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VERDE RIM LIVESTOCK GRAZING ENVIRONMENTAL ASSESSMENT

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VERDE RIM LIVESTOCK GRAZING PROJECT

Environmental Assessment

USDA Forest Service
Prescott National Forest, Verde Ranger District
Yavapai County, Arizona

CHAPTER 1 - PROJECT SCOPE

Introduction:

The Verde Rim Livestock Grazing Project is collectively made up of the Bald Hill, Copper Canyon, Squaw Peak, and Young Allotments located on the Verde Ranger District, Prescott National Forest (Figure 1, Verde Rim Grazing Allotments). The combination of these allotments into a single analysis is based upon geographic proximity and the similarity of both the ecology and the patterns of human activities in the area.

Details of the analysis conducted for this project are contained in the project record (PR), located at the Verde Ranger District Office, 300 East Highway 260, Camp Verde, Arizona. This record is incorporated by reference into this environmental assessment in its entirety.

The project area is situated South of Camp Verde, Arizona in T12, 12 ½, and 13 N, R 4 and 5E, Gila and Salt River Meridian and involves approximately 39,480 acres within the boundaries of the Prescott National Forest (Bald Hill 15,711 acres, Copper Canyon 10,205 acres, Squaw Peak 12,600 acres, and Young 964 acres). A portion of the Cedar Bench wilderness area and the Verde Scenic River are within the project area (Squaw Peak Allotment). The analysis area also includes portions of the Cherry Creek-Upper Verde River, Fossil Creek-Lower Verde River, and Ash Creek-Sycamore Creek 5th level watersheds, as well as State and private land parcels that are not administered by the Forest Service. However, the proposed action is limited to activities on the Forest Service administered lands.

Livestock have grazed this area for over a century. Settlement along the Verde River and homesteads at reliable water sources away from the river in the 1860's brought the introduction of domestic livestock that resulted in high stocking rates until the 1890's when severe drought depleted the herds. Grazing at more controlled stocking rates has continued into modern times (PR#126). Table 1.1 illustrates the season of use, permitted numbers and stocking levels over the past 10 years for each allotment. The numbers are representative of the drought years.

TABLE 1.1 – Season of Use, Permitted Numbers, and Stocking Levels

Allotment	Bald Hill	Copper Canyon	Squaw Peak	Young
Permitted #	172	100	90	9
Head Months	2064	1200	1080	108
Season of Use	3/1 - 2/28 (yearlong)	3/1 - 2/28 (yearlong)	3/1 - 2/28 (yearlong)	3/1 - 2/28 (yearlong)
Year	Head Months (Permitted # x 12 months)			
2004	1008	480	240	0
2003	963	480	134	0
2002	1244	640	134	0
2001	2064	960	900	108
2000	2064	900	900	82
1999	2070	900	1083	110
1998	1203	720	1083	0
1997	1423	1200	1095	0
1996	0	770	1095	0
1995	0	1200	414	110
10-year Average	1204	825	708	41

The Copper Canyon, Squaw Peak and Young Allotments are on the east side of the Verde Rim and run from the alluvial fans near the Verde River to the steep slopes at the top of the Rim west of the River. The Bald Hill Allotment is on the west side of the Verde Rim adjacent to the Copper Canyon Allotment.

The Bald Hill Allotment is one of the 29 problem allotments identified in the Prescott National Forest Land Management Plan (LMP), supporting Environmental Impact Statement (EIS) and Forest Planning records. Bald Hill Allotment was identified as problematic because of minor overstocking, unsuccessful rotation schedules, and the need to reduce juniper density (PR# 133). The allotment was rated as second priority because a new allotment management plan (AMP) addressing these findings was prepared (but not fully implemented) during the Forest Planning process. Since that AMP was implemented juniper density has been reduced and management improved, resulting in upward trends. The allotment currently meets the Forest Plan definition for satisfactory condition (PR# 1 pg 32) and this analysis will confirm the continued satisfactory condition while updating the AMP.

Data collection, analysis, consultation, and public/permittee participation has been ongoing for a number of years. The project was first placed on the Prescott National Forest's Schedule of Proposed Actions (SOPA) in 1998 and has been listed in every quarterly SOPA since then. Grazing permit holders and the public were involved in scoping and development of alternatives through 2002. An Interdisciplinary Team (IDT) completed the environmental analysis (EA) in 2004. Decisions regarding grazing management for each of the allotments involved in the project were made by the District Ranger on September 30, 2004. Three individuals and an environmental organization appealed the decisions. The Appeals Deciding Officer (Prescott National Forest Supervisor) reversed the decisions and returned the EA back to the District

Ranger for further analysis, increased documentation and new decisions (PR#109). This current EA represents that further analysis and documentation.

Purpose and Need for Action:

The purpose of the proposed action is to:

- Authorize continued livestock grazing on the Bald Hill, Copper Canyon, Squaw Peak, and Young Allotments.
- Establish permitted stocking, season of use, and grazing system for each allotment.
- Issue new 10-year term grazing permits for those allotments.

There is a need to:

- Increase or maintain VGC and perennial grass composition and cover in pinyon/juniper woodlands, desert shrub/grassland, and chaparral communities to the extent attainable with the existing tree/shrub canopy.
- Improve soil function to enhance soil conditions.
- Allow riparian vegetation to reach or move towards potential.
- Allow channel profiles to return to appropriate dimensions for site morphology and channel functions.
- Adjust the currently permitted livestock numbers to provide flexibility to adjust for fluctuations in available water and forage.
- Determine appropriate allowable use/utilization levels.
- Respond to regulations [36 CFR 222 Subpart A, 222.2 (c)] that direct the Forest Service to make forage available for livestock under direction contained in the Land Management Plan of the Prescott National Forest.
- Respond to Section 504 (a) of the 1995 Rescission Act (Public Law 104-19) that requires the agency to complete National Environmental Policy Act (NEPA) analysis and decision on all grazing allotments.

Proposed Action:

This is the Proposed Action that was sent to the public for scoping in 2002. Alternatives to this Proposed Action are displayed in Chapter 2.

The Verde Ranger District of the Prescott National Forest proposes to...

1. Permit continued livestock grazing on the Bald Hill, Copper Canyon, Squaw Peak, and Young Grazing Allotments.
 - a. Issue new 10-year term grazing permits for each of the allotments.
 - b. Provide for year-round grazing.
 - c. Allow for fluctuations in available water and/or forage dictated by changing weather by authorizing use within the range of 130 – 172 mature cattle on Bald Hill, 80 – 100 mature cattle on Copper Canyon, not to exceed 60 mature cattle on Squaw Peak, and not to exceed 108 animal months on Young.
 - d. Maintain a 5 pasture deferred rotation system (Pinto Mesa, Bates/Bull, Durfee, Bald Hill, Arnold) on the Bald Hill Allotment, keeping the Arnold Pasture winter use only due to the limited grass in the pasture. During the growing season keep the grazing period in any pasture as short as possible, allowing for multiple entries into some pastures.
 - e. Maintain a 4 main pasture deferred rotation system (Copper Canyon, Tompkins, Box T, Cottonwood) on the Copper Canyon Allotment using two pastures (Monroe, Lucky) in conjunction with the main pastures while keeping the Tompkins Pasture in winter use only.
 - f. Maintain management on the Squaw Peak Allotment as a whole since topography does not lend itself to division into pastures. Defer areas from grazing on the lower part of the allotment by using only one water pipeline at a time. Either the North Mine Spring pipeline or the Lower Mine Spring pipeline will be shut off each growing season (spring or summer) to allow the area serviced by the pipeline to be rested.
 - g. Maintain existing management on the Young Allotment using the allotment during the winter/spring months (January – April) and occasionally the fall months (October – November). Provide deferment by avoiding grazing during the same growing season more than two years in a row.
 - h. Establish utilization levels on Bald Hill and Copper Canyon Allotments of:
 1. 40% use of current year's production on key forage species during periods of growth and 50% during non-growth periods maintaining 70% of height on herbaceous riparian species after the growing season.
 2. 50% use of current year's production on upland browse species.
 3. 20% use of current year's production on riparian browse species.
 - i. Establish utilization levels on Squaw Peak Allotment of:
 1. 30% of current year's production on key forage species during periods of growth and 50% during non-growth periods.
 2. 50% use of current year's production on upland browse species.

- j. Establish utilization levels on Young Allotment of:
 1. 40% use of key forage species.
2. Use fencing, prescribed burning, and juniper cutting to maintain/improve riparian conditions, vegetative ground cover, and watershed conditions.
 - a. Extend the riparian enclosure on Cienega Creek in the Bald Hill Pasture (Bald Hill Allotment) north to the division fence, while leaving access for cattle watering.
 - b. Extend the riparian enclosure at Reimer Spring in the Bald Hill Pasture (Bald Hill Allotment) downstream, while leaving access for cattle watering.
 - c. Conduct juniper reduction on approximately 2,560 acres on the Bald Hill Allotment using a combination of hand and mechanical felling to improve watershed conditions through increased growth and spread of vegetative ground cover.
 - d. Conduct juniper reduction on approximately 147 acres in the Copper Canyon and Tompkins Pastures of Copper Canyon Allotment using a combination of hand and mechanical felling to increase growth and spread of vegetative ground cover.
 - e. Prescribe burn approximately 909 acres in the Copper Canyon Pasture (Copper Canyon Allotment) to reduce prickly pear cactus, juniper, and mesquite in order to sustain existing herbaceous ground cover.
 - f. Conduct juniper reduction on approximately 1,061 acres in the Squaw Peak Allotment using a combination of hand and mechanical felling to increase growth and spread of vegetative ground cover.
3. Construct $\frac{3}{4}$ mile of fence on the Bald Hill Allotment to re-create the small pasture (Horse) south of the private land for bulls, heifers, and/or cattle shipping.

Decision Framework:

The Verde District Ranger, as the responsible official for the Bald Hill, Copper Canyon, Squaw Peak, and Young Allotments, will decide:

- a. Whether to authorize continued livestock grazing on the Verde Rim Livestock Grazing Project allotments.
- b. If livestock grazing is authorized, which management practices and mitigation measures will be prescribed in the Allotment Management Plans, including permitted livestock stocking, season of use, livestock facilities to be constructed, and term of the permits.

- c. Whether the selected alternative may have significant environmental effects and whether to prepare an Environmental Impact Statement.

Separate decisions may be made for each allotment or for all four allotments, combined.

In accordance with Forest Service Handbook direction [FSH 1909.15(18)] an interdisciplinary review of the decision will occur within 10 years or sooner if conditions warrant. If this review indicates that management is meeting standards and achieving desired conditions, the initial management activities will be allowed to continue. If monitoring demonstrates that management options beyond the scope of the analysis are warranted, or if new information demonstrates significant effects not previously considered, further analysis under the National Environmental Policy Act will occur. Future physical improvements not disclosed or analyzed herein would require site-specific analyses and decisions.

Public Involvement:

This project has been listed in the Prescott National Forest's Schedule of Proposed Actions (SOPA) since October 1998 through to the most recent release.

Initial scoping of affected grazing permit holders was initiated in August 1997 in preparation for annual permittee meetings that were scheduled and held during October – March 1997-1998 (PR# 2,3). Scoping of internal resource specialists began under letter of October 19, 1998 establishing an interdisciplinary team and continued with the development of a project cover sheet in August 2001 (PR#4, 18). This scoping process was used to define the size and dimension of the proposal, determine the complexity of the analysis and to identify management concerns. The timeline for completion of the analysis was extended to better analyze the effects of the ongoing drought, and to determine an attainable herbaceous potential for these allotments.

Information on existing conditions was collected during 1999-2001 and was used by the Interdisciplinary Team (ID Team) to develop a proposed action for each allotment utilizing the field data and permittee input garnered from annual grazing validation meetings and field monitoring meetings. The proposed actions were combined into a single proposed action for the entire project area and sent to 41 individuals, organizations, State and Federal agencies, and affected permittees for review and comment in January 2002 (PR#32). Three individuals, three organizations, one State and one Federal agency responded. No affected permit holders formally responded.

The ID Team reviewed all the letters received and prepared a "response to comments" document along with an outline of alternatives (PR#s 61, 62). These documents were sent out to the respondents and affected permit holders in September 2002 (PR#63, 64). The affected permit holders were not among the few who responded to this document, either.

Permittees, however, have chosen to be informally involved in the analysis through the annual grazing validation meetings and field monitoring meetings rather than utilizing the more formal process.

In late June 2004, a request for comments package (PR#79) was sent to the 8 scoping respondents, the 4 affected permit holders, and potentially interested Native American Tribes. Ten comment letters were received (PR#s 83 through 92). The ID Team reviewed and considered the comments in early August 2004 (PR# 93). Comments were used to complete Chapter 3 of the EA (PR#98).

As the result of having subsequent decisions reversed by the Forest Supervisor a second comment period was conducted in March 2005. The comment package (PR#111) was sent to 15 interested parties and agencies including the 4 affected permit holders. Addendum letters informing the potentially interested Tribes of the changes made to the original June 2004 comment package were also sent (PR#112). Five comment letters were received (PR#s 120 through 124). The Acting District Ranger, Acting Forest Range - Soil/Water - Ecology Team Leader, Forest NEPA Coordinator, and the project ID Team Leader reviewed and considered the comments in early May 2005. Comments were used to complete Chapter 3 and make editing changes to the other parts of the assessment (PR#125).

Public Issues: (PR# 61)

Public issues were determined by comparing all comments to the definition of an issue: *An expression of a dispute, debate, or discussion regarding the Proposed Action based upon some anticipated environmental effect.*

Three public issues significant to the analysis were identified:

- 1) The proposed utilization levels would result in long-term degradation of resources.

Note: Utilization was used in the scoping document in an inappropriate context on the Copper Canyon and Bald Hill Allotments where rotation grazing is practiced. Allowable use is the correct term. Utilization is, however, appropriate for Squaw Peak and Young Allotments

Definitions of the two terms are:

Utilization (*syn. Use*) – *The proportion (usually expressed as a percent) of the total current year's forage production that is consumed or destroyed by grazing animals (Glossary of Terms used in Range Management, SRM 1998). Utilization is measured at the end of the current year's growing season and is a measure of total use.*

Allowable use (relative use, seasonal use) – *the degree of use considered desirable and attainable considering the present resource condition, management objectives, and management level (USDA Forest Service R3 1997). Allowable use allows you to gauge use in a pasture and rotate between pastures prior to the removal of all the growth during a growing season. Additional growth is allowed to take place prior to any re-entry.*

- 2) Riparian area protection is not adequate and would result in loss of important habitat.
- 3) Controlling livestock access to water to defer areas from grazing on the Squaw Peak Allotment will not be successful, resulting in overuse of resources.

Although some confusion resulted from the unintended use of the term utilization, the ID Team still considered Item 1 above to be a public issue that was significant to the analysis process and therefore was used to determine alternatives to the proposed action.

Issues not significant to the analysis are those that are:

- Outside the scope of the Proposed Action
- Already decided by law, regulation, Forest Plan or higher level decision
- Irrelevant to the decision to be made
- Conjectural and not supported by scientific fact

No non-significant public issues were identified from public scoping.

CHAPTER 2 - ALTERNATIVES INCLUDING THE PROPOSED ACTION

Development of Alternatives

Monitoring of resource conditions throughout the project area coupled with input from affected permit holders helped define the size and dimension of the analysis and resulted in a proposed action. The Proposed Action (now contained in Alternative 3) was finalized and scoped with both the affected permit holders and the public in January 2002 (PR# 32).

Following this scoping effort, three public issues were identified (PR# 61) concerning the proposed allowable use/utilization levels, riparian area use, and controlling livestock water access to defer areas from grazing (Squaw Peak Allotment only).

In response to these issues and public scoping input, two alternatives to the Proposed Action were developed: One incorporated a reduced allowable use/utilization level, additional riparian fencing on Bald Hill Allotment and waterlot construction around troughs and pipeline overflow area on Squaw Peak Allotment. The second used a seasonal grazing strategy with the same riparian fencing and waterlot construction as the first.

In 2003, the effects of the prolonged draught began to manifest itself through out the Forest. On the Verde Rim allotments desirable plants on all aspects began to show signs of drought stress and experience mortality. In response to this and similar forest-wide effects, a stocking/use strategy was developed to help adjust livestock management (PR#127) within the confines of the livestock grazing permit. In keeping with this strategy stocking on the Verde Rim allotments was approximately 40% the permitted numbers in 2002 to the present.

In February 2004, a change in Forest Service direction encouraged consideration of an adaptive management strategy for livestock grazing (USDA Forest Service 2004a). This change led to the creation of a Modified Proposed Action that incorporated many of the elements of the earlier

alternatives and the decision to not carry the Seasonal Grazing Alternative forward for detailed analysis.

Description of Alternatives

Five alternatives were considered in detail including the original Proposed Action. The following describes the design of the alternatives. Mitigation measures and monitoring needs follow the alternative descriptions. Alternative maps are located in Appendix 4.

Alternatives 3 (Proposed Action), 4 (Modified Proposed Action), and 5 (Reduced Utilization) incorporate management flexibility by providing for annually authorizing stocking based on monitored resource conditions. Actual stocking would then be designated in the Annual Operating Instructions (AOI) and authorized in the Bill for Collection and may be less than permitted numbers on a year by year basis. Adjustments may be made as weather dictates or if resources are affected by natural conditions, such as drought, [Term Grazing Permit, Part 2. *General Terms and Conditions* - 8(b)].

Alternatives 3 (Proposed Action), 4 (Modified Proposed Action), and 5 (Reduced Utilization) propose both structural and non-structural range improvements which would become a part of any new permit issued. The US Forest Service financial contribution to these proposed improvements and restoration is not yet determined. Any US Forest Service contributions would be defined by multi-year range program priorities across the Prescott National Forest, and would be based on resource need and other opportunities for funding such as grants from organizations and other agencies.

Adaptive management includes adjustments to management as resource conditions fluctuate. Adaptive management includes:

- Changing timing, such as entering a pasture later in the season or resting a pasture.
- Changing intensity by adjusting stocking levels or utilization levels
- Changing duration by adjusting distribution or resting a pasture.
- Constructing drift fences in Copper Canyon to control access to Desert Shrub formation (TES 368) in the drainage and to control movement between the north and south end of the pasture, if needed to achieve resource and/or Southwestern Willow Flycatcher buffer zone mitigation objectives.
- Constructing a cross fence in Lucky pasture to create north and south units to control livestock access to TES 368, if needed to achieve resource objectives.
- Constructing additional fencing in the Copper Canyon drainage to protect known riparian areas if a winter use only management strategy is ineffective.
- Constructing additional fencing of areas having riparian potential but not currently showing riparian vegetation or in identified riparian areas not currently grazed on the Bald Hill and Copper Canyon Allotments, if needed to achieve resource objectives.

- Thinning as much as 100 acres of juniper in the watershed immediately above Squaw Peak Tank to reduce sediment flow into the tank and increase available water storage, if livestock can not be held long enough in the higher elevation grazing area to achieve deferment in the lower grazing areas.

At the end of this chapter, the alternatives are presented in comparative form (Table 2.6) to show how they address the purpose and need, significant public issues, relevant Forest Plan direction, and other key environmental effects. The implementation process for adaptive management is discussed in the monitoring section (pages 2-7, 2-8).

Alternative 1: No Action (No Livestock Grazing)

This alternative is responsive to Forest Service policy (USDA Forest Service 2004b) implementing the National Environmental Policy Act that requires analysis of a “no action” alternative.

Table 2.1 – No Action (No Livestock Grazing)

Management Parameter	Allotment			
	<i>Bald Hill</i>	<i>Copper Canyon</i>	<i>Squaw Peak</i>	<i>Young</i>
<i>Permitted Stocking (animal Months)</i>	None – existing permits cancelled and not re-issued			
<i>Season of Use</i>	No livestock use			
<i>Number of Pastures / Grazing System</i>	None			
<i>Forage and Browse Utilization</i>	None – No livestock grazing			
<i>Riparian Area use</i>	None – No livestock grazing			
<i>Range Structural Improvements</i>	Interior fences would be removed or gaps created. Maintenance responsibility for interior allotment boundary fences would be transferred to adjacent permit holder. The Forest Service would accept maintenance responsibility for retained water developments.			

Alternative 2: Current Management

This alternative is the continuation of current management on each of the four allotments comprising the project. The current management strategies are described below.

Table 2.2 – Current Management

Management Parameter	Allotment			
	<i>Bald Hill</i>	<i>Copper Canyon</i>	<i>Squaw Peak</i>	<i>Young</i>

Permitted Stocking (animal Months)	2064	960 - 1200	Up to 1080	Up to 108
Season of Use	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31
Number of Pastures / Grazing System	4 (+2 small intermittently used) / Deferred (Arnold Pasture winter-use)	4 (+2 small holding) / deferred (Tompkins Pasture winter-use)	Allotment as a whole – 3 grazing areas / deferment of areas by herding	Allotment as a whole / Deferred from grazing the same growing season more than 2 years in a row
Allowable use (indicator for pasture moves)	40%	40%	Allotment is managed as a whole – no pastures	Allotment is managed as a whole – no pastures.
Forage Utilization (end of growing season)	50%	50%	50%	40%
Browse Utilization	50% current year’s production on available leaders	50% current year’s production on available leaders	50% current year’s production on available leaders	No browse available
Riparian Area Use	20% current year’s growth	20% current year’s growth	20% current year’s growth	No riparian areas
Range Structural Improvements and Vegetation Treatments	None	None	None	None

Alternative 3: Proposed Action

This alternative is the publicly scoped action and is designed to:

- Provide for some adaptive management
- Include juniper treatments for watershed improvement
- Improve riparian area protection with additional fencing

Presentation of this alternative has been altered to conform to that of the other alternatives so comparisons can be made. See Project Record (PR#32) to view the alternative as presented for public scoping.

Table 2.3 – Proposed Action

Management Parameter	Allotment			
	<i>Bald Hill</i>	<i>Copper Canyon</i>	<i>Squaw Peak</i>	<i>Young</i>
Permitted Stocking (animal Months)	1560 - 2064	960 - 1200	Up to 720	Up to 108
Season of Use	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31
Number of Pastures / Grazing System	4 (+2 small intermittently used) / Deferred (Arnold Pasture winter-use)	4 (+2 small holding) / deferred (Tompkins Pasture winter-use)	Allotment as a whole – 3 grazing areas / deferment of areas by control of water access	Allotment as a whole / Deferred from grazing the same growing season more than 2 years in a row

Allowable use (indicator for pasture moves)	40%	40%	30% - Allotment would be managed with 3 grazing areas.	Allotment would be managed as a whole – no pastures.
Forage Utilization (end of growing season)	50%	50%	50%	40%
Browse Utilization	50% current year's production on available leaders	50% current year's production on available leaders	50% current year's production on available leaders	No browse available
Riparian Area Use	20% current year's growth	20% current year's growth	20% current year's growth	No riparian areas
Range Structural Improvements and Vegetation Treatments	Extend riparian enclosure on Cienega Creek, and at Remer Spring; Conduct 2560 acres of juniper removal for watershed improvement; ¾ mile of fence	No new range structures; Conduct 147 acres of juniper control for watershed improvement; Conduct 909 acres of prescribed burning to enhance VGC	No new range structures; Conduct 1061 acres of juniper control for watershed improvement	None

Alternative 4 – Modified Proposed Action

This alternative is the publicly scoped action modified to:

- Provide for adaptive management
- Remove juniper treatments since these treatments were not intended to improve grazing management, which is the scope of this project.
- Be responsive to the public issues dealing with riparian area protection and deferment of grazing areas through additional fencing

This alternative also adjusts allowable use or utilization in areas where an increase in grass cover and/or composition may require a change in grazing effects.

