p> <ul style="list-style-type: none"> * The management plan includes a clear statement of management objectives, desired conditions, current conditions, and a monitoring plan designed to monitor each condition as simply and directly as possible. * The range of potential AM actions should be constrained and defined for each management objective. AM actions must not permit or create degradation. Management actions outside of the defined AM range should require more comprehensive analysis. * A monitoring data collection plan should be specified and funded. The plan should describe the monitoring procedures, frequency, and locations for each management objective. * The monitoring plan should be comprehensive enough to inform potential AM actions, yet simple enough to be sustainable. If monitoring indicates that progress towards desired conditions is not being achieved on the allotment the permittee will cooperate with the PNF in the modification of the management plan. * The monitoring plan is expected to change as PNF and stakeholders gain experience in the project. * A monitoring workgroup should meet at regular intervals, or when resource conditions change, to review monitoring data and make recommendations for AM changes to the responsible official. The workgroup should be led by PNF staff and include a range of stakeholders. * Planned AM actions should include public notice and comments before activation. * Monitoring records must be maintained permanently in a form that is available for current and future public review, and future forest service comparative data analysis. * Adaptive management should be a consistent strategy across on all alternatives or not be used at 	<p>commodity for the public.</p>
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		<p>all, and it must be implemented in a manner that protects the resource.</p> <p>* The limitations of a monitoring program must be acknowledged and taken into consideration, including the fact that once monitoring detects problems, damage has already occurred. This principle supports an incremental and conservative management strategy.</p>	
6	30	<p>The Land – Soil and Vegetation:</p> <p>Biological soil crusts are an ecologically important soil cover that exist around the world are critical ecological components of arid ecosystems. They perform a variety of ecosystem functions, such as holding soils in place, increasing soil health and improving water infiltration and retention. Soil crusts are especially vulnerable to destruction from disturbances such as livestock grazing. By increasing readily available nutrients in the soil, plants that grow in or near crusts have been found to have increased mineral uptake. The bacteria produce compounds that stimulate plant growth and have also been found to limit the invasive cheatgrass species. Crusts can also influence and increase water retention.</p> <p>We are concerned with the health of the soil, which will promote healthy vegetation and increase water retention to further prevent erosion. It is vital that further monitoring of soils and vegetation be done beginning with the creation of a baseline analysis before further grazing is allowed on these allotments, and continuing periodically with the seasons. Existing effects of erosion should be repaired by sustainable means.</p>	See EA pgs. 9-16 & 48-57
6	31	<p>Riparian Habitat and Wildlife:</p> <p>Grazing transforms riparian zones trampling springs and banks leaving behind mud pools, devastating water quality, hastening erosion, and robbing wildlife of habitat and clean water. Because of past damage, and to prevent further damage to riparian habitat and vegetation, there should be baseline analysis and continued monitoring to meet current or future standards, especially in the light of climate change. We are concerned with keeping lands and</p>	See EA pgs. 48-60

		<p>waters intact that sequester carbon and help species adapt to changing conditions.</p> <p>In the 1990 Juniper Management Plan for the Tank Creek Allotment (JMPTCA), mule deer are identified “as the species to be emphasized . . . “ “ There is also an antelope herd that frequents Tank Creek Mesa.” We believe that these species must be considered in the Tank Creek/Tonto Mountain Management Plan. The plan should include analysis of critical habitat for the leopard frog in Sycamore Creek.</p> <p>You have identified one area on Sycamore Creek to be in Proper Functioning Condition (PFC) and two areas to be at Functioning Risk. These riparian areas will not be grazed.</p>	
6	32	<p>Livestock and Water: Cattle need water. We would like to see positive methods employed to maintain healthy water sources, providing the least destructive methods of trick tank construction. Wells will be discouraged.</p>	Comment of opinion is noted and considered by the Deciding Official.
6	33	<p>Public Access: The forest is for all us. Human and wildlife access (such as removal of the lower fence wire) will be maintained in a manner to prevent resource damage. This shall include road closures during times when vehicle access would cause soil erosion and stream siltification.</p>	Comment of opinion is noted and considered by the Deciding Official.
6	34	<p>Sustainable Grazing: Grasses and other vegetation should be diverse, abundant, and in a full range of sizes. There should be evidence of desirable plant recruitment and seed-head maturation. Before a pasture is depleted of grasses, vegetation, and healthy soils, leaving behind a stark landscape and erosion, the cattle shall be moved to another location to allow rest of the grazed pasture for regrowth, avoiding an unsustainable, expensive, and sometimes destructive re-treatment.</p>	See EA pgs. 26-44
6	35	<p>Climate Change: Climate change must be analyzed in the plan. It is predicted that the Southwestern region will experience increasing temperature, longer and deeper droughts, and more extreme precipitation</p>	Adaptive management and forest plan direction account for effects of climate change. See EA pg. 8

		events. Through adaptive management strategies, you must respond to climatic variability (e.g., drought) and change by utilizing a variety of tactics, including flexible stocking rates and grazing strategies to conserve natural resources.	
6	36	Pastures Not Meeting Desired Conditions: The four pastures you have identified as not meeting desired soil and vegetation conditions will not be used for grazing until such time they meet the parameters your team has established to support grazing, including (1) satisfactory soil condition but not trending which we feel might delay reaching a full satisfactory condition; (2) providing nutrient cycling; (3) soil stability; and (4) hydrological functions. The current allotment conditions must be compared to those of the 1990 JMPTCA, and the 2000 and 2010 conditions. The cumulative impacts from all the previous TC/TM management projects must be analyzed as part of adaptive management. Any area(s) where current conditions do not meet or exceed those from the previous plan must not be grazed until they reach desired conditions.	Comment of opinion is noted and considered by the Deciding Official.
6	37	Nonstructural Range Improvements: Alligator juniper and Arizona sycamore are not to be removed.	Comment of opinion is noted and considered by the Deciding Official.
6	38	Structural Range Improvements: Where these improvements are needed to sustain the livestock, the permittee will need to have constructed the grazing improvements before allowing grazing in that pasture. The permittee is responsible to keep the livestock within the pasture being utilized and to keep them out of streams, springs, and other areas of habitat concern. Existing grazing exclosures, along with newly created ones, should be used to monitor the project. This will hopefully prevent the creation of another world's largest bonzai forest as previously occurred on Big Bug Mesa after the fire.	Comment of opinion is noted and considered by the Deciding Official.
6	39	We would like you to provide a field trip to the newly formed Tank Creek Allotment, including Sycamore Creek, before you issue the EIS.	Comment is noted and will be considered by the Deciding Official.