Table 2.4 – Modified Proposed Action

Management Parameter	Allotment			
	<i>Bald Hill</i>	<i>Copper Canyon</i>	<i>Squaw Peak</i>	<i>Young</i>
<i>Permitted Stocking (animal Months)</i>	1495 - 2064	840 - 1200	540 - 720	Up to 108
<i>Season of Use</i>	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31
<i>Number of Pastures / Grazing System</i>	4 (+2 small intermittently used) / Deferred (Arnold)	4 (+2 small holding) / deferred (Tompkins Pasture)	Allotment as a whole – 3 grazing areas / deferment of	Allotment as a whole / Deferred from grazing the

	Pasture winter-use)	winter-use)	areas by control of access to water and herding	same growing season more than 2 years in a row
Allowable use (indicator for pasture moves)	40% (30% in Bates and Bull Pastures)	40% (30% in Cottonwood Pasture)	25% - Allotment would be managed with 3 grazing areas.	Allotment would be managed as a whole – no pastures.
Forage Utilization (end of growing season)	50% (30% in Bates and Bull Pastures)	50% (30% in Cottonwood Pasture)	25%	40%
Browse Utilization	50% current year's production on available leaders	50% current year's production on available leaders	40% current year's production on available leaders	No browse available
Riparian Area Use	Riparian areas fenced	20% current year's growth	No riparian areas grazed	No riparian areas
Range Structural Improvements and Vegetation Treatments	Extend riparian enclosure on Cienega Creek, and at Remer Spring; Construct riparian enclosures adjacent to the private land on Cienega Creek and along Arnold Canyon; ¾ mile of fence; No vegetation treatments	No new range structures; Conduct 550 acres of prescribed burning to enhance VGC	Construct waterlots at ends of North and Lower Mine Spring pipelines; No Vegetation treatments	None

Alternative 5: Reduced Utilization

This alternative is designed to:

- Be responsive to public issues dealing with utilization (and allowable use), riparian area protection, and deferment of grazing through additional fencing
- Provide for adaptive management

Table 2.5 – Reduced Utilization

Management Parameter	Allotment			
	<i>Bald Hill</i>	<i>Copper Canyon</i>	<i>Squaw Peak</i>	<i>Young</i>
Permitted Stocking (animal Months)	1170- 1548	720 - 900	540 - 720	Up to 108
Season of Use	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31
Number of Pastures / Grazing System	4 (+2 small intermittently used) / Deferred (Arnold Pasture winter-use)	4 (+2 small holding) / deferred (Tompkins Pasture winter-use)	Allotment as a whole – 3 grazing areas / deferment of areas by control of access to water and herding	Allotment as a whole / Deferred from grazing the same growing season more than 2 years in a row
Allowable use	30%	30%	25% - Allotment	Allotment would be

<i>(indicator for pasture moves)</i>			would be managed with 3 grazing areas.	managed as a whole – no pastures.
Forage Utilization (end of growing season)	30%	30%	25%	30%
Browse Utilization	30% current year's production on available leaders	30% current year's production on available leaders	25% current year's production on available leaders	No browse available
Riparian Area Use	Riparian areas fenced	20% current year's growth	No riparian areas grazed	No riparian areas
Range Structural Improvements and Vegetation Treatments	Extend riparian enclosure on Cienega Creek, and at Remer Spring; Construct riparian enclosures adjacent to the private land on Cienega Creek and along Arnold Canyon; ¾ mile of fence; No vegetation treatments	No new range structures; Conduct 550 acres of prescribed burning to enhance VGC	Construct waterlots at ends of North and Lower Mine Spring pipelines; No Vegetation treatments	None

Mitigation Measures

These mitigation measures are incorporated into Alternatives 3, 4 and 5.

Soil and Water

The object is to mitigate soil and water impacts from livestock grazing. Best Management Practices for soil and water protection would apply to the Proposed Action and would be incorporated into the allotment management plans (See Appendix 1 – BMPs). Practices include but are not limited to:

- *Preparation of an annual operating procedure with the permittee to allow for consideration of current allotment conditions and management objectives.*
- *Periodic field checks to identify needed adjustments in season of use and livestock numbers, forage utilization, assessment of rangeland to verify soil function, vegetation health and trend.*
- *Application of standard practices such as salting, herding, and controlling access to water to achieve proper distribution or lessen the impact on areas which are sensitive or are natural concentration areas*
- *Grazing pastures with riparian ecosystems primarily during plant dormancy periods or constructing/maintaining riparian enclosure fencing.*

Wildlife/Rare Plants

Wildlife/Rare Plants mitigation measures are important to maintain wildlife habitat and population needs. Relevant mitigation measures include the following:

- No troughs or mineral supplements would be placed within ¼ mile of any identified sensitive plant population and no new improvements (e.g. pipelines, tanks, or fences) would go through any such population.
- All new or reconstructed fencing would be built to accommodate wildlife passage using a 4-strand fence with a smooth bottom wire 16 inches off the ground and a total fence height of 42 inches or less.
- All new or reconstructed water developments would include wildlife access and escape ramps.
- Livestock use in Copper Canyon Pasture (Copper Canyon Allotment) and the Young Allotment would be restricted during an April 1 – July 31 time period each year to provide a cowbird buffer zone for the Southwestern Willow Flycatcher.
- Cooperate with permittees to make stock water supplies available for wildlife needs during critical periods, if water is available at the sources (e.g. storage tank) and livestock rotations would not be disrupted.

Monitoring

Implementation of Adaptive Grazing Management

Monitoring would be used to determine current resource status and to ensure the allotment management plan and other terms of the permit are being followed. Monitoring would also be used to determine whether the actions are effective in achieving or moving toward desired conditions.

Short-term monitoring would be conducted using tools such as the Rangeland Health Checklist which documents utilization levels and short-term indicators of rangeland health in key areas. This checklist would be used to determine if adjustments in stocking, duration of grazing, or the season of use are needed. Utilization monitoring would be consistent with methods in the Interagency Technical Reference - Utilization Studies and Residual Measurements (USDI 1996).

If short term monitoring indicate concerns that movement towards desired conditions is not likely, annual changes in management may be made. Changes in management can include modifying annual authorized livestock numbers, duration season of use, class of animal, or other modifications within the outer limits of the timing, intensity, duration, and frequency defined for the proposed action. Rangeland Health Checklists will be used with short term monitoring.

Long-term monitoring tracks whether the actions are effective in achieving or moving toward desired project objectives, i.e. plant diversity, soil function, and riparian vegetation potential. Monitoring would be consistent with methods in the Interagency Technical Reference - Sampling Vegetation Attributes (USDI 1996), Proper Functioning Condition (USDI 1998), Soil Condition field evaluation form and Forest Service Handbooks.

If long-term monitoring indicates that desired conditions are not being achieved, changes in management would be implemented. Changes may include lowering allowable grazing intensity for that unit, increasing rest from grazing or reducing permitted numbers. Long term monitoring results combined with actual use would be used to validate and refine term permitted numbers.

Other Alternatives

Alternative Considered but Eliminated from Detailed Study.

One alternative was considered and dismissed from detailed consideration:

Seasonal Grazing – This alternative proposed by a scoping responder would reduce the current year-round grazing to a September through March season each year for all allotments in the project and would restrict entry into any pasture until such time as the key forage species have re-grown to pre-entry height.

While this alternative addresses resource concerns, it is not feasible to implement due to the lack of management flexibility and adverse economics.

- The defined season lacks management flexibility to adjust operations to meet resource needs.
- The permittees involved do not have a sufficient private land base to which they could move permitted cattle numbers from the Forest for the prescribed 5 months.
- The steer market is so highly volatile that without access to feedlots, the strict off dates would make it impossible to adjust selling at reasonable prices.

Comparison of Alternatives

The following table compares alternatives with respect to the purpose and need, significant public issues, Forest Plan guidance, and other key environmental effects for the alternatives developed in detail.

Table 2.6 – Comparison of Alternatives

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Purpose and Need					
-Authorize Grazing	No livestock grazing – existing permits cancelled.	Yes – Current permit grazing parameters continue.	Yes – New permits issued with reduced utilization on Squaw Peak and additional fencing on Bald Hill.	Yes – New Permits issued with reduced utilization levels on Squaw Peak and pastures on Copper Canyon and Bald Hill and additional fencing on both Squaw Peak and Bald Hill.	Yes – New permits issued with reduced allowable use levels, and additional fencing on both Squaw Peak and Bald Hill.
-Increase or maintain VGC, perennial grass composition and cover: Pinyon/Juniper Communities	Greatest rate of improvement to VGC. Grass composition would gradually improve to attainable potential where woody cover is not limiting.	VGC and composition would remain below attainable potential on approximately 11% of ecotype* impacted by dense juniper cover. Approximately 25% of ecotype would continue to have less VGC than attainable potential but may have improved composition by grasses on areas not impacted by high juniper cover.	VGC and grass composition would be improved by juniper thinning on about 14% of ecotype*. Improvement would be limited because grazing intensity would only decrease slightly over Alternative 2. On the untreated sites VGC and grass composition would move towards attainable potential on approximately 4% of ecotype* due to reduced stocking.	Reduced allowable use would move VGC and grass composition towards attainable potential on 8% of ecotype* but other areas would continue to limit VGC and grass composition.	Lower allowable use on portions of approximately 36% of ecotype* would improve VGC, grass composition and move conditions towards attainable potential where high juniper cover is not limiting production.

- Portions of this map unit are not expected to change due to factors outside the scope of this assessment including canopy cover and activities other than livestock grazing.

Table 2.6 – comparison of Alternatives (Cont)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Purpose and Need (Cont)					
-Desert shrub/ Grassland Community	Greatest rate of improvement to VGC and grass composition where inherent ecosystem characteristics are not limiting. Similar to Alternative 4 and 5 but at a faster rate of improvement. However, this alternative does not call for prescribed fire, and VGC and grass composition would continue to decline on 550 acres.	VGC and grass composition would remain static and areas below attainable potential would remain the same	VGC and grass composition would improve on prescribed fire areas but would be limited because grazing intensity would only decrease slightly. The remainder of the untreated sites VGC and grass composition would remain similar to Alternative 2 with a slight improvement.	Similar prescriptions as Alternative 3 with a further reduction in grazing intensity which would improve VGC and grass composition over Alternative 3.	Similar prescriptions as Alternative 4 with a slightly lower reduction in grazing intensity which would improve VGC and grass composition over Alternative 4.
-Chaparral Community	VGC and grass composition where inherent ecosystem characteristics are not limiting would improve gradually to attainable potential.	VGC and grass composition would remain static on 17% of ecotype* on Squaw Peak. Remainder would not change. Soil conditions would remain variable and degraded areas would continue to degrade.	VGC and grass diversity would improve on 17% of ecotype*. Remainder would not change.	Similar to Alternative 1 but at a slower rate.	Same as Alternative 4

* Portions of this map unit are not expected to change due to factors outside the scope of this assessment including canopy cover and activities other than livestock grazing.

Table 2.6 – Comparison of Alternatives (cont)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Purpose and Need (cont)					
- Improve soil function to enhance soil conditions	Overall, soil condition would improve at the greatest rate.	Soil conditions would remain variable and degraded areas would continue to degrade	Soil Conditions would have the greatest improvement on the grassland prescribed fire sites and the juniper treatment areas. However, potential improvement would be limited because livestock grazing would decrease only slightly over Alternative 2. The remainder of the untreated soils would remain similar to Alternative 2 with a slight improvement	The reduced allowable use on all ecosystems and the reduction of desert shrub canopy on 550 acres would improve overall soil conditions.	Same prescriptions as identified in Alternative 4 with a further reduction in grazing intensity would result in a minimal to moderate improvement of soil conditions over Alternative 4.
-Allow riparian vegetation to reach or move toward potential	Responded to below under Significant Public Issues and Forest Plan Compliance				
-Allow channel profiles to return to appropriate dimensions for site morphology and channel function	Excluding cattle would lead to gradual return of channel profile and function throughout analysis area.	Channel conditions direction would continue. Degraded areas would contribute to a decline of channel function.	Reduction of juniper and desert shrub canopy would reduce runoff and sediment movement from uplands. Riparian fencing and changes to winter use would lead to reduced grazing impacts.	Riparian fencing beyond that in Alt 3 and changes to winter grazing in some areas would lead to a gradual return of channel profile and function in affected sections. No decrease in upland sediment and water transport.	Same as Alternative 4

Table 2.6 – Comparison of Alternatives (cont)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Significant Public Issues					
-Proposed Utilization / allowable use levels would result in long- term decline of resources	Forage plants would grow without being grazed by livestock. Decline of resources attributed to grazing would cease.	Approximately 14% of project area would remain below levels predicted by TES for VGC and species richness. 28% of project area* is deficient in VGC and/or species richness. Current allowable use/management would continue current trends	Resource conditions are stable but some areas are below potential with limited buffering from decline. Lower stocking would reduce, but not eliminate, the area impacted by grazing.	Resource conditions would remain stable but some areas are below potential with limited buffering from decline. Lower allowable use would reduce, but not eliminate, the areas impacted by grazing	Allowable use levels would sustain or improve long-term resource conditions. Some areas would remain below attainable potential.
- Riparian area protection is not adequate and would result in loss of important habitat	Riparian areas would no longer be affected by livestock and riparian habitat would improve.	Riparian vegetation and habitat quality would continue to be impacted by grazing. Riparian would not develop to potential in these areas.	Fencing or winter season grazing would improve riparian habitat.	Additional fencing would lead to a greater extent of riparian habitat improvement than Alternative 3.	Same as Alternative 4.
-The use of water access to defer areas on Squaw Peak will not be successful	Not applicable	There would be periods when there is insufficient water to defer grazing at current stocking.	Similar to Alternative 2	Lower stocking and waterlot construction would greatly improve deferred grazing.	Same as Alternative 4

Table 2.6 – Comparison of Alternatives (cont)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Forest Plan Compliance					
<i>Forest – wide:</i>					
-Provide forage for grazing and browsing animals to the extent benefits are relatively commensurate with costs without impairing land productivity. <i>(Pg. 12 of LMP -2004 republished version)</i>	Forage would not be provided for livestock. There would be no risk of impairing land productivity through grazing management.	Forage is provided for livestock. Current trends in productivity related to livestock impacts would continue.	Forage is provided for livestock. Current trends in productivity related to livestock impacts would continue.	Forage is provided for livestock. Reduced allowable use in impacted areas and adaptive management provide tools to improve areas adversely affected by grazing.	Same as alternative 4 with some additional improvement in impacted areas where allowable use is not reduced
-Maintain and/or improve habitat for T&E species and work toward recovery <i>(Pg. 13 of LMP - 2004 republished version)</i>	There is no occupied or potential habitat in the project area for any T&E species and therefore not applicable to this analysis.	.			
-Improve all riparian areas and maintain in satisfactory condition <i>(Pg. 14 of LMP – 2004 republished version)</i>	Riparian areas impacted by livestock would improve	Riparian areas within enclosures would continue to improve. Livestock impacts outside enclosures would continue to degrade riparian areas.	Functional at risk locations are to be fenced or would have winter use only resulting in riparian improvement.	Livestock grazing impacts would be reduced to a greater extent than Alternative 3 as there is additional fencing of riparian habitats.	Same as Alternative 4

Table 2.6 – Comparison of Alternatives (cont)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Forest Plan Compliance (Cont)					
<i>Relevant Management Area (MA)</i>					
MA 2 – Woodland:					
-High chaparral and Pinyon/juniper = Management seeks uniform livestock distribution and use of forage allocated to livestock (pgs 56, 125 of LMP-2004 republished version)	There would be no livestock grazing, therefore there would not be any livestock management needs.	Distribution is affected by steep slopes, dense overstory woodland vegetation, causing cattle concentrations around water sites and on gentler slopes	Riparian area fencing with off site water, water site fencing, juniper overstory removal, and some pasture entry changes to winter use will benefit distribution and allow for more even use of available forage.	Same as Alternative 3 except there would not be as great an opportunity for wider distribution since juniper overstory is not reduced	Same as Alternative 4
MA 5 – Desert Grassland:					
Low chaparral, desert shrub, grassland = Management seeks to realize maximum livestock production and utilization of forage allocated to livestock (pg 64-65, 125 of LMP – 2004 republished version)	There would be no livestock grazing, therefore there would not be any livestock management needs.	Historically these areas have been highly utilized by livestock causing some decreases in grass diversity and soil conditions associated with increases in shrub cover. Current management would tend to maintain the existing conditions.	With combinations of reduced stocking, area grazed, and prescribed burning vegetative conditions are expected to improve and proposed permitted numbers to be maintained.	Same as Alternative 3	Same as Alternative 3

Table 2.6 – Summary of Effects (continued)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Forest Plan Compliance (Cont)					
MA 6 - Wilderness					
All vegetation types = Manage livestock grazing to ensure that the maintenance of wilderness character and values are not diminished (pg 68 of LMP-2004 republished version)	No livestock grazing, therefore there would be no livestock impacts to wilderness values	Livestock grazing is limited due to steep slopes and the lack of reliable water. Light use on vegetation and highly dispersed livestock would not detract from the wilderness character nor diminish its value	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
MA 7 – Recreation:					
Verde Scenic River (Beasley Flat day-use/river access area) = No grazing capacity to be assigned (Pg 70 of LMP – 2004 republished version)	No livestock grazing. Entire area is fenced	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1

Table 2.6 – Summary of Effects (continued)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Other Key Environmental Effects					
Watershed Health	With cattle removal, watershed health would slightly improve in areas where woody cover is not a concern.	Watershed conditions would remain unchanged. Degraded areas would limit improvement of watershed health	Reduction of juniper and desert shrub canopy would reduce runoff and sediment movement from treated acres. Watershed health would improve in treated areas greater than for Alternatives 1 and 2	Watershed health would move towards stabilization.	Watershed health would improve similar to Alternative 1, but at a slower rate of improvement.
Wildlife and Rare Plants: T,E & S Species:	With no livestock grazing, riparian and desert shrub habitats would be maintained and/or improved and may increase local populations of Lowland leopard frog, Arizona toad, Mearns sage, Hualapai milkwort	There is no occupied or potential habitat in the project area for any T&E species. Continued livestock grazing impacts to some riparian and desert shrub habitats may limit local populations of Lowland leopard frog, Arizona toad, Mearns sage, Hualapai milkwort	There is no occupied or potential habitat in the project area for any T&E species. Fencing would improve riparian habitats and may increase local populations of Lowland leopard frog, Arizona toad. Improved distribution and control of grazing in desert shrub habitats would maintain local populations of Mearns sage and Hualapai milkwort	There is no occupied or potential habitat in the project area for any T&E species. Fencing would occur in more locations than Alternative 3, improving more riparian habitats and may increase local populations of Lowland leopard frog, Arizona toad. Same as Alternative 3 for Mearns sage and Hualapai milkwort populations	Same as Alternative 4

Table 2.6 – Summary of Effects (continued)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Other Key Environmental Effects (cont)					
MIS	With no livestock grazing, riparian habitats would be maintained and/or improved and may increase local populations of Lucy’s warbler. There would be no change in seral stages of habitat for mule deer and juniper titmouse and therefore no change in populations.	Continued livestock grazing impacts to some riparian habitats may limit local populations of Lucy’s warbler. There would be no change in habitat for mule deer or juniper titmouse and thus no change in populations.	Juniper thinning would alter seral stage of PJ habitats, may increase local population of mule deer because of increased forage production; may decrease local population of juniper titmouse because of loss of mature trees for nesting. Continued livestock grazing impacts to some riparian habitats may limit local populations of Lucy’s warbler.	Seral stage of PJ habitat would be maintained. No change to mule deer or juniper titmouse populations. Riparian habitats would be maintained and/or improved thru fencing or winter use and may increase local populations of Lucy’s warbler.	Same as Alternative 4
Migratory Birds	With no livestock grazing, riparian habitats would be maintained and/or improved and may increase local populations of Lucy’s warbler and reduce Southwestern willow flycatcher (SWWF) brood parasitism from brown-headed cowbirds (BHC).	Continued livestock grazing impacts to some riparian habitats may limit local populations of Lucy’s warbler and contribute to potential BHC parasitism of SWWF brood.	Fencing would improve riparian habitats and may increase local populations of Lucy’s warbler and maintenance of a 2-mile buffer zone during SWWF nesting would reduce potential parasitism to negligible levels.	Fencing would occur in more locations than Alternative 3, improving riparian habitats and may increase local populations of Lucy’s warbler and maintenance of a 2-mile buffer zone during SWWF nesting would reduce potential parasitism to negligible levels.	Same as Alternative 4

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

This Chapter describes the present condition within the project area, how each alternative addresses the issues raised during scoping and the environmental effects of each alternative.

RESPONSES TO THE SIGNIFICANT ISSUES

The significant issues identified during scoping (Chapter 1) are:

- 1. The concern that the proposed utilization levels of 40 to 50% are too high and will eventually lead to resource degradation.*
- 2. The concern that riparian area protection is not adequate and would result in loss of important habitat.*
- 3. The concern that controlling livestock access to water to defer areas from grazing on the Squaw Peak Allotment will not be successful, resulting in overuse of resources.*

Issue 1 – Proposed utilization levels are too high:

Alternative 1 – No Action (No grazing):

Under this alternative there would be no livestock grazing, so utilization by livestock would be zero. Forage plants would grow without being grazed by livestock. Any decline of resources attributed to livestock would cease. However, any decline/increase due to natural processes (e.g. drought) would continue.

Alternative 2 – Current Management:

Under this alternative the current allowable use/utilization levels of 30% - 40% growing season and 50% non-growing season would remain. Approximately 14% of the project area would remain below levels predicted by Terrestrial Ecosystem Survey for vegetative ground cover. Cover and species richness and current trends in the rest of the area would remain static.

Alternative 3 – Proposed Action:

Under this alternative the allowable use/utilization levels would be the same as current management. Effects would be similar to Alternative 2 but there would be better distribution of use because of the proposed management actions. As with Alternative 2, with continued drought, there would be continued decline due to natural processes.

Alternative 4 – Modified Proposed Action:

Under this alternative allowable use/utilization would generally be maintained at the moderate level (40%) for three of the four allotments. There would be reduced allowable use/utilization in the two small pastures of Bald Hill and all of Squaw Peak. This alternative would be more likely to improve the vegetation and soil resources under favorable climatic conditions and possibly maintain these resources in droughts.

Alternative 5 – Reduced Utilization:

Under this alternative allowable use/utilization levels would be reduced to 25% -30%. Lower allowable use/utilization levels would sustain or improve long term resource conditions.

ISSUE 2 – Riparian Area protection is not adequate:**Alternative 1 – No Action**

Under this alternative there would be no livestock grazing so utilization by livestock would be zero. Forage plants would grow without being grazed by livestock. Any decline of resources attributed to livestock would cease.

Alternative 2 – Current Management

Under this alternative riparian vegetation and habitat quality would continue to be impacted by grazing. Areas with riparian potential not currently excluded from livestock grazing would not develop to their potential.

Alternative 3 – Proposed Action

Under this alternative increased fencing and implementation of winter-use only pastures would improve potential and existing riparian. Some areas where livestock use would continue but be controlled by management would improve but still would remain below potential.

Alternative 4 – Modified Proposed Action

Under this alternative all areas on the Bald Hill Allotment currently exhibiting riparian potential would be fenced and a winter grazing only pasture in Copper Canyon Allotment would be used. This would allow all riparian areas potentially impacted by livestock grazing to develop to potential.

Alternative 5 – Reduced Utilization

This alternative is the same as Alternative 4 in regards to this issue since the proposed riparian fencing and winter grazing are the same for both alternatives.

ISSUE 3 – Controlling water access on Squaw Peak Allotment**Alternative 1 – No Action**

Under this alternative there is no livestock grazing so the issue is moot.

Alternative 2 – Current Management

Under this alternative current management would continue to be unable to fully control distribution of use and overuse in some areas would continue.

Alternative 3 – Proposed Action

Under this alternative livestock use of water through control of water flow would be used in conjunction with herding. While this would be expected to achieve desired distribution and deferment, herding would need to be diligently managed.

Alternative 4 – Modified Proposed Action

Under this alternative waterlots are proposed to be constructed around water sources. This would alleviate the uncertainties associated with herding alone and would ensure livestock movement and deferment of areas.

Alternative 5 – Reduced Utilization

This alternative utilizes the same strategies as Alternative 4, producing the same effects.

Additional information associated with these issues is contained in the following section.

AFFECTED ENVIRONMENT and EFFECTS RELATIVE TO KEY RESOURCES

Effects of the alternatives are discussed in this section for the following resource areas:

- Soils, Vegetation, and Riparian Resources
- Watershed Condition
- Wildlife and Rare Plants
- Air Resources
- Wilderness Resources
- Verde Wild and Scenic River
- Heritage Resources

This section also includes other findings concerning public health and safety, prime farm lands, range structures, economics, and environmental justice.

No changes are proposed to any roads within the project area and no new roads are proposed under any of the alternatives. Therefore, a roads analysis was not needed.

The effects of grazing were determined by analysis of existing ecological condition plot data collected for the Terrestrial Ecosystem Survey (TES) and for the Ecological Classification of the Prescott National Forest, field data collected during range inspections which also identified livestock utilization patterns, evaluated soil quality indicators, channel and riparian condition (watershed condition) information on the allotments (PR#117). Water quality information from the Arizona Department of Environmental Quality was used to determine if water quality impairment was occurring in the watersheds where the allotments are located (PR#106).

SOILS, VEGETATION AND RIPARIAN RESOURCES

There are four unique vegetative formations in the project area (PR#s104, 114, 117); the effects analysis is organized by these formations:

- pinyon/juniper
- desert shrub/grassland
- chaparral
- riparian

Within each vegetative formation there are factors (such as soil parent material, soil depth, climatic regime, slope, and plant community) that have been identified as creating a unique Terrestrial Ecosystem Survey map unit. The TES map units are the foundation blocks of the environmental effects analysis. Data on each map unit was examined to determine the effects of livestock grazing on plants and soils. Most map units occur in multiple locations in the analysis area and each unique occurrence is called a polygon (Appendix 5).

Drought is currently affecting vegetation and available water. Vegetation responses to dry weather include die off of short lived perennial grasses and stress to other grasses as well as the loss of ponderosa and pinyon pine and, to a lesser extent, juniper. Within this analysis area there has been mortality to curly mesquite, aristedas, juniper and pinyon pine and other species exhibit stress or indications of mortality. Distribution of drought effects is not uniform but is more obvious on some TES map units (Existing Condition PR#117). While drought and weather cycles are factors that could reset the ecological baselines for resources, adaptive management can respond to short term fluctuations in resource conditions. Re-analysis may be needed if conditions change significantly from those predicted in this analysis.

Pinyon/Juniper Woodlands

The pinyon/juniper woodlands are the largest vegetative formation of the analysis area covering 27,145 acres (77% of total project area). This formation has a large variation in tree/shrub canopy cover, often within the same map unit.

Affected Environment

These woodlands occur throughout the analysis area. Through a combination of factors (including grazing, reduced fire, and climate) the community has expanded in range and individual stands have increased in woody canopy density. As a direct result of this expansion and increasing woody (tree/shrub) canopy density, the understory herbaceous species have, in turn, decreased in diversity and cover.

Approximately three quarters of the pinyon/juniper woodlands are on moderate slopes (15-40%) and half of these acres have higher shrub or tree cover than predicted at potential. Grass cover varies widely from similar to potential to up to two times less. Since improvement may be limited by tree and shrub canopy cover, changes in or removal of livestock management alone would not be sufficient to restore the species composition and diversity described by TES.

Slightly more than 15% of these woodlands are on gentle slopes (0 to 15%) with, generally, less grass cover and similar to slightly higher shrub and tree cover than predicted at potential. These areas are easily accessed by livestock and influenced by the effects of grazing management.

Slightly more than 10% of these woodlands are on relatively steep slopes (40 to 120%). These areas receive limited grazing. Inspections and plots found no measurable grazing related effects and the units are similar to TES potential.

Soils:

Soil conditions vary greatly and are predominantly associated with the variable juniper densities. Soils generally are shallow to deep, and have a slight to moderate erosion hazard rating. The soil

surface texture is predominantly fine with some coarse textured areas and primarily associated with basalt parent material with some limestone parent material (TES 460).

Several major map units (TES 432, 461, 464) have multiple soil condition ratings ranging from satisfactory to unsatisfactory. Loss of ground cover due to juniper canopy density and subsequent loss of fine soil particles is the most common reason for the unsatisfactory rating in these units. Soils with satisfactory ratings generally have lower juniper densities and thus higher vegetative ground cover (VGC) that maintains soil function.

Vegetation:

Tree canopy density affects understory vegetation for individual locations of TES map units having pinyon/juniper vegetation. As the density of pinyon and juniper trees increases, the understory species decrease in diversity and cover (West and VanPelt, 1986, Tress and Klopatek, 1986). The point at which the canopy dominates vegetation varies between map units but the Draft Ecological Classification (Girard, M. and W. Robbie 2003) documents canopy density at between 25% and 40% for most map units to be that point.

Two map units, TES 427 (0-15% slopes) and TES 432 (10-35% slope) show the most impacts from livestock use. These are the areas where changing livestock management can be most effective at changing resource conditions. Most of TES 461 is limited by woody cover but livestock use has caused localized impacts on sites with lower woody cover. Other map units contain limited areas of concentrated grazing, usually near water, but overall the effects of grazing are not limiting vegetative ground cover, though they may be affecting grass species diversity. Although livestock are seen in map units of 50% and greater slope, these areas receive only incidental use and few measurable grazing effects were found in inspections or on plots. Therefore these areas are not further discussed.

Direct and Indirect Effects

Alternative 1: Removal of livestock would improve vegetative ground cover, grass diversity, and soil condition on all map units where grazing is a limitation. This includes most of 2,600 acres (TES 427, 432) and portions of 13,914 acres (TES 460, 461, 462, 464). The increase of vegetation ground cover and lack of compaction from livestock grazing would improve soil conditions.

Alternative 2: Current grazing management would continue to result in lower vegetative ground cover and limited grass diversity on approximately 1604 acres of TES 427 and 432 and in limited areas of TES 461. Soil conditions would remain degraded in these areas.

On the majority of TES 460, 462, and 464 high juniper cover would continue to limit vegetative ground cover production and soil degradation would continue. Livestock grazing has minimal to no impact on these sites.

Alternative 3: Reduction of juniper canopy on 2,560 acres on Bald Hill Allotment, 1,061 acres on Squaw Peak Allotment, and 147 acres on Copper Canyon Allotment (there were no identified needs on the Young Allotment) would occur. Acres treated vary in tree canopy density but all lack grass cover and litter between trees. Many of these acres are currently in unsatisfactory soil

condition because of canopy cover and would improve with canopy reduction. However, the improvement in ground cover would be lessened because there would be a minimal decrease in grazing intensity and in some cases no change in livestock management.

Alternative 4: Bald Hill – Expected improvement in vegetative ground cover, grass diversity and soil condition on 1604 acres of TES 427 and 432 in Bates/Bull pastures due to lower allowable use. On TES 461, 462, and 464 there would be a small improvement to vegetation ground cover, grass diversity and soil conditions. However, these sites would continue to be limited by the high juniper cover resulting in continued reduction in soil function. Livestock grazing has minimal impact on these sites.

Copper Canyon – No change from Alternative 2 because there is no juniper density reduction proposed.

Squaw Peak – Expected improvement in vegetative ground cover, grass diversity, and soil condition on 183 acres of TES 427 and in localized areas of TES 461 because the grazing intensity would decrease. On TES 460, 461, 462 and other TES units where juniper canopy is dense, there would be a slight improvement to vegetation ground cover, grass diversity, and soil conditions because of the lower grazing intensity. However, degradation would continue because of the high juniper cover. Livestock grazing has minimal to no impact on these sites.

Young – No change from Alternative 2 since the proposed management strategy remains the same as in Alternative 2.

Alternative 5: Bald Hill – Vegetative ground cover, grass diversity and soil conditions would improve on all 2,604 acres of TES 427 and 432 because of lower grazing intensity. The improvement in Bates/Bull pastures would be less than Alternative 1 because grazing would continue.

On TES 461, 462, and 464 there would be a slight improvement to vegetation ground cover, grass diversity and soil conditions because of the lower grazing intensity. These sites would continue to be limited by the high juniper cover and degradation would continue. Livestock grazing has minimal to no impact on these sites.

Copper Canyon – There would be a slight improvement to vegetation ground cover, grass diversity and soil conditions because of the lower grazing intensity. These sites would continue to be limited by the high juniper cover and degradation would continue. Livestock grazing has minimal to no impact on these sites.

Squaw Peak – Same as Alternative 4 and therefore would have the same effects as that alternative.

Young – Reduced utilization would result in no measurable difference between Alternatives 2, 3, or 4 since short duration grazing remains the management strategy.

Desert Shrub/Desert Grassland

This vegetative formation covers 4,451 acres (12% of total project area) in the Verde Valley on the Copper Canyon, Squaw Peak and Young Allotments. These are areas of livestock concentration and higher available forage, and are given particular attention in this analysis.

Affected Environment

Soils:

This ecosystem has gentle to moderately steep slopes with deep soils and has a slight to severe erosion hazard rating. The soils are formed from alluvium limestone parent material and are slightly to moderately alkaline with a medium to coarse surface texture.

Soil conditions vary from impaired to unsatisfactory. Degradation is primarily due to inherent ecosystem characteristics such as calcareous or saline soils and erosive alluvial soils, although livestock use has caused some compaction in localized areas.

Vegetation:

This formation was accessible from the Verde River and proximate to a market for cattle and was subject to high intensity livestock grazing beginning in the 1860's. Existing vegetation data indicates that shrub cover is higher and grass cover lower on many areas when compared to TES predicted. The shrub component appears to have reached a point where shrubs will continue to dominate these sites, and grasses will stabilize at amounts much lower than potential or may continue to decline. These sites appear to have lost the ability to reach their predicted potential without treatments to reduce/eliminate shrub species. Improved livestock management may result in increases in herbaceous plant material but livestock management alone will not be sufficient to restore species composition and diversity to that described by TES.

Effects of historic grazing are probably responsible for the shift in equilibrium that allowed shrubs to become the dominant growth form on most of this formation. Those effects include reduced vigor and increased mortality to grasses, less fine fuel to carry fires, and reduced ground cover to retain soil moisture.

Three TES map units make up this formation:

TES 368. Shrub cover is 466% of predicted (predicted 9%, present 34.5%) and grass cover is only 37% of predicted (38% potential, 14% present). Two polygons show current impacts from grazing and one of those polygons has extensive recreational use impacts.

TES 382. Shrub cover is 150% of predicted (23% predicted, 35 % present). Grass cover is only 38% of predicted (34.5 % predicted, 13% present). The difference in shrub cover is not uniformly limiting as on some plots the dominant shrub was snakeweed which does not limit grass but does indicate disturbance from grazing. Shrub cover does limit about 650 acres and another 250 acres is losing grass to shrub cover. The remainder of the map unit has the greatest potential change with improved management.

TES 383. Shrub cover is 158% greater than predicted (21.5% predicted, 34% present). Grass cover is only 80.9% of predicted (21% predicted, 17% present). The main difference in grass cover is the lack of New Mexico needlegrass which is projected to be present at 6-8%. This species was not found in plots or inspections and is a weak perennial so the difference in cover may not be meaningful. Shrub canopy limits ground cover creating soil instability in some areas. Grazing effects on TES 383 are localized near water and this unit is expected to change least by alternative.

Direct and Indirect Effects

Alternative 1: Improvement in vegetative ground cover, grass diversity, and soil condition is expected on the following TES map units:

- TES 368: An estimated 136 acres in Lucky pasture and another 50 acres near water in Copper Canyon pasture would improve with no grazing.
- TES 382: 850 acres on Squaw Peak, Copper Canyon, and Young Allotments.
- TES 383: 133 acres near Cottonwood Spring (Copper Canyon Allotment).

Overall, across the formation, there would be an improvement due to a decrease in compaction and increased herbaceous ground cover, especially on TES 382. However, a continued decline would be expected on approximately 550 acres of map units TES 382 and 383 in Copper Canyon Allotment because of increasing mesquite, prickly pear and other woody plant cover. Conditions are also expected to continue to degrade on TES 368 because of its inherent soil characteristics (PR#114).

Alternative 2: Vegetative ground cover, grass diversity, and soil condition is expected to remain low and remain degraded on approximately 1169 acres currently affected by livestock grazing, and continue to degrade on another 550 acres because of increasing woody cover.

Alternative 3: Squaw Peak – Stocking would be reduced by 1/3 and the area grazed would be reduced, but because utilization does not change, those areas that are grazed would remain similar to existing condition. This is an improvement over Alternative 2. Reduced stocking is expected to increase vegetative ground cover, grass diversity, and soil condition as a result of reduced grazing distribution and the possibility that deferment of grazing could be accomplished with available water.

Copper Canyon – An estimated 550 acres would improve in the Copper Canyon and Lucky Pastures because the prescribed fire would reduce the mesquite and prickly pear cactus density and improve vegetative ground cover, grass diversity, and soil conditions. However, improvement would be limited because current livestock management would not change. The remainder of the grassland conditions would remain the same as Alternative 2.

Young – No difference from Alternative 2 as there would be no change in management strategy.

Alternative 4: Reduced allowable use on the Squaw Peak Allotment and the Cottonwood pasture of Copper Canyon Allotment addresses the majority of map unit 382 most affected by

grazing. Reducing grazing intensity would improve vegetative ground cover, grass diversity, and soil conditions.

On the Copper Canyon Allotment, prescription for fire does not change between Alternatives 3 and 4. However, reduced grazing intensity in burned areas is expected to result in improved resource conditions over Alternative 3.

Young – No difference from Alternative 2 because there is no change in management strategy.

Alternative 5: Reduced allowable use/utilization lessens the grazing intensity on the areas in all map units and allotments affected by grazing. This would improve vegetative ground cover, grass diversity, and soil conditions over Alternative 4. Effects on Squaw Peak, containing most of the areas impacted by livestock grazing, are the same as Alternative 4 because livestock management would not change.

On the Copper Canyon Allotment, prescription for fire does not change between Alternatives 3, 4, and 5. However, reduced grazing intensity in burned areas is expected to result in improved resource conditions over Alternative 3 and 4.

On the Young Allotment reduced utilization would result in no measurable difference between Alternatives 2, 3, or 4 since short duration grazing remains the management strategy.

Chaparral

Three map units make up the 3, 842 acres (10% of project area) in the chaparral vegetative formation. Two of the map units are in the 40 -120% slope class. Stands differ in parent material and slope, but the vegetative composition of this community, generally, includes higher tree, lower shrub, and higher grass cover than described at potential.

Although fire occurrence is normally common in this community type, the chaparral in this analysis area does not have documented fire occurrence. This is possibly due to being located near developed areas in the Verde Valley or being located on moist east and north slopes.

Affected Environment

Soils:

This ecosystem is found on gentle to very steep slopes with a shallow to deep soil depth and has a slight to severe erosion hazard rating. The soil surface texture is medium to coarse texture and is well armored with a high surface rock cover.

The majority of this ecosystem has satisfactory soil conditions and shows no adverse impacts from livestock grazing. However, some soil degradation is occurring within this ecosystem because of inherent soil characteristics, high shrub cover, and, in some cases, livestock grazing.

Vegetation:

TES 551 receives grazing in the Box T Pasture on Copper Canyon Allotment. Grazing is concentrated in flatter areas or near the #511 motorized recreation trail but cattle can also be seen moving across steep slopes to preferred grazing.

TES 469 is 0-15% slope at lower elevations and is typically grazed.

Plots on TES 551 found more tree and grass cover and less shrub cover than TES predicts. Grass species diversity is greater than TES predicted. Inspections documented similar conditions. Soils are stable and little bare ground occurs. Light use limits grazing impacts.

The 172 acres of TES 469 on Copper Canyon is shrub dominated with no grass. On Squaw Peak TES 469 receives varying amounts of grazing. Much of the unit is grazed with acceptable effects but approximately ½ of the 670 acre southern polygon is grazing impacted and has less grass and litter than predicted.

Direct and Indirect Effects:

Alternative 1: Vegetation ground cover, grass diversity, and soil conditions would show the greatest rate and extent of improvement than any alternative because there would be no impacts from livestock grazing. Recovery of the southern polygon on the Squaw Peak Allotment would be fastest with no grazing and the low potential grass cover (9%) would be easiest to maintain without grazing.

Alternative 2: Vegetative ground cover, grass diversity, and soil conditions would remain the same because of current livestock management.

Alternative 3: This alternative would slightly reduce grazing intensity on Squaw Peak but would retain the current utilization. Vegetative ground cover, grass diversity, and soil conditions would improve slightly but, because there is water in the chaparral, localized areas would remain degraded. Areas that have negligible to no impacts from livestock grazing effects would have little to no change.

Alternative 4: This alternative would reduce grazing intensity on Squaw Peak by lowering utilization to 25% with no seasonal variation. Lower stocking would reduce grazing intensity and allow some level of grazing deferment by controlling livestock access to water. Vegetative ground cover, grass diversity, and soil conditions would improve and localized degraded areas would stabilize. Areas that have negligible to no impacts from livestock grazing effects would have little to no change.

Alternative 5: Reduced utilization would result in no measurable difference between this alternative and Alternative 4 since the grazing prescription applied to this ecosystem is the same for both alternatives.

Riparian Resources

Riparian areas occupy 248 acres throughout the project or only 1% of the project area. Two types of areas fall into a TES classification in this formation but only one of them supports riparian vegetation. TES 034 includes rarely flooded alluviums containing ephemeral channels with a large bedload and a xeric vegetation component but no riparian plant species. TES 041 has varying amounts of water and riparian vegetation potential. Information on specific riparian sites is found in the watershed condition/water quality section.

Soils and Vegetation Cumulative Effects

Soils and Vegetation:

Watershed condition is the basis used to evaluate the cumulative effects of soil and vegetation condition. Soil and vegetation resources and the management activities that impact these resources occurring within the cumulative effects analysis area are included as part of the watershed condition discussion.

WATERSHED CONDITION

The vegetation communities discussed above are spread across the analysis area within three 5th-level watersheds; Ash Creek-Sycamore Creek, Cherry Creek-Upper Verde River, and Fossil Creek – Lower Verde River (PR#106).

The Ash Creek-Sycamore Creek watershed drains into the Agua Fria River. The other two watersheds drain into the Verde River (PR# 106).

Watershed Condition incorporates the inherent sensitivity of the watershed and the amount the watershed has been impacted. These two concerns are broad scale and incorporate the upslope conditions. Since channel and riparian areas are less extensive, add important habitat diversity and provide for the transport of necessary water, nutrients and woody materials, the condition of riparian areas and channel functions are discussed specifically.

Affected Environment

Ash Creek-Sycamore Creek

The entire 5th-level Ash Creek/ Sycamore Creek watershed was chosen as an analysis area. In this watershed water quality standards are attaining beneficial use and are not being negatively impacted by soil conditions. Current conditions show a general upward trend. However there are riparian areas that are being negatively impacted by cattle.

This watershed contains the greatest portion of the Bald Hill Allotment, as well as small portions of the Copper Canyon and Squaw Peak Allotments. There are no streams in the Copper Canyon Allotment portion, and only a ½-mile of Horner Gulch (no riparian vegetation potential), and part of Arnold Canyon in the Squaw Peak Allotment portion.

The main drainages of the watershed associated with the project are Arnold Canyon and Cienega Creek, both of which drain into Ash Creek. There are also two large developed springs, Joe Best and Reimer.

Arnold Canyon has surface flow from the banks and from a hand dug well at the Arnold Place homestead. This flow occurs for about 1 mile below the Arnold Place in the Arnold and Bald Hill Pastures. The Proper Functioning Condition (PFC) rating (USDI – Bureau of Land Management 1998) in the Arnold Pasture is *Functional*. In this section the channel is naturally constricted with step-pool formation and stable well-vegetated banks. Riparian vegetation is healthy and diverse.

In Bald Hill Pasture, just downstream, the channel has become wider and shallower. Although the stream is in a canyon and access is limited the area is grazed and is below vegetative potential. The PFC rating is *At Risk* because riparian vegetation has been impacted by grazing and does not have the necessary diversity in either composition or age class for a healthy system.

Cienega Creek has some inflow from springs but most of the creek is dry. Riparian species may produce seedlings but they do not survive. This suggests that the water submerges below the rooting zone and is no longer available to support this type of community. However, there is intermittent water associated with geologic features that move water to the surface and allow riparian vegetation to develop. There are two areas where this occurs one has an existing exclosure. The other is located at the boundary between the Forest and private lands and has no exclosure. Here, cattle have impacted the riparian vegetation and have caused bank damage. The PFC rating for the Creek as whole is *functional*.

Joe Best Spring, on an upper fork of Cienega Creek, has an exclosure. The channel within this exclosure has reestablished a thalweg (thread of flow) and riparian vegetation is healthy and expanding. About ¼ mile above the exclosure, there has been an increase in channel function where check dams have allowed cottonwoods to become established. The PFC rating is *functional* due to the expanding healthy conditions.

Reimer Spring flows from an exclosure in Reimer Draw on the Cienega Allotment to the Bald Hill Allotment where it is accessed by cattle in a water lane. The PFC rating is *functional* due to the overall channel hydrology although cattle graze the riparian vegetation heavily within the water lane.

Cherry Creek/ Upper Verde River

This watershed incorporates land on both sides of the Verde River and involves less than 2% of the project area. For these reasons, and to concentrate rather than dilute the potential effects of the project, the analysis area is Gaddis Canyon and the area between it and the southern watershed boundary, rather than the entire Cherry Creek/ Upper Verde 5th code watershed.

Gaddis Canyon Analysis Area

This watershed drains into the Verde River. This reach of the Verde River was listed as being impaired due to turbidity levels by Arizona Department of Environmental Quality (ADEQ). A turbidity Total Maximum Daily Load (TMDL) was approved by the Environmental Protection Agency (EPA) in 2002, but this section remains listed as *not attaining* for Aquatic and Wildlife:

Warm Water Aquatic Community until monitoring indicates that designated uses are being attained.

Gaddis Canyon includes about ¼ of the Copper Canyon Allotment and only a minute portion of the Bald Hill Allotment. There is neither perennial nor intermittent flow in this analysis area. A section of ephemeral channel was assessed as having a PFC rating of *At Risk* due to sediment entering from adjacent steep upland areas but cattle were not affecting this condition.

In the general area gullies are stable, with vegetation growing in the bottoms, the soil surface allows good water infiltration and there is good channel hydrologic function.

Fossil Creek-Lower Verde River

This watershed incorporates land on both sides of the Verde River and encompasses most of both the Copper Canyon and the Squaw Peak Allotments, as well as a portion of the Bald Hill Allotment. Because the watershed incorporates land on both sides of the Verde River, it has been divided into three smaller analysis areas to allow a more focused look at the potential effects of the project. These analysis areas are not all true watersheds, but are designed to facilitate answering water quality concerns.

No Name Analysis Area

The northern analysis area begins at the northern watershed boundary of the Fossil Creek/ Lower Verde 5th code watershed and extends south nearly to West Clear Creek. This area includes the drainages of Copper, Lucky, and Ryal Canyons and drains into the Verde River.

Copper Canyon drainage has intermittent water that moves a short distance through the Bull Pasture (Bald Hill Allotment) then through the Tompkins Pasture and the upper part of the Copper Canyon Pasture (Copper Canyon Allotment).

The Bull Pasture section of the drainage is not accessible to livestock and receives no livestock use. This section has a PFC rating of *functional*.

The Tompkins Pasture section of the drainage has varying amounts of riparian woody plants indicating potential. Winter grazing pressure is light because the canyon is a cold air sink and livestock graze the slopes above the drainage in cool weather. In warm weather the riparian vegetation is grazed heavily. The PFC rating for this area is *At Risk* because the riparian vegetation does not reflect potential due to grazing pressure.

Copper Canyon Pasture section has sycamore trees and seep willow growing in the channel. Large rocks inhibit livestock access and it shows little evidence of grazing upstream of the homestead where riparian vegetation is found. This segment had been disrupted by freeway runoff, and then stabilized with jersey barriers. The PFC assessment is rated *Functional* with diverse and healthy riparian vegetation.

Ryal Canyon is a steep walled drainage with intermittent flows originating from Ryal and Cottonwood Springs before going dry. Livestock obtain water near a recreation trail bridge but do not tend to graze within the drainage. The condition is rated as *At Risk, with an upward trend*.

Lucky Canyon has perennial pools and was rated as being *Functional*.

Beasley Flats Analysis Area

The middle analysis area, Beasley Flats, incorporates several unnamed drainages that drain into the Verde River. The drainages have no surface flow or riparian vegetation. The current PFC rating is *At Risk*, due to the lack of water.

Chasm Creek Analysis Area

The southern analysis area is the true watershed of **Chasm Creek**. This watershed drains into the same segment of the Verde River as the Beasley Flats analysis area.

Chasm Creek has perennial pools and intermittent flow in the upper drainage but no livestock grazing occurs there. Downstream pools near the Squaw Peak Allotment boundary are used by cattle when there is water, but the steep gradient and bouldery bed of the channel limits riparian potential to the Sycamore trees that grow there and grazing is not a factor on development of vegetation. Livestock grazing is not a factor in development of the riparian vegetation. The PFC rating is *Functional*.

Direct and Indirect Effects

Water quality, the condition and functioning of hydrologic and soil properties, and the condition and functioning of channel and riparian areas can all be affected by management actions.

The difference between alternatives in potential effects is displayed in Table 3.1, and discussed below.

The impact index is a measure of management activities that have the potential to impact watershed condition, including water quality, and the condition and proper functioning of soils, channels and riparian areas. Impact index is a percentage of the watershed that has been impacted; that is, acres impacted by human activities divided by total analysis acres.

The impact index is one indicator which allows quantification of potential effects. There is an obvious change in the impact indices due primarily to removal of cattle (Alternative 1), the increase in areas excluded from grazing (riparian enclosure), or reduced allowable use/utilization (Alternatives 3 – 5). However, some of the change is the improvement resulting from adaptive management procedures.

TABLE 3.1 Comparison of Watershed Effects

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
	Watershed Condition				
Impact Index	0.5%	No change from project area impact index of 8.7%	Short-term increase due to prescribed fire, but overall reduction to 7.5%	Short-term increase due to prescribed fire, but overall reduction to 4.1%	Short-term increase due to prescribed fire, but overall reduction to 2.0%
Upslope condition	Slight improvement	no change	Greatest improvement due to juniper/ desert shrub treatment	Less improvement than Alternative 3; more than alternative 1 due to Rx fire	Less improvement than Alternative 3; more than alternative 1 due to Rx fire

Channel Function					
Profile and Dimensions	Gradual improvement	Gradual localized improvement	Less extent than Alternative 1; greater than Alternative 2	Less extent than Alternative 1; greater than Alternative 3	May cover a larger area and react more spontaneously than Alternative 4.
Sediment	Greatest extent of improvement.	Baseline, continuation of existing conditions	General improvement from Alternative 2, but potential of short term increase due to prescribed fire.	Same as Alternative 3 except that more riparian areas are enclosed, increasing bank and channel bottom protection, but lower overall extent than Alternative 1.	Same as Alternative 4
Riparian					
Vegetation (density and diversity)	Greatest extent of improvement.	Baseline, continuation of existing conditions	Slight improvement over Alternative 2; within exclosures.	Addresses more problem areas than Alternative 2, but affects a lesser extent than Alternative 1	May cover a larger area and react more spontaneously than Alternative 4.
Soils (function)	Greatest extent of improvement.	Baseline, continuation of existing condition	Very slight improvement over Alternative 2	Addresses more problem areas than Alternative 2, but affects a lesser extent than Alternative 1	May cover a larger area and react more spontaneously than Alternative 4.
Water Quality					
Stream impairment	No change	No change	No change	No change	No change

Alternative 1:

Watershed condition: Alternative 1 has no actions to improve soil conditions on a large scale. However, the removal of cattle would cause an overall improvement from reduced utilization of herbaceous material, especially along channels. However, this alternative contains neither juniper removal nor prescribed fire which would actively remove woody plants and encourage herbaceous cover.

Channel profile and dimension: There would be a gradual system-wide repairing of impacted channel dimensions brought about as sediment sources, both local and from upstream areas, are no longer activated, and vegetation stabilizes eroding banks and disturbed floodplains. This would lead to the development of floodplain and thalweg formation in segments that had been severely impacted, reestablishing proper form and function.

Riparian area condition: Areas with riparian potential that are affected by livestock grazing would gradually develop to potential.

Alternative 2:

Watershed condition: Alternative 2 has no actions to improve soil conditions on a large scale.

Channel profile and dimensions: Current conditions show a general upward trend, due to the use of adaptive management. Those riparian areas not currently protected by fencing would continue to degrade.

Riparian area condition: The Forest has responded to drought conditions by reducing livestock numbers and/ or changing season and duration of use. However, without the riparian exclosures and change of seasons proposed in Alternatives 3, 4 and 5, or the lack of grazing in Alternative 1, those riparian areas not currently protected by fencing would continue to degrade.

Alternative 3:

Watershed condition: Alternative 3 proposes fewer riparian exclosures than Alternatives 4 and 5. Alternative 3 proposes treatment of juniper and desert shrub canopy removal, leading to improved soil conditions on over 3,750 acres. Alternatives 3, 4 and 5 each propose approximately 550 acres of prescribed fire which would improve watershed condition by leading to an increase in herbaceous cover.

Channel profile and dimension: Alternative 3 increases riparian protection on Bald Hill at Reimer Spring and Cienega Creek by extending existing exclosures. Copper Canyon Allotment continues winter use of Tompkins pasture and provides for additional riparian fencing in the Copper Canyon drainage if needed. Upslope juniper removal treatments would increase herbaceous cover and reduce surface runoff and soil transport to the channel network.

Riparian area condition: Alternative 3 proposes fewer riparian exclosures than Alternatives 4 and 5, but more than Alternative 1.

Alternative 4:

Watershed conditions: Alternative 4 proposes more area within riparian exclosures than Alternatives 2 or 3, but provides less protection than Alternative 1. This alternative does not contain juniper removal treatments, but does propose prescribed fire treatments on approximately 550 acres. Generally, the overall effects on watershed condition are the same as Alternative 5, although they may not occur as quickly.

Channel profile and dimension: As in Alternative 3 the exclosures at Reimer Spring and in Cienega Creek would be extended on Bald Hill. In addition, new exclosures would be constructed in Arnold Canyon and in Cienega Creek at the Forest boundary with private land providing riparian protection in more areas than Alternative 3. Effects to Copper Canyon would be the same as Alternative 3. Sediment delivery would not be reduced by upslope juniper removal treatments.

Riparian area condition: More riparian areas would be protected from grazing and trampling than with Alternatives 2 and 3, although, at least initially, not as well as in Alternative 5.

Alternative 5:

Watershed conditions: The reduced utilization proposed in Alternative 5 would probably have greater positive impact on the vegetative resources than the Forest policy of adaptive management because grazing intensity would be reduced throughout the project and not just in areas of concern. Generally, the overall effects on watershed condition are the same as Alternative 4 because other management practices (e.g. riparian are fencing, prescribed burning, winter only pasture use, grazing duration) remain the same as Alternative 4.

Channel profile and dimensions: Channel changes may occur more quickly than in Alternatives 2, 3, and 4 due to vegetative response in riparian areas.

Riparian area condition: The reduced utilization proposed in Alternative 5 would initially have greater positive impact on the vegetative resources than the Forest policy of adaptive management. At least initially, effects would be more noticeable than Alternative 4.

Cumulative Effects

Cumulative effects analysis considers other activities within the larger analysis area that may cause the same type of disturbance as those proposed by the project, in this case, cattle grazing. Such activities are those that may increase sediment delivery to the drainage network, impact channel profile, reduce riparian area functioning, or destabilize slopes. Such activities include roads, urban development, recreation use, fire/brush crushing, gold-panning, other mining operations, or cattle grazing in areas outside of the project area boundaries.

Watersheds have a certain resiliency to management activities that is based on a number of factors such as soil ability to infiltrate water, channel stability and functioning to transport nutrients and water, and riparian area existence and functioning as a sponge to help control peak flows.

The Natural Sensitivity Index (NSI) is the percentage of the analysis area that consists of sensitive resource acres (riparian community existence, severe soil erosion hazard, potential for soil compaction, gullyng, soils rated as being in unsatisfactory or impaired condition, and calcareous conditions on gentle slopes) that is acres of sensitive acres divided by total analysis area acres. The Natural Sensitivity Indices of the watersheds in the project area is high (PR#106).

TABLE 3.2 Summary Table for Cumulative Effects within Analysis Areas

Watershed	Sensitivity Index	Impact Index	Proposed Fire/ brush crush	
			Acres	%
Ash Creek-Sycamore Creek Watershed	86.7	10.4	4,289	2.5%
Gaddis Canyon Analysis Area	87.4	25.5	0	0.0%

Fossil Creek / Lower Verde Watershed: No Name analysis area	98.5	20.5	550	3.4%
Fossil Creek / Lower Verde Watershed: Beasley Flats analysis area	81.8	19.1	0	0.0%
Fossil Creek / Lower Verde Watershed: Chasm Creek Analysis Area	99.0	0.5	0	0.0%
Average	90.6	11.5		

Ash Creek/ Sycamore Creek Watershed

There are scattered parcels of in holdings within this watershed concentrated in the southeastern portion generally on sensitive soils and land development is increasing. However, the greatest impacts from urbanization (compaction and creation of impermeable surfaces, increase of drainage network and flow quantities and power) are not being duplicated by cattle, at least in the project area and thus this project is not contributing to cumulative effects from these other activities.

Some portions of 18 grazing allotments are in this watershed. While cattle have caused negative impacts in portions of this watershed in the past, none of the alternatives propose actions that will increase these impacts on this watershed, and most of the alternatives include actions (such as an enclosure on Cienega Creek and change of season below the Arnold place) that may locally improve it. Thus this project would not contribute to cumulative effects from the other allotments.

There are approximately 271 miles of roads, and 27 mines of various statuses. There is only minor off-road recreation. Roads, mining, and off-road recreation are causing only minimal impacts, and the greatest impacts, such as increasing the entrance of water and sediment to the drainage network during storm events, are not duplicated by cattle. Therefore, this project would not contribute to cumulative effects from these other activities.

Approximately 2,035 acres in the juniper-pinyon ecotype have been treated to reduce juniper densities in the past. An additional 2560 acres are proposed under Alternative 3. Most of these acres are located on soils rated as being in unsatisfactory or impaired condition. Reducing overstory would lead to improved herbaceous cover and soil functioning on these acres. Cumulatively Alternative 3 would contribute incrementally to an improved vegetative mosaic, reduced soil impairment, and improved watershed condition through the improved hydrologic function of the total treated acres.

In the recent past, approximately 9,900 acres were burned during the Cherry prescribed fire. Currently the Mingus fuels reduction project proposes burning approximately 4,289 acres and an active prescribed fire program has been pursued in the grassland areas of this watershed. Since

1981 over 100,000 acres have been burned, some locations more than once. While the result has been decreased sediment transport due to the increase in herbaceous cover, there are no prescribed fires planned in this watershed under this project nor does cattle grazing duplicate fire effects. Thus there would be no contribution to cumulative effects from this project.

Water quality has not been an issue in this watershed (ADEQ 2004; PR#106). Proposed project actions would not increase danger to water quality because of the large size of the watersheds in relation to the project area. Thus there would be no contribution to cumulative effects from this project.

Cherry Creek/ Upper Verde Watershed – Gaddis Canyon Analysis Area

There are scattered parcels of private inholdings within this watershed, concentrated in the southeastern portion and generally on sensitive soils, and land development is increasing. However, the greatest impacts from urbanization, compaction and creation of impermeable surfaces, increase of drainage network and flow quantities and power, are not being duplicated by cattle, at least in the project area. Thus, there would be not contribution to cumulative effects from this project.

Cattle are not known to be the cause of any malfunctioning riparian area or channel conditions within this watershed. There are no cumulative actions presently occurring, or known of in the future, that would cause or increase project negative impacts on channel, riparian or watershed condition.

There are approximately 16 miles of roads, and one active mine. There is no known off-road recreation. Roads and mining are causing only minimal impacts, and the greatest impacts, such as increasing the entrance of water and sediment to the drainage network during storm events, are not duplicated by cattle. Thus, there would no contribution to cumulative effects from this project.

Water quality has been an issue in this watershed (ADEQ 2004; PR#106). Proposed project actions will not increase danger to water quality because of the large size of the watersheds in relation to the project area. Thus there would be no contribution to cumulative effects from this project.

Fossil Creek/ Lower Verde Watershed – No Name Analysis Area

There are parcels of private inholdings within this watershed concentrated in the southeastern portion generally on sensitive soils and land development is increasing. However, the greatest impacts from urbanization, compaction and creation of impermeable surfaces, increase of drainage network and flow quantities and power, are not being duplicated by cattle, at least in the project area. Thus, there would be no contribution to cumulative effects from this project.

While cattle have caused negative impacts in portions of this watershed, none of the alternatives propose actions that would increase negative impacts on this watershed, and most of the alternatives include actions (such as a change of season in the Tompkins Pasture) that may locally improve it. Thus, there would be no cumulative effects associated with this project from cattle grazing.

There are approximately 34 miles of roads, two historical mines, and four mines in planning status. There is only minor off-road recreation and no additional allotments in this analysis area. Roads, mining, and off-road recreation are causing only minimal impacts, and the greatest impacts, such as increasing the entrance of water and sediment to the drainage network during storm events, are not duplicated by cattle. Thus, there would be no contribution to cumulative effects from this project.

A prescribed fire project of approximately 900 acres is part of Alternative 3 and 550 acres in Alternatives 4 and 5. This fire is planned to improve soil and watershed health by increasing vegetative diversity, litter production and soil structure. While this will help watershed health effects of fire are not additive since there have been no other prescribed fires in this “watershed” and effects are not duplicated by cattle grazing. Thus, there would be no contribution to cumulative effects from this project.

Water quality in the Verde River segment bordering this “watershed” is an issue of concern (ADEQ 2004; PR#106). While land managed by the Prescott National Forest transports water, sediment and nutrients downstream, channels pass through irrigated and developed lands before reaching the Verde River. Leaking septic tanks are the largest likely source of *E.Coli* and any contribution from Forest lands due to cattle grazing is negligible. Thus, this project could incrementally contribute to cumulative effects, but the amount of the contribution would not be measurable, as compared to other actions.

Fossil Creek/ Lower Verde Watershed – Beasley Flat Analysis Area

There are parcels of private inholdings within this watershed concentrated in the southeastern portion and generally on sensitive soils, and land development is increasing. However, the greatest impacts from urbanization, compaction and creation of impermeable surfaces, increase of drainage network and flow quantities and power, are not being duplicated by cattle, at least in the project area. Thus, there would be no contribution to cumulative effects from this project.

While cattle have caused negative impacts in portions of this “watershed” in the past, none of the alternatives propose actions that would increase these impacts, and most of the alternatives include actions (controlling access to water and reducing utilization) that may locally improve it. Thus, there would be no contribution to cumulative effects from this project.

There are approximately 15 miles of roads, and six mines of various status. There is only minor off-road recreation and no additional allotments in this analysis area. Roads, mining, and off-road recreation are causing only minimal impacts, and the greatest impacts, such as increasing the entrance of water and sediment to the drainage network during storm events, are not duplicated by cattle. Thus, there would be no contribution to cumulative effects from this project.

Fossil Creek/ Lower Verde Watershed – Chasm Creek Analysis Area

While cattle in the adjacent non-project allotment (Brown Springs) are causing negative riparian area or channel conditions along the Verde River, the problems have been addressed in the recently completed Verde River Wild and Scenic River Plan (USDA Forest Service 2004). Since this “watershed” primarily consists of the Cedar Bench wilderness, grazing is light and impacts are minimal. Thus, there would be a minimal contribution to cumulative effects from this project.

There are approximately 6 miles of roads, and no known mines. There is only minor off-road recreation. These activities are causing only minimal impacts, and the greatest impacts, such as increasing the entrance of water and sediment to the drainage network during storm events, are not duplicated by cattle. Thus, there would be no contribution to cumulative effects from this project.

Conclusion:

The watersheds tributary to the Verde River appear to be moving towards equilibrium with sediment deposition, after a period of incision in the late 19th and early 20th centuries (USDA Forest Service 2001). In response to environmental conditions (such as drought) permitted numbers for cattle are currently at their lowest level in Forest history. This project would not contribute to cumulative adverse effect on riparian, channel or watershed condition and the alternatives contain proposals that will increase the function of specific important sites (riparian areas). There may continue to be adverse direct impacts, but these are most likely to occur where there is water or salt, and as riparian enclosures are extended, would decrease.

WILDLIFE and RARE PLANTS

The WSR (Wildlife Specialist Report, PR # 131) contains detailed analyses for all federally listed species, federally proposed species, Region 3 Regional Forester's Sensitive Species, PNF (Prescott National Forest) MIS (Management indicator species), appropriate migratory birds (includes PIF [Partners In Flight] priority species), and AGFD (Arizona Game and Fish Department) Wildlife of Special Concern. Appendix 2 contains the list of the above species for which no effects were identified because the species is not present in the project area and habitat is not present or would not be affected by project activities (PR#131). Species impacted by this project are discussed below. The effects of the alternatives are considered to include all actions associated with the project including livestock grazing, livestock moving and herding, maintenance and construction of fences, stock tanks, and drinkers, prescribed fire, and juniper treatments.

Razorback Sucker (Endangered), Colorado Pikeminnow (Experimental non-essential), Roundtail Chub (Sensitive)

There is no occupied, suitable or potential habitat in the project area for razorback sucker, Colorado pikeminnow, or roundtail chub. The Squaw Peak Allotment abuts the Verde River, which is occupied habitat, but is fenced to exclude livestock access to the river. Razorback sucker and Colorado pikeminnow occur in the Verde River as a result of ongoing reintroductions (1981 to present) of hatchery-reared fish stocked into the river. Long-term survival or recruitment from these fish reintroductions has never been documented (Hyatt 2004). Causal factors are thought to be high predation by non-native fish species and poor conditioning of hatchery-reared fish. The population status of roundtail chub in the Verde River is classified as Unstable-Threatened mainly because of suspected high predation and/or competition from non-native fish species (Voeltz 2002).

Direct and Indirect Effects

All Alternatives: There are no direct effects to the species because they are not present in the project area and livestock are excluded from accessing the Verde River. Watershed analysis of the 5th code watersheds in the Forest conclude that activities in the uplands, including livestock

grazing, are not having a discernable effect on the river at this time (USDA Forest Service 2001, Rocky Mt Research Station 2001). These alternatives would not have any measurable indirect effects to water quality and would not change existing aquatic habitat conditions or alter fish community composition and population trends and therefore would not have any measurable effects to TE&S fish populations in the Verde River.

Cumulative Effects

The cumulative effects area for the TE&S fish includes those portions of the Cherry Creek and Fossil Creek – Verde River 5th code watersheds affected by the project area.

All Alternatives: The following actions have been determined to potentially affect TE&S fish and their aquatic habitats in the Verde River:

* The majority of land adjacent the Verde River in the Camp Verde area is in private ownership. Population growth and housing developments have increased in the area. Land development in the watersheds may result in increases in runoff and flow of sediments to the river because of ground disturbing actions and conversion to impermeable surfaces. A turbidity TMDL for the Verde River is in place and will address turbidity loading from all potential sources through implementation of BMPs (ADEQ 2001). These actions would help to maintain and improve water quality which is a beneficial effect to TE&S fish.

* Livestock grazing occurs on other National Forest Service system (NFS) lands in the watersheds. Management actions such as livestock grazing exclusion from occupied and critical habitat have been taken to reduce effects to T&E fish species. In addition, BMPs are implemented throughout the watershed on NFS lands to improve watershed, soil, and riparian conditions and maintain water quality on the forests. These actions would help to maintain and improve water quality and aquatic habitat conditions which is a beneficial effect to TE&S fish.

* The Brown Springs Allotment will be fenced to exclude livestock grazing along 12-miles of the Verde River just downstream of the project area. Livestock grazing impacts to water quality would be eliminated because of reduced impacts to alterable streambanks that could result in excess sedimentation affecting macroinvertebrates (food supply). This action would help to maintain and improve water quality and aquatic habitat conditions which are a beneficial effect to TE&S fish.

* A portion of the Verde River Wild and Scenic River (VWSR) occurs in the Fossil Creek – lower Verde River 5th code watershed from Beasley Flat downstream to the confluence with Fossil Creek. The VWSR Management Plan (USDA Forest Service 2004) includes direction to maintain “Outstanding Remarkable Values” for native fish species and their habitats along the 40-miles of designated river. Under the management plan livestock grazing along the river corridor will not be authorized, vehicle access within the VWSR corridor will be reduced by closing numerous roads, and human waste and campfire ash will be removed by overnight boaters. These actions would have beneficial effects to TE&S fish because of reduced effects to water quality.

With no direct or measurable indirect effects to these species, there would be no contribution from this project to cumulative effects of the above activities.

Razorback Sucker - designated Critical Habitat

Designated CH (critical habitat) is not present in the project area, although there is CH in the Verde River adjacent to the project area. The Verde River is CH for the razorback sucker from Perkinsville downstream to Horseshoe Reservoir (U.S. Fish and Wildlife Service 1994). Water quantity and quality are being affected by land development, surface water diversions, and groundwater withdrawals in the watershed and along the river. Physical habitat in the river is mainly affected by major flooding events and subsequent drought periods. Recent flooding in winter of 2004 – 2005 restructured habitats throughout the Verde River. The biological environment in this reach of the river is out of balance due to introduced non-native fishes that are a source of predation and competition to native fish species.

Direct and Indirect Effects

All Alternatives: There would be no direct effects to CH because it is not present in the project area and livestock are excluded from accessing the Verde River. Watershed analysis of the Verde River 5th code watersheds on the Forest conclude that activities in the uplands, including livestock grazing, are not having a discernable effect on the river at this time (USDA Forest Service 2001, Rocky Mt Research Station 2001). These Alternatives would not result in any measurable indirect effects to water quality parameters and would not change the existing aquatic habitat conditions or alter the existing fish community composition and population trends. Thus, these alternatives would not have any measurable effects to CH in the Verde River.

Cumulative Effects

All Alternatives: The cumulative effects area is the same as noted above for the fish species. With no direct or measurable indirect effects to these species, there would be no contribution from this project to cumulative effects.

Southwestern willow flycatcher (Endangered/PIF)

The SWWF (Southwestern willow flycatcher) is a riparian obligate species that requires dense habitat of willows and other native/nonnative trees and shrubs situated along rivers, streams, and other wetland areas. There is no occupied or proposed critical habitat within the project area. Riparian habitats in Copper Canyon, Chasm Creek, Cienega Creek, and Arnold Canyon are narrow stringers of riparian vegetation with steep gradients (>5%) and narrow floodplains that do not provide potential habitat for SWWF. The nearest occupied SWWF site occurs on private lands along the Verde River in Camp Verde about 2-miles north of the project boundary. The Camp Verde site is surrounded by an abundance of high quality BHC (brown-headed cowbird) foraging habitat such as agricultural fields, short-grass lawns, bird feeders, livestock corrals and pastures; and high quality breeding habitat from extensive riparian habitat along the Verde River. Lower pastures on the Copper Canyon Allotment and the entire Young Allotment have been deferred from grazing (annually since 1998) during the SWWF critical season (April 1 to July 31) to mitigate for potential nest parasitism by BHC.

Direct and Indirect Effects

All Alternatives: There are no direct effects to SWWF because they do not occur in the project area.

Alternative 1: With no livestock grazing in the project area, there would be no indirect effects from BHC nest parasitism to SWWF at the Camp Verde site.

Alternatives 2, 3, 4, 5: With livestock grazing in the project area, the alternatives would not have any measurable effects of BHC parasitism to SWWF at the Camp Verde site because of the application of the mitigation measure of a 2-mile buffer (U.S. Fish and Wildlife Service 2004) during the SWWF critical season for livestock activities in the project area (Chapter 2 - Mitigation).

Cumulative Effects

The cumulative effects area includes a 2-mile radius from the SWWF nesting site on the Verde River in Camp Verde. The main impacts within the site are from ATV user created trails that criss-cross the area (SWCA, Inc., Environmental Consultants 2000; R. Valencia 2005). This activity can impact SWWF because of direct and/or indirect disturbance to the species during the nesting season and reduction in riparian habitat quality/quantity from ATV trampling of vegetation. SRP (Salt River Project) has recently purchased 124 acres that contains the SWWF site and is drafting a Management Plan to address issues/impacts to the site (R. Valencia 2005). In addition, BHC trapping has been implemented in the area as mitigation for the Harvard Investments (now called Simonton Ranch) proposed housing development adjacent the site. These actions would help to reduce disturbance to the species during the nesting season and improve riparian habitat at the site which is a beneficial effect to the SWWF.

All Alternatives: With no direct or measurable indirect effects to these species, there would be no contribution from this project to cumulative effects.

Yellow-billed Cuckoo (Sensitive/PIF)

The YBC (Yellow-billed cuckoo) is a riparian obligate species that occurs mainly in mature gallery forests of cottonwood-willow communities. YBC are a migratory bird in Arizona, arriving the first week of June and typically depart by late August or early September. The species was recorded in Arnold Canyon near Arnold Place Spring in 2002 surveys (PR#43). This area is within the Arnold Pasture, Bald Hill Allotment, and is a winter use only pasture. Riparian habitats in Copper Canyon, Chasm Creek, Cienega Creek, and lower Arnold Canyon are narrow stringers of riparian vegetation with steep gradients (>5%) and narrow floodplains that do not provide potential habitat for YBC.

Direct and Indirect Effects

All Alternatives: There would be no direct effects to species because livestock grazing would not occur during the YBC nesting season of June through August.

Alternative 1, 4, 5: With no livestock grazing in the project area or with fencing to exclude livestock grazing from YBC habitat, there would be no indirect effects to the species.

Alternative 2, 3: With livestock grazing in the project area, utilization levels would provide for regeneration of riparian trees for YBC habitat but at less potential than alternatives 1, 4, and 5 because of grazing and trampling impacts to young trees. Currently, riparian habitat is a small stand of mature, high canopy trees. YBC habitat quality would be maintained similar to existing conditions.

Cumulative Effects

The cumulative effects for the YBC include activities that would impact the species or its habitat in the project area. There are no identified activities in the Arnold Canyon area that would have cumulative effects to the species.

Alternative 1, 4, 5: With no direct or indirect effects to the species, there would be no contribution from this project to cumulative effects of the above activities.

Alternatives 2, 3: With no direct effects and minimal indirect effects to the species, there would be no contribution from this project to cumulative effects of the above activities.

Lowland leopard frog (Sensitive) and Arizona toad (Sensitive)

The LLF (lowland leopard frog) occurs in Chasm Creek, Copper Canyon, upper Cienega Creek, and Joe Best Spring in the project area (PR# 29, 40, 43). No AZT (Arizona toad) was observed during surveys but they have been documented in the project area vicinity (Sullivan 1993) and have a high probability of occurring in these drainages. There are no livestock grazing impacts to occupied habitat within Chasm Creek, upper Cienega Creek, Joe Best Spring, and portions of Copper Canyon because of limited access due to rough terrain or riparian exclosures. The lower reach of Copper Canyon within the Tompkins pasture, Copper Canyon Allotment, has some accessible reaches and has recently been assigned for winter-use only.

Direct and Indirect Effects

Alternative 1: With no livestock grazing in the project area, there would be no direct effects to the species. LLF and AZT habitat quality would improve in accessible reaches of Copper Canyon because of an increase in herbaceous vegetation and improved streambanks needed for cover. This Alternative may increase the local population.

Alternatives 2, 3, 4, 5: With livestock grazing in the project area, there may be some disturbance to individuals and trampling impacts to habitat because of livestock grazing or trailing in accessible reaches along Copper Canyon but such impacts would be minimal because of limited access to the canyon on the Bald Hill Allotment and from exclosures and a recent change to winter-use only on the Tompkins Pasture on the Copper Canyon Allotment. In addition, there are no livestock grazing impacts to riparian/aquatic habitat within Chasm Creek due to limited access and rough terrain (PR#117).

Cumulative Effects

The cumulative effects for the LLF and AZT include activities that would impact the species or its habitat in the project area. Jersey barriers have been installed at road crossings along Copper Canyon to stabilize the drainage system and helped to maintain and improve riparian function which is a beneficial effect to LLF and AZT.

Alternative 1: With no direct and indirect effects, there would be no contribution to cumulative effects on this species from this project.

Alternatives 2, 3, 4, 5: With non-measurable direct and indirect effects because of the limited habitat affected there would be no contribution from this project to cumulative effects.

Mearns sage (Sensitive) and Hualapai Milkwort (Sensitive)

The Mearns sage occurs at several sites in the Lucky Pasture, Copper Canyon Allotment (USDA Forest Service 2003a). The Hualapai milkwort also occurs in the Lucky Pasture in association with Verde Valley sage and along a section of Forest Trail 521 near Ryal Spring (USDA Forest Service 2003a). Populations are all considered healthy. The Lucky Pasture is not assigned any livestock capacity due to limitations of soils to forage production and inherently unstable soils. The milkwort is distasteful to livestock (Kearney and Pebbles 1960).

Direct and Indirect Effects

Alternative 1: With no livestock grazing in the project area, there are no direct or indirect effects to the species.

Alternatives 2, 3, 4, 5: With livestock grazing in the project area there would be minimal impacts to plants or habitat from incidental grazing, trampling, and trailing. These Alternatives may impact individuals but would not impact the local population or the species.

Cumulative Effects

The cumulative effects for the Mearns sage and Hualapai milkwort include activities that would impact the species or its habitat in the project area. There are no identified activities in the Lucky Pasture or Ryal Springs area that would have cumulative effects to the species.

All Alternatives: With no direct or measurable indirect effects to the species, there would be no contribution from this project to cumulative effects.

Management Indicator Species (MIS)

Forest level habitat and population trends for Management Indicator Species (MIS) were discussed in *Forest Level Analysis of Management Indicator Species for the Prescott National Forest (PR#72)* and excerpted for the following MIS analyzed in the project area. The mule deer is the MIS for early seral Pinyon/Juniper vegetation. The juniper (plain) titmouse is the MIS for late seral and the snag component of Pinyon/Juniper vegetation. Lucy’s warbler is the MIS for late seral riparian vegetation.

Table 3.3 Summary of Vegetation Seral Stage Changes for MIS Habitat on the PNF from 1987 through 2003

Vegetation Type	1987 Acres	2003 Acres	% Change	Habitat Trend
Pinyon/ Juniper	683,795	Late to early change = 13,445 acres	-2.0	Stable
Riparian	17,160	Early to late change = 1,624 acres	9.5	Up

Table 3.4 Estimated population trend for MIS at the forest level (2003)

Population Trend	Management Indicator Species
Decreasing	Mule deer

Stable	Lucy's warbler
Stable	Juniper (Plain) titmouse

Table 3.5 Effects to MIS habitat by Alternative (Acres/% Change)

MIS Species	Current Forest-wide Habitat	Acres of Habitat in Project Area	Alt. 1 Acres Affected / % of Change Forest-wide	Alt. 2 Acres Affected / % of Change Forest-wide	Alt. 3 Acres Affected / % of Change Forest-wide	Alt. 4 & 5 Acres Affected / % of Change Forest-wide
Mule Deer	683,795	27,145	0	0	3768 / 5	0
Juniper titmouse	683,795	27,145	0	0	- 3768 / - 5	0
Lucy's warbler	17,160	161	50 / 0.3	-50 / -0.3	- 50 / - 0.3	50 / 0.3

Mule Deer (MIS – early seral pinyon/juniper vegetation)

Alternative 1, 2, 4, and 5: These alternatives would result in no change in the seral stage of habitat for mule deer, thus there would be no effects to Forest-wide habitat and population trends.

Alternative 3: This Alternative would result in a small (<1%) increase in habitat quantity for mule deer because of 3768 acres of juniper treatments that would result in change from late to early seral stage. However, the total increase is too small to alter Forest-wide habitat and population trends.

Juniper (Plain) Titmouse (MIS/PIF – late seral and snag component of pinyon/juniper)

Alternative 1, 2, 4, and 5: These Alternatives would result in no change in the seral stage of habitat for juniper titmouse, thus there would be no effects to Forest-wide habitat and population trends.

Alternative 3: This Alternative would result in a small (<1%) decrease in habitat quantity for juniper titmouse because of 3768 acres of juniper treatments that would result in change from a late to early seral stage. However, the total decrease is too small to alter Forest-wide habitat and population trends.

Lucy's Warbler (MIS/PIF – late seral riparian vegetation)

Alternative 1, 4, 5: These Alternatives would result in a small (<1%) increase in habitat quantity and quality for Lucy's warbler because riparian areas, primarily along Arnold Canyon, would not

be grazed and would result in a change to a later seral stage. However, the total increase is too small to alter Forest-wide habitat and population trends.

Alternative 2, 3: These Alternatives would continue to limit a small (<1%) area of riparian habitat quantity and quality for Lucy's warbler because riparian areas, primarily along Arnold Canyon, would be grazed and would result in less potential for regeneration of riparian tree to mature to a late seral stage. However, the total increase is too small to alter Forest-wide habitat and population trends.

Migratory Birds

PIF (Partners in Flight) has identified physiographic areas and high priority bird species by broad vegetation habitat types. The criteria for identifying priority bird species was based on relative abundance, breeding distribution, winter distribution, threats on breeding grounds, threats on non-breeding grounds, threats on winter grounds, and the importance of Arizona to each species.

The PNF provides nesting habitat for a host of migratory birds each spring and summer. Several PIF priority species also are PNF MIS or Regional Forester's Sensitive species. The PNF uses these PIF bird species as indicators for migratory birds. Assessing the impacts of a project on these PIF bird species meets the intent of the Migratory Bird Treaty Act. With regards to addressing additional bird species for this project, there is no indication that any of the proposed activities would cause major changes in vegetation or overall loss of habitat diversity. For this reason, the assessment of migratory birds is limited to those species on the federally listed, sensitive or MIS lists. See the individual affects analyses above for the Southwestern willow flycatcher, Yellow-billed cuckoo, Juniper (plain) titmouse, and Lucy's warbler the only migratory species potentially impacted by the project.

OTHER RESOURCES

Air Resources: There would be little or no effect to air resources because there would be no increases in bare ground that would contribute to dust and the prescribed burning in Alternatives 3, 4, and 5 would follow smoke management guidelines (PR#118).

Wilderness Resources: Approximately 3800 acres of the Cedar Bench Wilderness are a part of the Squaw Peak Allotment and grazing in the wilderness is an accepted practice allowed by the Wilderness Act.

Livestock use is limited due to steep, rocky slopes, thick woodland vegetation, and the general lack of reliable water. Use by people is also light due to its remote location and difficult to get to access points as well as the lack of available potable water.

Since this wilderness is hard to get to by both livestock and people the area is not overused by either. The wilderness character is mostly present and with not a lot of human influence in the area there are opportunities for solitude and/or a primitive, unconfined types of recreation (PR #115).

Verde Wild and Scenic River: Approximately 40 acres of the Verde Scenic River corridor are located within the formal boundaries of the Squaw Peak Allotment. This area (encompassing Beasley Flat) is a developed recreation day use/river access area and has been wholly fenced

since 1996, thereby fully excluding the area from livestock grazing (PR#116). Therefore, there would be no direct, indirect or contributions to cumulative effects.

Heritage Resources: There will be no effect to known heritage resources because of the dispersed nature of livestock grazing, lack of any sites where range improvements are proposed and the consultation/surveys necessary for any future ground disturbing activity related to this project (PR#129).

OTHER FINDINGS

Public Health and Safety: Management concerns regarding public health and safety are not identified in the Purpose and Need for the Action (Chapter 1), nor is public health and safety identified as a public issue (Chapter 1, PR# 61). Therefore, it is concluded that public health and safety will not be significantly affected.

Prime Farmlands: Prime farmlands are determined based upon various factors such as soil parent material, soil depth, climatic regime, slope, and plant community. The presence or absence of areas within the project area that could be classified as prime farmlands was determined by analysis of existing ecological condition plot data collected for the Terrestrial Ecosystem Survey (TES) and for the Ecological Classification of the Prescott National Forest, as well as field data collected during range inspections. No prime farmlands were identified as a result of this review.

Range Structures: There are no proposed new range structures in Alternatives 1 and 2. Alternative 3, 4, and 5 propose structures that are identified in Chapter 2. Indirect effects were accounted for when predicting the vegetation, soil and water quality/quantity effects as they relate to livestock distribution. The existing range water collection devices would have a very minimal impact upon water quantity from a watershed scale. The proposed range improvements direct effects associated with Alternative 3, 4 and 5 have the potential to produce minimum negative impacts upon vegetation, soil and water conditions in the short term. The disturbance associated with the impacts of constructing these improvements has a minimal potential to compact soils and decrease VGC. A potential increase of run off, erosion, and degradation of water quality and quantity would be mitigated by implementing Best Management Practices (BMPs). BMPs have been developed and are located in Appendix 1 – Best Management Practices.

Economics: The Verde Rim allotments are located in Yavapai County, which is a rapidly growing non-metropolitan county. As a result of the rapid population growth, the county is economically diverse. Now a majority of employment comes from service and professional/technical occupations rather than ranching and farming.

Employment by occupation

	Percent of Total
Government	20.6
Trade, Transportation & Utilities	19.5
Education & Health Svcs	15.9
Leisure & Hospitality	13.5
Construction	10.6
Professional & Business Svcs	08.0
Manufacturing	06.2
Financial Activities	03.6
Natural Resources (including livestock grazing)	01.8

Source: Arizona Department Commerce 2003

Ranching operations in this area tend to be characterized by small profit margins with the need for off-ranch supplemental income in order to continue operations. Because these operations are small in relation to the county economy as a whole, there is no discernible impact on the local economic structure with or without the operations.

Likewise, there is no discernible impact on the local social structure of the county due to the small size of the project in relation to the County's diversified social structure.

While there are no discernable economic or social impacts at the county level, there are resource benefits and potential impacts at the local level. Water developments on the allotments, especially in the upland areas, aids in the distribution of various wildlife species and can lead to increased wildlife presence. For this reason, Arizona Game and Fish Department financially supports many of these water developments.

When the Forest Service allows livestock management on an allotment, the livestock permittee may have an improved ability to maintain his/her private land as open space. As open space, resources such as wildlife and fish habitat, visual and air quality are preserved. Rural areas such as the permit holder's private lands are prime candidates for subdivision development as evidenced by the continuous development activities through out northern Arizona. If the private land ranch were to go out of operation, it is possible these lands would be subdivided and open space values lost.

Environmental Justice: A specific consideration of equity and fairness in resource decision-making is encompassed in the issue of environmental justice and civil rights. As required by law and Executive Order, all Federal actions should consider potentially disproportionate effects on minority or low-income communities, minority groups, women, and consumers. Where possible, measures should be taken to avoid negative impacts to these communities and groups or mitigate the adverse affects.

The project area is not within a concentrated area of low income, high unemployment, or high poverty (Table 3.6). Therefore, none of the alternatives would result in any disproportionate impacts to low-income or minority populations and women. However, there may be an adverse impact to individual permittees and local consumers, depending on the alternative that is selected for implementation.

Table 3.6 - Population Trends and Economic Levels

	United States	Arizona	Yavapai Co.
% Unemployed	3.7	3.4	2.7
% Families Below Poverty Level	9.2	9.9	7.9
% Individuals Below Poverty Level	12.4	13.9	11.9
% Minorities	22.9	36.2	13.4

¹ Source: U.S. Bureau of Census. Census 2000 Summary File (SF 3) - Sample Data. Minority Data Source: U.S. Bureau of Census, 2000. Census 2000 Redistricting Data (PL94-171) Summary File, and Profiles of Gener

APPENDICIES

1. Best Management Practices
2. Threatened, Endangered, and Sensitive Species not Affected by Project
3. References Cited
4. Maps

APPENDIX 1 BEST MANAGEMENT PRACTICES

Soil and water conservation measures are means to comply with the Non-Point Source Section of the Clean Water Act and the Intergovernmental Agreement (IGA) signed by the Forest Service (R3) and the Arizona Department of Environmental Quality (ADEQ) (Jolly et al, 1990). As per the IGA, the most practical and effective means of controlling potential non-point source pollution is through the development of Best Management Practices (BMPs). The general BMP categories were largely derived from the Forest Service Handbook but were supplemented and modified to meet project needs. The number affiliated with each BMP references Southwestern Region FSH 2509.22.

The following BMPs will be employed. Practice numbers and titles are followed by a brief explanation of site-specific application plans.

22.0 Range Management

The development of Alternatives considered soil and water conservation practices. These practices are integrated in the management actions of each Alternative. The management parameters considered for soil and water conservation practices utilize the adaptive management concept to achieve attainable desired conditions. Some management strategies considered are: discouraging use on unsatisfactory soils, assigning stocking levels, improving livestock distribution, creating deferred rotations, setting utilization standards, and adjusting season and duration of use.

22.1 Range Analysis, Allotment Management Plan, Grazing Permit System, and Permittee Operating Plan.

An interdisciplinary approach was used in an analysis of alternatives. The forest plan and other policy and procedural guidance were reviewed. The scope of the project was narrowed to livestock grazing management and included effects on vegetation, watershed/soils, and wildlife. The chosen alternative will be incorporated into 10-year term Permits for each allotment analyzed. Annual operating instructions will be utilized to implement the permits.

22.11 Controlling Livestock Numbers and Season of Use.

Livestock will be managed to respond to fluctuations in weather, and resultant variances in forage production. Stocking levels will be adjusted up or down based on Rangeland Health Inspections and/or Soil Condition Field Sheet. Season of use is rotated among pastures generally using a deferred rotation system and utilization guidelines will be employed.

22.12 Controlling Livestock Distribution.

Pasture fencing and natural barriers are used to control the distribution of grazing on all allotments. Distribution within each pasture occurs by controlling access to water, by herding, and by locating salt to encourage use of side slopes or other areas of unused forage.

22.13 Rangeland Improvements.

Existing waters and fences will be reconstructed and maintained as needed. Adaptive management strategies may lead to constructing new facilities in order to achieve the desirable attainable effects.

22.14 Determining Grazing Capability of Lands.

The Terrestrial Ecosystem Survey (TES) was used to determine site characteristics and attainable potential condition which is the ecological capability of the land. Adaptive management strategies will be implemented so livestock grazing does not prevent soil condition improvement or adversely affect vegetative cover and diversity.

22.15 Revegetation of Areas Disturbed by Grazing Activities.

No revegetation of grazed areas is expected to be necessary. Natural vegetation expansion resulting from improvements in livestock management and timing of grazing use will result in desired conditions.

25.12 Protection of Wetlands and Riparian Areas.

Grazing effects of riparian areas are controlled through adaptive management techniques such as season and duration of use and/or riparian exclosures.

25.2 Evaluation of Cumulative Watershed Effects.

The cumulative effects for soils and water quantity and quality were analyzed from a watershed scale.

Range Improvement Installations

The following BMP's provide general guidelines for newly constructed range improvements. Range improvements may be constructed as an adaptive management technique.

24.22 Special Erosion Prevention Measures on Disturbed Land

All areas of surface disturbance will be treated following completion to prevent erosion. Areas will be ripped or scarified, and smoothed or sloped to return the areas to its natural contours, if deemed necessary.

24.16 Streamside Management Zone

All areas within 150 feet of a riparian area are in a streamside management zone. These areas require special soil and water conservation prescription prior to implementation.

25.16 Soil Moisture Limitations

All operations will be conducted during periods when the probabilities for precipitation, wet soils, and runoff are low.

25.18 Revegetation of Surface Disturbed Areas

All areas that have disturbance will be evaluated to determine if reseeding is necessary or if natural recruitment is adequate. TES will be used to determine the appropriate grass seed specification.

24.3 Slash Treatment in Sensitive Areas

All areas will be mulched with vegetation slash, certified weed free hay, or any other material deemed appropriate

24.14 Protection of Extremely Unstable Lands

Range improvement installation locations will avoid unstable lands. Unstable lands that are unavoidable will require special erosion control measures.

41.25 Maintenance of Roads

Road maintenance will concentrate on improving drainage. Road drainage measures will not channel run-off directly into streamcourses. This includes out-sloping the road and maintaining leadoff ditches. Roadwork will not occur during wet or storm conditions.

31.13 Prescribe Burn

The following BMPs provide general guidelines for the proposed prescribed fire in Alternative 3, 4 and 5.

Burn prescriptions will be done so that all of the organic matter is not consumed and in a mosaic pattern.

Burnt sites will be inspected to determine if areas need reseeding or whether any other soil conservation practices are required.

31.0 Fire Recovery

Recovery/Establishment: Livestock use will not be permitted until the soils and vegetation have recovered (USDA & USDI, 2002).

Grazing Management After Recovery/Establishment Period: An evaluation is required at the end of the second growing season to determine if additional practices are needed (USDA & USDI, 2002).

24.0 Juniper Treatment

The following BMPs provide general guidelines for the proposed juniper treatment in Alternative 3.

All operations will be conducted during periods when the probabilities for precipitation, wet soils, and runoff are low.

All areas within 150 feet of a riparian area are in a streamside management zone. These areas require special soil and water conservation prescription prior to implementation.

All juniper slash will be retained on site to protect the soil surface from soil erosion and improve infiltration rates.

APPENDIX 2
THREATENED, ENDANGERED and SENSITIVE PLANTS and ANIMALS
MANAGEMENT INDICATOR SPECIES
NOT AFFECTED BY THE PROJECT

Prescott National Forest

Scientific name	Common name	Status
<i>Poeciliposis o. occidentalis</i>	Gila topminnow	E
<i>Haliaeetus leucocephalus</i>	Bald eagle	T
<i>Strix occidentalis lucida</i>	Mexican spotted owl	T
<i>Meda fulgida</i>	Spikedace	T
<i>Tiaroga cobitis</i>	Loach Minnow	T
<i>Gila intermedia</i>	Gila chub	PE
<i>Falco peregrinus</i>	American peregrine falcon	S
<i>Cicindela oregona maricopa</i>	Maricopa tiger beetle	S
<i>Thamnophis rufipunctatus</i>	Narrowheaded garter snake	S
<i>Xantusia vigilis arizonae</i>	Arizona night lizard	S
<i>Pyrgulopsis glandulosa</i>	Verde Rim springsnail	S
<i>Agave delamateri</i>	Tonto Basin agave	S
<i>Chrysothamnus molestus</i>	Tusayan rabbitbrush	S
<i>Erigeron saxatilis</i>	Rock dwelling fleabane	S
<i>Eriogonum e. var. ericofolium</i>	Heathleaf wild buckwheat	S
<i>Eriogonum ripleyi</i>	Ripley wild buckwheat	S
<i>Hedeoma diffusum</i>	Flagstaff pennyroyal	S
<i>Heuchera eastwoodiae</i>	Eastwood alum root	S
<i>Lupinus latifolius spp. leucanthus</i>	Broad-leafed lupine	S
<i>Phlox amabilis</i>	Arizona phlox	S
<i>Arenaria abberrans</i>	Mt. Dellenbaugh sandwort	S
<i>Accipiter gentilis</i>	Northern goshawk	S/MIS/PIF
<i>Sciurus aberti</i>	Abert squirrel	MIS
<i>Sitta pygmyaea</i>	Pygmy nuthatch	MIS
<i>Meleagris gallopavo</i>	Turkey	MIS
<i>Picoides villosus</i>	Hairy woodpecker	MIS

*** Status Definitions:**

- ◆ **E** Listed Endangered under the ESA: Any species that is in danger of extinction throughout all or a significant portion of its range.
- ◆ **T** Listed Threatened under the ESA: Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- ◆ **PE** Proposed Endangered under the ESA: Any species that is proposed in the Federal Register to be listed under Section 4 of the Endangered Species Act.
- ◆ **C** Candidate Taxon, Ready for Proposal.
- ◆ **S** Sensitive: Those species listed on the Regional Forester's Sensitive Species list for the Southwestern Region of the Forest Service.
- ◆ **MIS** Management Indicator Species: Species identified in the PNF FLMP FEIS (page 95) for various vegetation types and seral stages.
- ◆ **PIF** Partners in Flight priority bird species (Latta, 1999)

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United States
USDA Department of
Agriculture

Forest Service

**Southwestern
Region**

Prescott
National
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Verde
Ranger
District

2006



VERDE RIM LIVESTOCK GRAZING ENVIRONMENTAL ASSESSMENT

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VERDE RIM LIVESTOCK GRAZING PROJECT

Environmental Assessment

USDA Forest Service
Prescott National Forest, Verde Ranger District
Yavapai County, Arizona

CHAPTER 1 - PROJECT SCOPE

Introduction:

The Verde Rim Livestock Grazing Project is collectively made up of the Bald Hill, Copper Canyon, Squaw Peak, and Young Allotments located on the Verde Ranger District, Prescott National Forest (Figure 1, Verde Rim Grazing Allotments). The combination of these allotments into a single analysis is based upon geographic proximity and the similarity of both the ecology and the patterns of human activities in the area.

Details of the analysis conducted for this project are contained in the project record (PR), located at the Verde Ranger District Office, 300 East Highway 260, Camp Verde, Arizona. This record is incorporated by reference into this environmental assessment in its entirety.

The project area is situated South of Camp Verde, Arizona in T12, 12 ½, and 13 N, R 4 and 5E, Gila and Salt River Meridian and involves approximately 39,480 acres within the boundaries of the Prescott National Forest (Bald Hill 15,711 acres, Copper Canyon 10,205 acres, Squaw Peak 12,600 acres, and Young 964 acres). A portion of the Cedar Bench wilderness area and the Verde Scenic River are within the project area (Squaw Peak Allotment). The analysis area also includes portions of the Cherry Creek-Upper Verde River, Fossil Creek-Lower Verde River, and Ash Creek-Sycamore Creek 5th level watersheds, as well as State and private land parcels that are not administered by the Forest Service. However, the proposed action is limited to activities on the Forest Service administered lands.

Livestock have grazed this area for over a century. Settlement along the Verde River and homesteads at reliable water sources away from the river in the 1860's brought the introduction of domestic livestock that resulted in high stocking rates until the 1890's when severe drought depleted the herds. Grazing at more controlled stocking rates has continued into modern times (PR#126). Table 1.1 illustrates the season of use, permitted numbers and stocking levels over the past 10 years for each allotment. The numbers are representative of the drought years.

TABLE 1.1 – Season of Use, Permitted Numbers, and Stocking Levels

Allotment	Bald Hill	Copper Canyon	Squaw Peak	Young
Permitted #	172	100	90	9
Head Months	2064	1200	1080	108
Season of Use	3/1 - 2/28 (yearlong)	3/1 - 2/28 (yearlong)	3/1 - 2/28 (yearlong)	3/1 - 2/28 (yearlong)
Year	Head Months (Permitted # x 12 months)			
2004	1008	480	240	0
2003	963	480	134	0
2002	1244	640	134	0
2001	2064	960	900	108
2000	2064	900	900	82
1999	2070	900	1083	110
1998	1203	720	1083	0
1997	1423	1200	1095	0
1996	0	770	1095	0
1995	0	1200	414	110
10-year Average	1204	825	708	41

The Copper Canyon, Squaw Peak and Young Allotments are on the east side of the Verde Rim and run from the alluvial fans near the Verde River to the steep slopes at the top of the Rim west of the River. The Bald Hill Allotment is on the west side of the Verde Rim adjacent to the Copper Canyon Allotment.

The Bald Hill Allotment is one of the 29 problem allotments identified in the Prescott National Forest Land Management Plan (LMP), supporting Environmental Impact Statement (EIS) and Forest Planning records. Bald Hill Allotment was identified as problematic because of minor overstocking, unsuccessful rotation schedules, and the need to reduce juniper density (PR# 133). The allotment was rated as second priority because a new allotment management plan (AMP) addressing these findings was prepared (but not fully implemented) during the Forest Planning process. Since that AMP was implemented juniper density has been reduced and management improved, resulting in upward trends. The allotment currently meets the Forest Plan definition for satisfactory condition (PR# 1 pg 32) and this analysis will confirm the continued satisfactory condition while updating the AMP.

Data collection, analysis, consultation, and public/permittee participation has been ongoing for a number of years. The project was first placed on the Prescott National Forest's Schedule of Proposed Actions (SOPA) in 1998 and has been listed in every quarterly SOPA since then. Grazing permit holders and the public were involved in scoping and development of alternatives through 2002. An Interdisciplinary Team (IDT) completed the environmental analysis (EA) in 2004. Decisions regarding grazing management for each of the allotments involved in the project were made by the District Ranger on September 30, 2004. Three individuals and an environmental organization appealed the decisions. The Appeals Deciding Officer (Prescott National Forest Supervisor) reversed the decisions and returned the EA back to the District

Ranger for further analysis, increased documentation and new decisions (PR#109). This current EA represents that further analysis and documentation.

Purpose and Need for Action:

The purpose of the proposed action is to:

- Authorize continued livestock grazing on the Bald Hill, Copper Canyon, Squaw Peak, and Young Allotments.
- Establish permitted stocking, season of use, and grazing system for each allotment.
- Issue new 10-year term grazing permits for those allotments.

There is a need to:

- Increase or maintain VGC and perennial grass composition and cover in pinyon/juniper woodlands, desert shrub/grassland, and chaparral communities to the extent attainable with the existing tree/shrub canopy.
- Improve soil function to enhance soil conditions.
- Allow riparian vegetation to reach or move towards potential.
- Allow channel profiles to return to appropriate dimensions for site morphology and channel functions.
- Adjust the currently permitted livestock numbers to provide flexibility to adjust for fluctuations in available water and forage.
- Determine appropriate allowable use/utilization levels.
- Respond to regulations [36 CFR 222 Subpart A, 222.2 (c)] that direct the Forest Service to make forage available for livestock under direction contained in the Land Management Plan of the Prescott National Forest.
- Respond to Section 504 (a) of the 1995 Rescission Act (Public Law 104-19) that requires the agency to complete National Environmental Policy Act (NEPA) analysis and decision on all grazing allotments.

Proposed Action:

This is the Proposed Action that was sent to the public for scoping in 2002. Alternatives to this Proposed Action are displayed in Chapter 2.

The Verde Ranger District of the Prescott National Forest proposes to...

1. Permit continued livestock grazing on the Bald Hill, Copper Canyon, Squaw Peak, and Young Grazing Allotments.
 - a. Issue new 10-year term grazing permits for each of the allotments.
 - b. Provide for year-round grazing.
 - c. Allow for fluctuations in available water and/or forage dictated by changing weather by authorizing use within the range of 130 – 172 mature cattle on Bald Hill, 80 – 100 mature cattle on Copper Canyon, not to exceed 60 mature cattle on Squaw Peak, and not to exceed 108 animal months on Young.
 - d. Maintain a 5 pasture deferred rotation system (Pinto Mesa, Bates/Bull, Durfee, Bald Hill, Arnold) on the Bald Hill Allotment, keeping the Arnold Pasture winter use only due to the limited grass in the pasture. During the growing season keep the grazing period in any pasture as short as possible, allowing for multiple entries into some pastures.
 - e. Maintain a 4 main pasture deferred rotation system (Copper Canyon, Tompkins, Box T, Cottonwood) on the Copper Canyon Allotment using two pastures (Monroe, Lucky) in conjunction with the main pastures while keeping the Tompkins Pasture in winter use only.
 - f. Maintain management on the Squaw Peak Allotment as a whole since topography does not lend itself to division into pastures. Defer areas from grazing on the lower part of the allotment by using only one water pipeline at a time. Either the North Mine Spring pipeline or the Lower Mine Spring pipeline will be shut off each growing season (spring or summer) to allow the area serviced by the pipeline to be rested.
 - g. Maintain existing management on the Young Allotment using the allotment during the winter/spring months (January – April) and occasionally the fall months (October – November). Provide deferment by avoiding grazing during the same growing season more than two years in a row.
 - h. Establish utilization levels on Bald Hill and Copper Canyon Allotments of:
 1. 40% use of current year's production on key forage species during periods of growth and 50% during non-growth periods maintaining 70% of height on herbaceous riparian species after the growing season.
 2. 50% use of current year's production on upland browse species.
 3. 20% use of current year's production on riparian browse species.
 - i. Establish utilization levels on Squaw Peak Allotment of:
 1. 30% of current year's production on key forage species during periods of growth and 50% during non-growth periods.
 2. 50% use of current year's production on upland browse species.

- j. Establish utilization levels on Young Allotment of:
 1. 40% use of key forage species.
2. Use fencing, prescribed burning, and juniper cutting to maintain/improve riparian conditions, vegetative ground cover, and watershed conditions.
 - a. Extend the riparian enclosure on Cienega Creek in the Bald Hill Pasture (Bald Hill Allotment) north to the division fence, while leaving access for cattle watering.
 - b. Extend the riparian enclosure at Reimer Spring in the Bald Hill Pasture (Bald Hill Allotment) downstream, while leaving access for cattle watering.
 - c. Conduct juniper reduction on approximately 2,560 acres on the Bald Hill Allotment using a combination of hand and mechanical felling to improve watershed conditions through increased growth and spread of vegetative ground cover.
 - d. Conduct juniper reduction on approximately 147 acres in the Copper Canyon and Tompkins Pastures of Copper Canyon Allotment using a combination of hand and mechanical felling to increase growth and spread of vegetative ground cover.
 - e. Prescribe burn approximately 909 acres in the Copper Canyon Pasture (Copper Canyon Allotment) to reduce prickly pear cactus, juniper, and mesquite in order to sustain existing herbaceous ground cover.
 - f. Conduct juniper reduction on approximately 1,061 acres in the Squaw Peak Allotment using a combination of hand and mechanical felling to increase growth and spread of vegetative ground cover.
3. Construct $\frac{3}{4}$ mile of fence on the Bald Hill Allotment to re-create the small pasture (Horse) south of the private land for bulls, heifers, and/or cattle shipping.

Decision Framework:

The Verde District Ranger, as the responsible official for the Bald Hill, Copper Canyon, Squaw Peak, and Young Allotments, will decide:

- a. Whether to authorize continued livestock grazing on the Verde Rim Livestock Grazing Project allotments.
- b. If livestock grazing is authorized, which management practices and mitigation measures will be prescribed in the Allotment Management Plans, including permitted livestock stocking, season of use, livestock facilities to be constructed, and term of the permits.

- c. Whether the selected alternative may have significant environmental effects and whether to prepare an Environmental Impact Statement.

Separate decisions may be made for each allotment or for all four allotments, combined.

In accordance with Forest Service Handbook direction [FSH 1909.15(18)] an interdisciplinary review of the decision will occur within 10 years or sooner if conditions warrant. If this review indicates that management is meeting standards and achieving desired conditions, the initial management activities will be allowed to continue. If monitoring demonstrates that management options beyond the scope of the analysis are warranted, or if new information demonstrates significant effects not previously considered, further analysis under the National Environmental Policy Act will occur. Future physical improvements not disclosed or analyzed herein would require site-specific analyses and decisions.

Public Involvement:

This project has been listed in the Prescott National Forest's Schedule of Proposed Actions (SOPA) since October 1998 through to the most recent release.

Initial scoping of affected grazing permit holders was initiated in August 1997 in preparation for annual permittee meetings that were scheduled and held during October – March 1997-1998 (PR# 2,3). Scoping of internal resource specialists began under letter of October 19, 1998 establishing an interdisciplinary team and continued with the development of a project cover sheet in August 2001 (PR#4, 18). This scoping process was used to define the size and dimension of the proposal, determine the complexity of the analysis and to identify management concerns. The timeline for completion of the analysis was extended to better analyze the effects of the ongoing drought, and to determine an attainable herbaceous potential for these allotments.

Information on existing conditions was collected during 1999-2001 and was used by the Interdisciplinary Team (ID Team) to develop a proposed action for each allotment utilizing the field data and permittee input garnered from annual grazing validation meetings and field monitoring meetings. The proposed actions were combined into a single proposed action for the entire project area and sent to 41 individuals, organizations, State and Federal agencies, and affected permittees for review and comment in January 2002 (PR#32). Three individuals, three organizations, one State and one Federal agency responded. No affected permit holders formally responded.

The ID Team reviewed all the letters received and prepared a “response to comments” document along with an outline of alternatives (PR#s 61, 62). These documents were sent out to the respondents and affected permit holders in September 2002 (PR#63, 64). The affected permit holders were not among the few who responded to this document, either.

Permittees, however, have chosen to be informally involved in the analysis through the annual grazing validation meetings and field monitoring meetings rather than utilizing the more formal process.

In late June 2004, a request for comments package (PR#79) was sent to the 8 scoping respondents, the 4 affected permit holders, and potentially interested Native American Tribes. Ten comment letters were received (PR#s 83 through 92). The ID Team reviewed and considered the comments in early August 2004 (PR# 93). Comments were used to complete Chapter 3 of the EA (PR#98).

As the result of having subsequent decisions reversed by the Forest Supervisor a second comment period was conducted in March 2005. The comment package (PR#111) was sent to 15 interested parties and agencies including the 4 affected permit holders. Addendum letters informing the potentially interested Tribes of the changes made to the original June 2004 comment package were also sent (PR#112). Five comment letters were received (PR#s 120 through 124). The Acting District Ranger, Acting Forest Range - Soil/Water - Ecology Team Leader, Forest NEPA Coordinator, and the project ID Team Leader reviewed and considered the comments in early May 2005. Comments were used to complete Chapter 3 and make editing changes to the other parts of the assessment (PR#125).

Public Issues: (PR# 61)

Public issues were determined by comparing all comments to the definition of an issue: *An expression of a dispute, debate, or discussion regarding the Proposed Action based upon some anticipated environmental effect.*

Three public issues significant to the analysis were identified:

- 1) The proposed utilization levels would result in long-term degradation of resources.

Note: Utilization was used in the scoping document in an inappropriate context on the Copper Canyon and Bald Hill Allotments where rotation grazing is practiced. Allowable use is the correct term. Utilization is, however, appropriate for Squaw Peak and Young Allotments

Definitions of the two terms are:

Utilization (*syn. Use*) – *The proportion (usually expressed as a percent) of the total current year's forage production that is consumed or destroyed by grazing animals (Glossary of Terms used in Range Management, SRM 1998). Utilization is measured at the end of the current year's growing season and is a measure of total use.*

Allowable use (relative use, seasonal use) – *the degree of use considered desirable and attainable considering the present resource condition, management objectives, and management level (USDA Forest Service R3 1997). Allowable use allows you to gauge use in a pasture and rotate between pastures prior to the removal of all the growth during a growing season. Additional growth is allowed to take place prior to any re-entry.*

- 2) Riparian area protection is not adequate and would result in loss of important habitat.
- 3) Controlling livestock access to water to defer areas from grazing on the Squaw Peak Allotment will not be successful, resulting in overuse of resources.

Although some confusion resulted from the unintended use of the term utilization, the ID Team still considered Item 1 above to be a public issue that was significant to the analysis process and therefore was used to determine alternatives to the proposed action.

Issues not significant to the analysis are those that are:

- Outside the scope of the Proposed Action
- Already decided by law, regulation, Forest Plan or higher level decision
- Irrelevant to the decision to be made
- Conjectural and not supported by scientific fact

No non-significant public issues were identified from public scoping.

CHAPTER 2 - ALTERNATIVES INCLUDING THE PROPOSED ACTION

Development of Alternatives

Monitoring of resource conditions throughout the project area coupled with input from affected permit holders helped define the size and dimension of the analysis and resulted in a proposed action. The Proposed Action (now contained in Alternative 3) was finalized and scoped with both the affected permit holders and the public in January 2002 (PR# 32).

Following this scoping effort, three public issues were identified (PR# 61) concerning the proposed allowable use/utilization levels, riparian area use, and controlling livestock water access to defer areas from grazing (Squaw Peak Allotment only).

In response to these issues and public scoping input, two alternatives to the Proposed Action were developed: One incorporated a reduced allowable use/utilization level, additional riparian fencing on Bald Hill Allotment and waterlot construction around troughs and pipeline overflow area on Squaw Peak Allotment. The second used a seasonal grazing strategy with the same riparian fencing and waterlot construction as the first.

In 2003, the effects of the prolonged draught began to manifest itself through out the Forest. On the Verde Rim allotments desirable plants on all aspects began to show signs of drought stress and experience mortality. In response to this and similar forest-wide effects, a stocking/use strategy was developed to help adjust livestock management (PR#127) within the confines of the livestock grazing permit. In keeping with this strategy stocking on the Verde Rim allotments was approximately 40% the permitted numbers in 2002 to the present.

In February 2004, a change in Forest Service direction encouraged consideration of an adaptive management strategy for livestock grazing (USDA Forest Service 2004a). This change led to the creation of a Modified Proposed Action that incorporated many of the elements of the earlier

alternatives and the decision to not carry the Seasonal Grazing Alternative forward for detailed analysis.

Description of Alternatives

Five alternatives were considered in detail including the original Proposed Action. The following describes the design of the alternatives. Mitigation measures and monitoring needs follow the alternative descriptions. Alternative maps are located in Appendix 4.

Alternatives 3 (Proposed Action), 4 (Modified Proposed Action), and 5 (Reduced Utilization) incorporate management flexibility by providing for annually authorizing stocking based on monitored resource conditions. Actual stocking would then be designated in the Annual Operating Instructions (AOI) and authorized in the Bill for Collection and may be less than permitted numbers on a year by year basis. Adjustments may be made as weather dictates or if resources are affected by natural conditions, such as drought, [Term Grazing Permit, Part 2. *General Terms and Conditions* - 8(b)].

Alternatives 3 (Proposed Action), 4 (Modified Proposed Action), and 5 (Reduced Utilization) propose both structural and non-structural range improvements which would become a part of any new permit issued. The US Forest Service financial contribution to these proposed improvements and restoration is not yet determined. Any US Forest Service contributions would be defined by multi-year range program priorities across the Prescott National Forest, and would be based on resource need and other opportunities for funding such as grants from organizations and other agencies.

Adaptive management includes adjustments to management as resource conditions fluctuate. Adaptive management includes:

- Changing timing, such as entering a pasture later in the season or resting a pasture.
- Changing intensity by adjusting stocking levels or utilization levels
- Changing duration by adjusting distribution or resting a pasture.
- Constructing drift fences in Copper Canyon to control access to Desert Shrub formation (TES 368) in the drainage and to control movement between the north and south end of the pasture, if needed to achieve resource and/or Southwestern Willow Flycatcher buffer zone mitigation objectives.
- Constructing a cross fence in Lucky pasture to create north and south units to control livestock access to TES 368, if needed to achieve resource objectives.
- Constructing additional fencing in the Copper Canyon drainage to protect known riparian areas if a winter use only management strategy is ineffective.
- Constructing additional fencing of areas having riparian potential but not currently showing riparian vegetation or in identified riparian areas not currently grazed on the Bald Hill and Copper Canyon Allotments, if needed to achieve resource objectives.

- Thinning as much as 100 acres of juniper in the watershed immediately above Squaw Peak Tank to reduce sediment flow into the tank and increase available water storage, if livestock can not be held long enough in the higher elevation grazing area to achieve deferment in the lower grazing areas.

At the end of this chapter, the alternatives are presented in comparative form (Table 2.6) to show how they address the purpose and need, significant public issues, relevant Forest Plan direction, and other key environmental effects. The implementation process for adaptive management is discussed in the monitoring section (pages 2-7, 2-8).

Alternative 1: No Action (No Livestock Grazing)

This alternative is responsive to Forest Service policy (USDA Forest Service 2004b) implementing the National Environmental Policy Act that requires analysis of a “no action” alternative.

Table 2.1 – No Action (No Livestock Grazing)

Management Parameter	Allotment			
	<i>Bald Hill</i>	<i>Copper Canyon</i>	<i>Squaw Peak</i>	<i>Young</i>
<i>Permitted Stocking (animal Months)</i>	None – existing permits cancelled and not re-issued			
<i>Season of Use</i>	No livestock use			
<i>Number of Pastures / Grazing System</i>	None			
<i>Forage and Browse Utilization</i>	None – No livestock grazing			
<i>Riparian Area use</i>	None – No livestock grazing			
<i>Range Structural Improvements</i>	Interior fences would be removed or gaps created. Maintenance responsibility for interior allotment boundary fences would be transferred to adjacent permit holder. The Forest Service would accept maintenance responsibility for retained water developments.			

Alternative 2: Current Management

This alternative is the continuation of current management on each of the four allotments comprising the project. The current management strategies are described below.

Table 2.2 – Current Management

Management Parameter	Allotment			
	<i>Bald Hill</i>	<i>Copper Canyon</i>	<i>Squaw Peak</i>	<i>Young</i>

Permitted Stocking (animal Months)	2064	960 - 1200	Up to 1080	Up to 108
Season of Use	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31
Number of Pastures / Grazing System	4 (+2 small intermittently used) / Deferred (Arnold Pasture winter-use)	4 (+2 small holding) / deferred (Tompkins Pasture winter-use)	Allotment as a whole – 3 grazing areas / deferment of areas by herding	Allotment as a whole / Deferred from grazing the same growing season more than 2 years in a row
Allowable use (indicator for pasture moves)	40%	40%	Allotment is managed as a whole – no pastures	Allotment is managed as a whole – no pastures.
Forage Utilization (end of growing season)	50%	50%	50%	40%
Browse Utilization	50% current year’s production on available leaders	50% current year’s production on available leaders	50% current year’s production on available leaders	No browse available
Riparian Area Use	20% current year’s growth	20% current year’s growth	20% current year’s growth	No riparian areas
Range Structural Improvements and Vegetation Treatments	None	None	None	None

Alternative 3: Proposed Action

This alternative is the publicly scoped action and is designed to:

- Provide for some adaptive management
- Include juniper treatments for watershed improvement
- Improve riparian area protection with additional fencing

Presentation of this alternative has been altered to conform to that of the other alternatives so comparisons can be made. See Project Record (PR#32) to view the alternative as presented for public scoping.

Table 2.3 – Proposed Action

Management Parameter	Allotment			
	<i>Bald Hill</i>	<i>Copper Canyon</i>	<i>Squaw Peak</i>	<i>Young</i>
Permitted Stocking (animal Months)	1560 - 2064	960 - 1200	Up to 720	Up to 108
Season of Use	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31
Number of Pastures / Grazing System	4 (+2 small intermittently used) / Deferred (Arnold Pasture winter-use)	4 (+2 small holding) / deferred (Tompkins Pasture winter-use)	Allotment as a whole – 3 grazing areas / deferment of areas by control of water access	Allotment as a whole / Deferred from grazing the same growing season more than 2 years in a row

Allowable use (indicator for pasture moves)	40%	40%	30% - Allotment would be managed with 3 grazing areas.	Allotment would be managed as a whole – no pastures.
Forage Utilization (end of growing season)	50%	50%	50%	40%
Browse Utilization	50% current year's production on available leaders	50% current year's production on available leaders	50% current year's production on available leaders	No browse available
Riparian Area Use	20% current year's growth	20% current year's growth	20% current year's growth	No riparian areas
Range Structural Improvements and Vegetation Treatments	Extend riparian enclosure on Cienega Creek, and at Remer Spring; Conduct 2560 acres of juniper removal for watershed improvement; ¾ mile of fence	No new range structures; Conduct 147 acres of juniper control for watershed improvement; Conduct 909 acres of prescribed burning to enhance VGC	No new range structures; Conduct 1061 acres of juniper control for watershed improvement	None

Alternative 4 – Modified Proposed Action

This alternative is the publicly scoped action modified to:

- Provide for adaptive management
- Remove juniper treatments since these treatments were not intended to improve grazing management, which is the scope of this project.
- Be responsive to the public issues dealing with riparian area protection and deferment of grazing areas through additional fencing

This alternative also adjusts allowable use or utilization in areas where an increase in grass cover and/or composition may require a change in grazing effects.

Table 2.4 – Modified Proposed Action

Management Parameter	Allotment			
	<i>Bald Hill</i>	<i>Copper Canyon</i>	<i>Squaw Peak</i>	<i>Young</i>
<i>Permitted Stocking (animal Months)</i>	1495 - 2064	840 - 1200	540 - 720	Up to 108
<i>Season of Use</i>	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31
<i>Number of Pastures / Grazing System</i>	4 (+2 small intermittently used) / Deferred (Arnold)	4 (+2 small holding) / deferred (Tompkins Pasture)	Allotment as a whole – 3 grazing areas / deferment of	Allotment as a whole / Deferred from grazing the

	Pasture winter-use)	winter-use)	areas by control of access to water and herding	same growing season more than 2 years in a row
Allowable use (indicator for pasture moves)	40% (30% in Bates and Bull Pastures)	40% (30% in Cottonwood Pasture)	25% - Allotment would be managed with 3 grazing areas.	Allotment would be managed as a whole – no pastures.
Forage Utilization (end of growing season)	50% (30% in Bates and Bull Pastures)	50% (30% in Cottonwood Pasture)	25%	40%
Browse Utilization	50% current year's production on available leaders	50% current year's production on available leaders	40% current year's production on available leaders	No browse available
Riparian Area Use	Riparian areas fenced	20% current year's growth	No riparian areas grazed	No riparian areas
Range Structural Improvements and Vegetation Treatments	Extend riparian enclosure on Cienega Creek, and at Remer Spring; Construct riparian enclosures adjacent to the private land on Cienega Creek and along Arnold Canyon; ¾ mile of fence; No vegetation treatments	No new range structures; Conduct 550 acres of prescribed burning to enhance VGC	Construct waterlots at ends of North and Lower Mine Spring pipelines; No Vegetation treatments	None

Alternative 5: Reduced Utilization

This alternative is designed to:

- Be responsive to public issues dealing with utilization (and allowable use), riparian area protection, and deferment of grazing through additional fencing
- Provide for adaptive management

Table 2.5 – Reduced Utilization

Management Parameter	Allotment			
	<i>Bald Hill</i>	<i>Copper Canyon</i>	<i>Squaw Peak</i>	<i>Young</i>
Permitted Stocking (animal Months)	1170- 1548	720 - 900	540 - 720	Up to 108
Season of Use	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31
Number of Pastures / Grazing System	4 (+2 small intermittently used) / Deferred (Arnold Pasture winter-use)	4 (+2 small holding) / deferred (Tompkins Pasture winter-use)	Allotment as a whole – 3 grazing areas / deferment of areas by control of access to water and herding	Allotment as a whole / Deferred from grazing the same growing season more than 2 years in a row
Allowable use	30%	30%	25% - Allotment	Allotment would be

<i>(indicator for pasture moves)</i>			would be managed with 3 grazing areas.	managed as a whole – no pastures.
Forage Utilization (end of growing season)	30%	30%	25%	30%
Browse Utilization	30% current year's production on available leaders	30% current year's production on available leaders	25% current year's production on available leaders	No browse available
Riparian Area Use	Riparian areas fenced	20% current year's growth	No riparian areas grazed	No riparian areas
Range Structural Improvements and Vegetation Treatments	Extend riparian enclosure on Cienega Creek, and at Remer Spring; Construct riparian enclosures adjacent to the private land on Cienega Creek and along Arnold Canyon; ¾ mile of fence; No vegetation treatments	No new range structures; Conduct 550 acres of prescribed burning to enhance VGC	Construct waterlots at ends of North and Lower Mine Spring pipelines; No Vegetation treatments	None

Mitigation Measures

These mitigation measures are incorporated into Alternatives 3, 4 and 5.

Soil and Water

The object is to mitigate soil and water impacts from livestock grazing. Best Management Practices for soil and water protection would apply to the Proposed Action and would be incorporated into the allotment management plans (See Appendix 1 – BMPs). Practices include but are not limited to:

- *Preparation of an annual operating procedure with the permittee to allow for consideration of current allotment conditions and management objectives.*
- *Periodic field checks to identify needed adjustments in season of use and livestock numbers, forage utilization, assessment of rangeland to verify soil function, vegetation health and trend.*
- *Application of standard practices such as salting, herding, and controlling access to water to achieve proper distribution or lessen the impact on areas which are sensitive or are natural concentration areas*
- *Grazing pastures with riparian ecosystems primarily during plant dormancy periods or constructing/maintaining riparian enclosure fencing.*

Wildlife/Rare Plants

Wildlife/Rare Plants mitigation measures are important to maintain wildlife habitat and population needs. Relevant mitigation measures include the following:

- No troughs or mineral supplements would be placed within ¼ mile of any identified sensitive plant population and no new improvements (e.g. pipelines, tanks, or fences) would go through any such population.
- All new or reconstructed fencing would be built to accommodate wildlife passage using a 4-strand fence with a smooth bottom wire 16 inches off the ground and a total fence height of 42 inches or less.
- All new or reconstructed water developments would include wildlife access and escape ramps.
- Livestock use in Copper Canyon Pasture (Copper Canyon Allotment) and the Young Allotment would be restricted during an April 1 – July 31 time period each year to provide a cowbird buffer zone for the Southwestern Willow Flycatcher.
- Cooperate with permittees to make stock water supplies available for wildlife needs during critical periods, if water is available at the sources (e.g. storage tank) and livestock rotations would not be disrupted.

Monitoring

Implementation of Adaptive Grazing Management

Monitoring would be used to determine current resource status and to ensure the allotment management plan and other terms of the permit are being followed. Monitoring would also be used to determine whether the actions are effective in achieving or moving toward desired conditions.

Short-term monitoring would be conducted using tools such as the Rangeland Health Checklist which documents utilization levels and short-term indicators of rangeland health in key areas. This checklist would be used to determine if adjustments in stocking, duration of grazing, or the season of use are needed. Utilization monitoring would be consistent with methods in the Interagency Technical Reference - Utilization Studies and Residual Measurements (USDI 1996).

If short term monitoring indicate concerns that movement towards desired conditions is not likely, annual changes in management may be made. Changes in management can include modifying annual authorized livestock numbers, duration season of use, class of animal, or other modifications within the outer limits of the timing, intensity, duration, and frequency defined for the proposed action. Rangeland Health Checklists will be used with short term monitoring.

Long-term monitoring tracks whether the actions are effective in achieving or moving toward desired project objectives, i.e. plant diversity, soil function, and riparian vegetation potential. Monitoring would be consistent with methods in the Interagency Technical Reference - Sampling Vegetation Attributes (USDI 1996), Proper Functioning Condition (USDI 1998), Soil Condition field evaluation form and Forest Service Handbooks.

If long-term monitoring indicates that desired conditions are not being achieved, changes in management would be implemented. Changes may include lowering allowable grazing intensity for that unit, increasing rest from grazing or reducing permitted numbers. Long term monitoring results combined with actual use would be used to validate and refine term permitted numbers.

Other Alternatives

Alternative Considered but Eliminated from Detailed Study.

One alternative was considered and dismissed from detailed consideration:

Seasonal Grazing – This alternative proposed by a scoping responder would reduce the current year-round grazing to a September through March season each year for all allotments in the project and would restrict entry into any pasture until such time as the key forage species have re-grown to pre-entry height.

While this alternative addresses resource concerns, it is not feasible to implement due to the lack of management flexibility and adverse economics.

- The defined season lacks management flexibility to adjust operations to meet resource needs.
- The permittees involved do not have a sufficient private land base to which they could move permitted cattle numbers from the Forest for the prescribed 5 months.
- The steer market is so highly volatile that without access to feedlots, the strict off dates would make it impossible to adjust selling at reasonable prices.

Comparison of Alternatives

The following table compares alternatives with respect to the purpose and need, significant public issues, Forest Plan guidance, and other key environmental effects for the alternatives developed in detail.

Table 2.6 – Comparison of Alternatives

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Purpose and Need					
-Authorize Grazing	No livestock grazing – existing permits cancelled.	Yes – Current permit grazing parameters continue.	Yes – New permits issued with reduced utilization on Squaw Peak and additional fencing on Bald Hill.	Yes – New Permits issued with reduced utilization levels on Squaw Peak and pastures on Copper Canyon and Bald Hill and additional fencing on both Squaw Peak and Bald Hill.	Yes – New permits issued with reduced allowable use levels, and additional fencing on both Squaw Peak and Bald Hill.
-Increase or maintain VGC, perennial grass composition and cover: Pinyon/Juniper Communities	Greatest rate of improvement to VGC. Grass composition would gradually improve to attainable potential where woody cover is not limiting.	VGC and composition would remain below attainable potential on approximately 11% of ecotype* impacted by dense juniper cover. Approximately 25% of ecotype would continue to have less VGC than attainable potential but may have improved composition by grasses on areas not impacted by high juniper cover.	VGC and grass composition would be improved by juniper thinning on about 14% of ecotype*. Improvement would be limited because grazing intensity would only decrease slightly over Alternative 2. On the untreated sites VGC and grass composition would move towards attainable potential on approximately 4% of ecotype* due to reduced stocking.	Reduced allowable use would move VGC and grass composition towards attainable potential on 8% of ecotype* but other areas would continue to limit VGC and grass composition.	Lower allowable use on portions of approximately 36% of ecotype* would improve VGC, grass composition and move conditions towards attainable potential where high juniper cover is not limiting production.

- Portions of this map unit are not expected to change due to factors outside the scope of this assessment including canopy cover and activities other than livestock grazing.

Table 2.6 – comparison of Alternatives (Cont)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Purpose and Need (Cont)					
-Desert shrub/ Grassland Community	Greatest rate of improvement to VGC and grass composition where inherent ecosystem characteristics are not limiting. Similar to Alternative 4 and 5 but at a faster rate of improvement. However, this alternative does not call for prescribed fire, and VGC and grass composition would continue to decline on 550 acres.	VGC and grass composition would remain static and areas below attainable potential would remain the same	VGC and grass composition would improve on prescribed fire areas but would be limited because grazing intensity would only decrease slightly. The remainder of the untreated sites VGC and grass composition would remain similar to Alternative 2 with a slight improvement.	Similar prescriptions as Alternative 3 with a further reduction in grazing intensity which would improve VGC and grass composition over Alternative 3.	Similar prescriptions as Alternative 4 with a slightly lower reduction in grazing intensity which would improve VGC and grass composition over Alternative 4.
-Chaparral Community	VGC and grass composition where inherent ecosystem characteristics are not limiting would improve gradually to attainable potential.	VGC and grass composition would remain static on 17% of ecotype* on Squaw Peak. Remainder would not change. Soil conditions would remain variable and degraded areas would continue to degrade.	VGC and grass diversity would improve on 17% of ecotype*. Remainder would not change.	Similar to Alternative 1 but at a slower rate.	Same as Alternative 4

* Portions of this map unit are not expected to change due to factors outside the scope of this assessment including canopy cover and activities other than livestock grazing.

Table 2.6 – Comparison of Alternatives (cont)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Purpose and Need (cont)					
- Improve soil function to enhance soil conditions	Overall, soil condition would improve at the greatest rate.	Soil conditions would remain variable and degraded areas would continue to degrade	Soil Conditions would have the greatest improvement on the grassland prescribed fire sites and the juniper treatment areas. However, potential improvement would be limited because livestock grazing would decrease only slightly over Alternative 2. The remainder of the untreated soils would remain similar to Alternative 2 with a slight improvement	The reduced allowable use on all ecosystems and the reduction of desert shrub canopy on 550 acres would improve overall soil conditions.	Same prescriptions as identified in Alternative 4 with a further reduction in grazing intensity would result in a minimal to moderate improvement of soil conditions over Alternative 4.
-Allow riparian vegetation to reach or move toward potential	Responded to below under Significant Public Issues and Forest Plan Compliance				
-Allow channel profiles to return to appropriate dimensions for site morphology and channel function	Excluding cattle would lead to gradual return of channel profile and function throughout analysis area.	Channel conditions direction would continue. Degraded areas would contribute to a decline of channel function.	Reduction of juniper and desert shrub canopy would reduce runoff and sediment movement from uplands. Riparian fencing and changes to winter use would lead to reduced grazing impacts.	Riparian fencing beyond that in Alt 3 and changes to winter grazing in some areas would lead to a gradual return of channel profile and function in affected sections. No decrease in upland sediment and water transport.	Same as Alternative 4

Table 2.6 – Comparison of Alternatives (cont)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Significant Public Issues					
-Proposed Utilization / allowable use levels would result in long- term decline of resources	Forage plants would grow without being grazed by livestock. Decline of resources attributed to grazing would cease.	Approximately 14% of project area would remain below levels predicted by TES for VGC and species richness. 28% of project area* is deficient in VGC and/or species richness. Current allowable use/management would continue current trends	Resource conditions are stable but some areas are below potential with limited buffering from decline. Lower stocking would reduce, but not eliminate, the area impacted by grazing.	Resource conditions would remain stable but some areas are below potential with limited buffering from decline. Lower allowable use would reduce, but not eliminate, the areas impacted by grazing	Allowable use levels would sustain or improve long-term resource conditions. Some areas would remain below attainable potential.
- Riparian area protection is not adequate and would result in loss of important habitat	Riparian areas would no longer be affected by livestock and riparian habitat would improve.	Riparian vegetation and habitat quality would continue to be impacted by grazing. Riparian would not develop to potential in these areas.	Fencing or winter season grazing would improve riparian habitat.	Additional fencing would lead to a greater extent of riparian habitat improvement than Alternative 3.	Same as Alternative 4.
-The use of water access to defer areas on Squaw Peak will not be successful	Not applicable	There would be periods when there is insufficient water to defer grazing at current stocking.	Similar to Alternative 2	Lower stocking and waterlot construction would greatly improve deferred grazing.	Same as Alternative 4

Table 2.6 – Comparison of Alternatives (cont)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Forest Plan Compliance					
<i>Forest – wide:</i>					
-Provide forage for grazing and browsing animals to the extent benefits are relatively commensurate with costs without impairing land productivity. <i>(Pg. 12 of LMP -2004 republished version)</i>	Forage would not be provided for livestock. There would be no risk of impairing land productivity through grazing management.	Forage is provided for livestock. Current trends in productivity related to livestock impacts would continue.	Forage is provided for livestock. Current trends in productivity related to livestock impacts would continue.	Forage is provided for livestock. Reduced allowable use in impacted areas and adaptive management provide tools to improve areas adversely affected by grazing.	Same as alternative 4 with some additional improvement in impacted areas where allowable use is not reduced
-Maintain and/or improve habitat for T&E species and work toward recovery <i>(Pg. 13 of LMP - 2004 republished version)</i>	There is no occupied or potential habitat in the project area for any T&E species and therefore not applicable to this analysis.	.			
-Improve all riparian areas and maintain in satisfactory condition <i>(Pg. 14 of LMP – 2004 republished version)</i>	Riparian areas impacted by livestock would improve	Riparian areas within enclosures would continue to improve. Livestock impacts outside enclosures would continue to degrade riparian areas.	Functional at risk locations are to be fenced or would have winter use only resulting in riparian improvement.	Livestock grazing impacts would be reduced to a greater extent than Alternative 3 as there is additional fencing of riparian habitats.	Same as Alternative 4

Table 2.6 – Comparison of Alternatives (cont)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Forest Plan Compliance (Cont)					
<i>Relevant Management Area (MA)</i>					
MA 2 – Woodland:					
-High chaparral and Pinyon/juniper = Management seeks uniform livestock distribution and use of forage allocated to livestock (pgs 56, 125 of LMP-2004 republished version)	There would be no livestock grazing, therefore there would not be any livestock management needs.	Distribution is affected by steep slopes, dense overstory woodland vegetation, causing cattle concentrations around water sites and on gentler slopes	Riparian area fencing with off site water, water site fencing, juniper overstory removal, and some pasture entry changes to winter use will benefit distribution and allow for more even use of available forage.	Same as Alternative 3 except there would not be as great an opportunity for wider distribution since juniper overstory is not reduced	Same as Alternative 4
MA 5 – Desert Grassland:					
Low chaparral, desert shrub, grassland = Management seeks to realize maximum livestock production and utilization of forage allocated to livestock (pg 64-65, 125 of LMP – 2004 republished version)	There would be no livestock grazing, therefore there would not be any livestock management needs.	Historically these areas have been highly utilized by livestock causing some decreases in grass diversity and soil conditions associated with increases in shrub cover. Current management would tend to maintain the existing conditions.	With combinations of reduced stocking, area grazed, and prescribed burning vegetative conditions are expected to improve and proposed permitted numbers to be maintained.	Same as Alternative 3	Same as Alternative 3

Table 2.6 – Summary of Effects (continued)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Forest Plan Compliance (Cont)					
MA 6 - Wilderness					
All vegetation types = Manage livestock grazing to ensure that the maintenance of wilderness character and values are not diminished (pg 68 of LMP-2004 republished version)	No livestock grazing, therefore there would be no livestock impacts to wilderness values	Livestock grazing is limited due to steep slopes and the lack of reliable water. Light use on vegetation and highly dispersed livestock would not detract from the wilderness character nor diminish its value	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
MA 7 – Recreation:					
Verde Scenic River (Beasley Flat day-use/river access area) = No grazing capacity to be assigned (Pg 70 of LMP – 2004 republished version)	No livestock grazing. Entire area is fenced	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1

Table 2.6 – Summary of Effects (continued)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Other Key Environmental Effects					
Watershed Health	With cattle removal, watershed health would slightly improve in areas where woody cover is not a concern.	Watershed conditions would remain unchanged. Degraded areas would limit improvement of watershed health	Reduction of juniper and desert shrub canopy would reduce runoff and sediment movement from treated acres. Watershed health would improve in treated areas greater than for Alternatives 1 and 2	Watershed health would move towards stabilization.	Watershed health would improve similar to Alternative 1, but at a slower rate of improvement.
Wildlife and Rare Plants: T,E & S Species:	With no livestock grazing, riparian and desert shrub habitats would be maintained and/or improved and may increase local populations of Lowland leopard frog, Arizona toad, Mearns sage, Hualapai milkwort	There is no occupied or potential habitat in the project area for any T&E species. Continued livestock grazing impacts to some riparian and desert shrub habitats may limit local populations of Lowland leopard frog, Arizona toad, Mearns sage, Hualapai milkwort	There is no occupied or potential habitat in the project area for any T&E species. Fencing would improve riparian habitats and may increase local populations of Lowland leopard frog, Arizona toad. Improved distribution and control of grazing in desert shrub habitats would maintain local populations of Mearns sage and Hualapai milkwort	There is no occupied or potential habitat in the project area for any T&E species. Fencing would occur in more locations than Alternative 3, improving more riparian habitats and may increase local populations of Lowland leopard frog, Arizona toad. Same as Alternative 3 for Mearns sage and Hualapai milkwort populations	Same as Alternative 4

Table 2.6 – Summary of Effects (continued)

	Alternative 1 No Action (No Livestock Grazing)	Alternative 2 Current Management	Alternative 3 Proposed Action	Alternative 4 Modified Proposed Action	Alternative 5 Reduced Utilization
Other Key Environmental Effects (cont)					
MIS	With no livestock grazing, riparian habitats would be maintained and/or improved and may increase local populations of Lucy’s warbler. There would be no change in seral stages of habitat for mule deer and juniper titmouse and therefore no change in populations.	Continued livestock grazing impacts to some riparian habitats may limit local populations of Lucy’s warbler. There would be no change in habitat for mule deer or juniper titmouse and thus no change in populations.	Juniper thinning would alter seral stage of PJ habitats, may increase local population of mule deer because of increased forage production; may decrease local population of juniper titmouse because of loss of mature trees for nesting. Continued livestock grazing impacts to some riparian habitats may limit local populations of Lucy’s warbler.	Seral stage of PJ habitat would be maintained. No change to mule deer or juniper titmouse populations. Riparian habitats would be maintained and/or improved thru fencing or winter use and may increase local populations of Lucy’s warbler.	Same as Alternative 4
Migratory Birds	With no livestock grazing, riparian habitats would be maintained and/or improved and may increase local populations of Lucy’s warbler and reduce Southwestern willow flycatcher (SWWF) brood parasitism from brown-headed cowbirds (BHC).	Continued livestock grazing impacts to some riparian habitats may limit local populations of Lucy’s warbler and contribute to potential BHC parasitism of SWWF brood.	Fencing would improve riparian habitats and may increase local populations of Lucy’s warbler and maintenance of a 2-mile buffer zone during SWWF nesting would reduce potential parasitism to negligible levels.	Fencing would occur in more locations than Alternative 3, improving riparian habitats and may increase local populations of Lucy’s warbler and maintenance of a 2-mile buffer zone during SWWF nesting would reduce potential parasitism to negligible levels.	Same as Alternative 4

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

This Chapter describes the present condition within the project area, how each alternative addresses the issues raised during scoping and the environmental effects of each alternative.

RESPONSES TO THE SIGNIFICANT ISSUES

The significant issues identified during scoping (Chapter 1) are:

1. *The concern that the proposed utilization levels of 40 to 50% are too high and will eventually lead to resource degradation.*
2. *The concern that riparian area protection is not adequate and would result in loss of important habitat.*
3. *The concern that controlling livestock access to water to defer areas from grazing on the Squaw Peak Allotment will not be successful, resulting in overuse of resources.*

Issue 1 – Proposed utilization levels are too high:

Alternative 1 – No Action (No grazing):

Under this alternative there would be no livestock grazing, so utilization by livestock would be zero. Forage plants would grow without being grazed by livestock. Any decline of resources attributed to livestock would cease. However, any decline/increase due to natural processes (e.g. drought) would continue.

Alternative 2 – Current Management:

Under this alternative the current allowable use/utilization levels of 30% - 40% growing season and 50% non-growing season would remain. Approximately 14% of the project area would remain below levels predicted by Terrestrial Ecosystem Survey for vegetative ground cover. Cover and species richness and current trends in the rest of the area would remain static.

Alternative 3 – Proposed Action:

Under this alternative the allowable use/utilization levels would be the same as current management. Effects would be similar to Alternative 2 but there would be better distribution of use because of the proposed management actions. As with Alternative 2, with continued drought, there would be continued decline due to natural processes.

Alternative 4 – Modified Proposed Action:

Under this alternative allowable use/utilization would generally be maintained at the moderate level (40%) for three of the four allotments. There would be reduced allowable use/utilization in the two small pastures of Bald Hill and all of Squaw Peak. This alternative would be more likely to improve the vegetation and soil resources under favorable climatic conditions and possibly maintain these resources in droughts.

Alternative 5 – Reduced Utilization:

Under this alternative allowable use/utilization levels would be reduced to 25% -30%. Lower allowable use/utilization levels would sustain or improve long term resource conditions.

ISSUE 2 – Riparian Area protection is not adequate:**Alternative 1 – No Action**

Under this alternative there would be no livestock grazing so utilization by livestock would be zero. Forage plants would grow without being grazed by livestock. Any decline of resources attributed to livestock would cease.

Alternative 2 – Current Management

Under this alternative riparian vegetation and habitat quality would continue to be impacted by grazing. Areas with riparian potential not currently excluded from livestock grazing would not develop to their potential.

Alternative 3 – Proposed Action

Under this alternative increased fencing and implementation of winter-use only pastures would improve potential and existing riparian. Some areas where livestock use would continue but be controlled by management would improve but still would remain below potential.

Alternative 4 – Modified Proposed Action

Under this alternative all areas on the Bald Hill Allotment currently exhibiting riparian potential would be fenced and a winter grazing only pasture in Copper Canyon Allotment would be used. This would allow all riparian areas potentially impacted by livestock grazing to develop to potential.

Alternative 5 – Reduced Utilization

This alternative is the same as Alternative 4 in regards to this issue since the proposed riparian fencing and winter grazing are the same for both alternatives.

ISSUE 3 – Controlling water access on Squaw Peak Allotment**Alternative 1 – No Action**

Under this alternative there is no livestock grazing so the issue is moot.

Alternative 2 – Current Management

Under this alternative current management would continue to be unable to fully control distribution of use and overuse in some areas would continue.

Alternative 3 – Proposed Action

Under this alternative livestock use of water through control of water flow would be used in conjunction with herding. While this would be expected to achieve desired distribution and deferment, herding would need to be diligently managed.

Alternative 4 – Modified Proposed Action

Under this alternative waterlots are proposed to be constructed around water sources. This would alleviate the uncertainties associated with herding alone and would ensure livestock movement and deferment of areas.

Alternative 5 – Reduced Utilization

This alternative utilizes the same strategies as Alternative 4, producing the same effects.

Additional information associated with these issues is contained in the following section.

AFFECTED ENVIRONMENT and EFFECTS RELATIVE TO KEY RESOURCES

Effects of the alternatives are discussed in this section for the following resource areas:

- Soils, Vegetation, and Riparian Resources
- Watershed Condition
- Wildlife and Rare Plants
- Air Resources
- Wilderness Resources
- Verde Wild and Scenic River
- Heritage Resources

This section also includes other findings concerning public health and safety, prime farm lands, range structures, economics, and environmental justice.

No changes are proposed to any roads within the project area and no new roads are proposed under any of the alternatives. Therefore, a roads analysis was not needed.

The effects of grazing were determined by analysis of existing ecological condition plot data collected for the Terrestrial Ecosystem Survey (TES) and for the Ecological Classification of the Prescott National Forest, field data collected during range inspections which also identified livestock utilization patterns, evaluated soil quality indicators, channel and riparian condition (watershed condition) information on the allotments (PR#117). Water quality information from the Arizona Department of Environmental Quality was used to determine if water quality impairment was occurring in the watersheds where the allotments are located (PR#106).

SOILS, VEGETATION AND RIPARIAN RESOURCES

There are four unique vegetative formations in the project area (PR#s104, 114, 117); the effects analysis is organized by these formations:

- pinyon/juniper
- desert shrub/grassland
- chaparral
- riparian

Within each vegetative formation there are factors (such as soil parent material, soil depth, climatic regime, slope, and plant community) that have been identified as creating a unique Terrestrial Ecosystem Survey map unit. The TES map units are the foundation blocks of the environmental effects analysis. Data on each map unit was examined to determine the effects of livestock grazing on plants and soils. Most map units occur in multiple locations in the analysis area and each unique occurrence is called a polygon (Appendix 5).

Drought is currently affecting vegetation and available water. Vegetation responses to dry weather include die off of short lived perennial grasses and stress to other grasses as well as the loss of ponderosa and pinyon pine and, to a lesser extent, juniper. Within this analysis area there has been mortality to curly mesquite, aristedas, juniper and pinyon pine and other species exhibit stress or indications of mortality. Distribution of drought effects is not uniform but is more obvious on some TES map units (Existing Condition PR#117). While drought and weather cycles are factors that could reset the ecological baselines for resources, adaptive management can respond to short term fluctuations in resource conditions. Re-analysis may be needed if conditions change significantly from those predicted in this analysis.

Pinyon/Juniper Woodlands

The pinyon/juniper woodlands are the largest vegetative formation of the analysis area covering 27,145 acres (77% of total project area). This formation has a large variation in tree/shrub canopy cover, often within the same map unit.

Affected Environment

These woodlands occur throughout the analysis area. Through a combination of factors (including grazing, reduced fire, and climate) the community has expanded in range and individual stands have increased in woody canopy density. As a direct result of this expansion and increasing woody (tree/shrub) canopy density, the understory herbaceous species have, in turn, decreased in diversity and cover.

Approximately three quarters of the pinyon/juniper woodlands are on moderate slopes (15-40%) and half of these acres have higher shrub or tree cover than predicted at potential. Grass cover varies widely from similar to potential to up to two times less. Since improvement may be limited by tree and shrub canopy cover, changes in or removal of livestock management alone would not be sufficient to restore the species composition and diversity described by TES.

Slightly more than 15% of these woodlands are on gentle slopes (0 to 15%) with, generally, less grass cover and similar to slightly higher shrub and tree cover than predicted at potential. These areas are easily accessed by livestock and influenced by the effects of grazing management.

Slightly more than 10% of these woodlands are on relatively steep slopes (40 to 120%). These areas receive limited grazing. Inspections and plots found no measurable grazing related effects and the units are similar to TES potential.

Soils:

Soil conditions vary greatly and are predominantly associated with the variable juniper densities. Soils generally are shallow to deep, and have a slight to moderate erosion hazard rating. The soil

surface texture is predominantly fine with some coarse textured areas and primarily associated with basalt parent material with some limestone parent material (TES 460).

Several major map units (TES 432, 461, 464) have multiple soil condition ratings ranging from satisfactory to unsatisfactory. Loss of ground cover due to juniper canopy density and subsequent loss of fine soil particles is the most common reason for the unsatisfactory rating in these units. Soils with satisfactory ratings generally have lower juniper densities and thus higher vegetative ground cover (VGC) that maintains soil function.

Vegetation:

Tree canopy density affects understory vegetation for individual locations of TES map units having pinyon/juniper vegetation. As the density of pinyon and juniper trees increases, the understory species decrease in diversity and cover (West and VanPelt, 1986, Tress and Klopatek, 1986). The point at which the canopy dominates vegetation varies between map units but the Draft Ecological Classification (Girard, M. and W. Robbie 2003) documents canopy density at between 25% and 40% for most map units to be that point.

Two map units, TES 427 (0-15% slopes) and TES 432 (10-35% slope) show the most impacts from livestock use. These are the areas where changing livestock management can be most effective at changing resource conditions. Most of TES 461 is limited by woody cover but livestock use has caused localized impacts on sites with lower woody cover. Other map units contain limited areas of concentrated grazing, usually near water, but overall the effects of grazing are not limiting vegetative ground cover, though they may be affecting grass species diversity. Although livestock are seen in map units of 50% and greater slope, these areas receive only incidental use and few measurable grazing effects were found in inspections or on plots. Therefore these areas are not further discussed.

Direct and Indirect Effects

Alternative 1: Removal of livestock would improve vegetative ground cover, grass diversity, and soil condition on all map units where grazing is a limitation. This includes most of 2,600 acres (TES 427, 432) and portions of 13,914 acres (TES 460, 461, 462, 464). The increase of vegetation ground cover and lack of compaction from livestock grazing would improve soil conditions.

Alternative 2: Current grazing management would continue to result in lower vegetative ground cover and limited grass diversity on approximately 1604 acres of TES 427 and 432 and in limited areas of TES 461. Soil conditions would remain degraded in these areas.

On the majority of TES 460, 462, and 464 high juniper cover would continue to limit vegetative ground cover production and soil degradation would continue. Livestock grazing has minimal to no impact on these sites.

Alternative 3: Reduction of juniper canopy on 2,560 acres on Bald Hill Allotment, 1,061 acres on Squaw Peak Allotment, and 147 acres on Copper Canyon Allotment (there were no identified needs on the Young Allotment) would occur. Acres treated vary in tree canopy density but all lack grass cover and litter between trees. Many of these acres are currently in unsatisfactory soil

condition because of canopy cover and would improve with canopy reduction. However, the improvement in ground cover would be lessened because there would be a minimal decrease in grazing intensity and in some cases no change in livestock management.

Alternative 4: Bald Hill – Expected improvement in vegetative ground cover, grass diversity and soil condition on 1604 acres of TES 427 and 432 in Bates/Bull pastures due to lower allowable use. On TES 461, 462, and 464 there would be a small improvement to vegetation ground cover, grass diversity and soil conditions. However, these sites would continue to be limited by the high juniper cover resulting in continued reduction in soil function. Livestock grazing has minimal impact on these sites.

Copper Canyon – No change from Alternative 2 because there is no juniper density reduction proposed.

Squaw Peak – Expected improvement in vegetative ground cover, grass diversity, and soil condition on 183 acres of TES 427 and in localized areas of TES 461 because the grazing intensity would decrease. On TES 460, 461, 462 and other TES units where juniper canopy is dense, there would be a slight improvement to vegetation ground cover, grass diversity, and soil conditions because of the lower grazing intensity. However, degradation would continue because of the high juniper cover. Livestock grazing has minimal to no impact on these sites.

Young – No change from Alternative 2 since the proposed management strategy remains the same as in Alternative 2.

Alternative 5: Bald Hill – Vegetative ground cover, grass diversity and soil conditions would improve on all 2,604 acres of TES 427 and 432 because of lower grazing intensity. The improvement in Bates/Bull pastures would be less than Alternative 1 because grazing would continue.

On TES 461, 462, and 464 there would be a slight improvement to vegetation ground cover, grass diversity and soil conditions because of the lower grazing intensity. These sites would continue to be limited by the high juniper cover and degradation would continue. Livestock grazing has minimal to no impact on these sites.

Copper Canyon – There would be a slight improvement to vegetation ground cover, grass diversity and soil conditions because of the lower grazing intensity. These sites would continue to be limited by the high juniper cover and degradation would continue. Livestock grazing has minimal to no impact on these sites.

Squaw Peak – Same as Alternative 4 and therefore would have the same effects as that alternative.

Young – Reduced utilization would result in no measurable difference between Alternatives 2, 3, or 4 since short duration grazing remains the management strategy.

Desert Shrub/Desert Grassland

This vegetative formation covers 4,451 acres (12% of total project area) in the Verde Valley on the Copper Canyon, Squaw Peak and Young Allotments. These are areas of livestock concentration and higher available forage, and are given particular attention in this analysis.

Affected Environment

Soils:

This ecosystem has gentle to moderately steep slopes with deep soils and has a slight to severe erosion hazard rating. The soils are formed from alluvium limestone parent material and are slightly to moderately alkaline with a medium to coarse surface texture.

Soil conditions vary from impaired to unsatisfactory. Degradation is primarily due to inherent ecosystem characteristics such as calcareous or saline soils and erosive alluvial soils, although livestock use has caused some compaction in localized areas.

Vegetation:

This formation was accessible from the Verde River and proximate to a market for cattle and was subject to high intensity livestock grazing beginning in the 1860's. Existing vegetation data indicates that shrub cover is higher and grass cover lower on many areas when compared to TES predicted. The shrub component appears to have reached a point where shrubs will continue to dominate these sites, and grasses will stabilize at amounts much lower than potential or may continue to decline. These sites appear to have lost the ability to reach their predicted potential without treatments to reduce/eliminate shrub species. Improved livestock management may result in increases in herbaceous plant material but livestock management alone will not be sufficient to restore species composition and diversity to that described by TES.

Effects of historic grazing are probably responsible for the shift in equilibrium that allowed shrubs to become the dominant growth form on most of this formation. Those effects include reduced vigor and increased mortality to grasses, less fine fuel to carry fires, and reduced ground cover to retain soil moisture.

Three TES map units make up this formation:

TES 368. Shrub cover is 466% of predicted (predicted 9%, present 34.5%) and grass cover is only 37% of predicted (38% potential, 14% present). Two polygons show current impacts from grazing and one of those polygons has extensive recreational use impacts.

TES 382. Shrub cover is 150% of predicted (23% predicted, 35 % present). Grass cover is only 38% of predicted (34.5 % predicted, 13% present). The difference in shrub cover is not uniformly limiting as on some plots the dominant shrub was snakeweed which does not limit grass but does indicate disturbance from grazing. Shrub cover does limit about 650 acres and another 250 acres is losing grass to shrub cover. The remainder of the map unit has the greatest potential change with improved management.

TES 383. Shrub cover is 158% greater than predicted (21.5% predicted, 34% present). Grass cover is only 80.9% of predicted (21% predicted, 17% present). The main difference in grass cover is the lack of New Mexico needlegrass which is projected to be present at 6-8%. This species was not found in plots or inspections and is a weak perennial so the difference in cover may not be meaningful. Shrub canopy limits ground cover creating soil instability in some areas. Grazing effects on TES 383 are localized near water and this unit is expected to change least by alternative.

Direct and Indirect Effects

Alternative 1: Improvement in vegetative ground cover, grass diversity, and soil condition is expected on the following TES map units:

- TES 368: An estimated 136 acres in Lucky pasture and another 50 acres near water in Copper Canyon pasture would improve with no grazing.
- TES 382: 850 acres on Squaw Peak, Copper Canyon, and Young Allotments.
- TES 383: 133 acres near Cottonwood Spring (Copper Canyon Allotment).

Overall, across the formation, there would be an improvement due to a decrease in compaction and increased herbaceous ground cover, especially on TES 382. However, a continued decline would be expected on approximately 550 acres of map units TES 382 and 383 in Copper Canyon Allotment because of increasing mesquite, prickly pear and other woody plant cover. Conditions are also expected to continue to degrade on TES 368 because of its inherent soil characteristics (PR#114).

Alternative 2: Vegetative ground cover, grass diversity, and soil condition is expected to remain low and remain degraded on approximately 1169 acres currently affected by livestock grazing, and continue to degrade on another 550 acres because of increasing woody cover.

Alternative 3: Squaw Peak – Stocking would be reduced by 1/3 and the area grazed would be reduced, but because utilization does not change, those areas that are grazed would remain similar to existing condition. This is an improvement over Alternative 2. Reduced stocking is expected to increase vegetative ground cover, grass diversity, and soil condition as a result of reduced grazing distribution and the possibility that deferment of grazing could be accomplished with available water.

Copper Canyon – An estimated 550 acres would improve in the Copper Canyon and Lucky Pastures because the prescribed fire would reduce the mesquite and prickly pear cactus density and improve vegetative ground cover, grass diversity, and soil conditions. However, improvement would be limited because current livestock management would not change. The remainder of the grassland conditions would remain the same as Alternative 2.

Young – No difference from Alternative 2 as there would be no change in management strategy.

Alternative 4: Reduced allowable use on the Squaw Peak Allotment and the Cottonwood pasture of Copper Canyon Allotment addresses the majority of map unit 382 most affected by

grazing. Reducing grazing intensity would improve vegetative ground cover, grass diversity, and soil conditions.

On the Copper Canyon Allotment, prescription for fire does not change between Alternatives 3 and 4. However, reduced grazing intensity in burned areas is expected to result in improved resource conditions over Alternative 3.

Young – No difference from Alternative 2 because there is no change in management strategy.

Alternative 5: Reduced allowable use/utilization lessens the grazing intensity on the areas in all map units and allotments affected by grazing. This would improve vegetative ground cover, grass diversity, and soil conditions over Alternative 4. Effects on Squaw Peak, containing most of the areas impacted by livestock grazing, are the same as Alternative 4 because livestock management would not change.

On the Copper Canyon Allotment, prescription for fire does not change between Alternatives 3, 4, and 5. However, reduced grazing intensity in burned areas is expected to result in improved resource conditions over Alternative 3 and 4.

On the Young Allotment reduced utilization would result in no measurable difference between Alternatives 2, 3, or 4 since short duration grazing remains the management strategy.

Chaparral

Three map units make up the 3, 842 acres (10% of project area) in the chaparral vegetative formation. Two of the map units are in the 40 -120% slope class. Stands differ in parent material and slope, but the vegetative composition of this community, generally, includes higher tree, lower shrub, and higher grass cover than described at potential.

Although fire occurrence is normally common in this community type, the chaparral in this analysis area does not have documented fire occurrence. This is possibly due to being located near developed areas in the Verde Valley or being located on moist east and north slopes.

Affected Environment

Soils:

This ecosystem is found on gentle to very steep slopes with a shallow to deep soil depth and has a slight to severe erosion hazard rating. The soil surface texture is medium to coarse texture and is well armored with a high surface rock cover.

The majority of this ecosystem has satisfactory soil conditions and shows no adverse impacts from livestock grazing. However, some soil degradation is occurring within this ecosystem because of inherent soil characteristics, high shrub cover, and, in some cases, livestock grazing.

Vegetation:

TES 551 receives grazing in the Box T Pasture on Copper Canyon Allotment. Grazing is concentrated in flatter areas or near the #511 motorized recreation trail but cattle can also be seen moving across steep slopes to preferred grazing.

TES 469 is 0-15% slope at lower elevations and is typically grazed.

Plots on TES 551 found more tree and grass cover and less shrub cover than TES predicts. Grass species diversity is greater than TES predicted. Inspections documented similar conditions. Soils are stable and little bare ground occurs. Light use limits grazing impacts.

The 172 acres of TES 469 on Copper Canyon is shrub dominated with no grass. On Squaw Peak TES 469 receives varying amounts of grazing. Much of the unit is grazed with acceptable effects but approximately ½ of the 670 acre southern polygon is grazing impacted and has less grass and litter than predicted.

Direct and Indirect Effects:

Alternative 1: Vegetation ground cover, grass diversity, and soil conditions would show the greatest rate and extent of improvement than any alternative because there would be no impacts from livestock grazing. Recovery of the southern polygon on the Squaw Peak Allotment would be fastest with no grazing and the low potential grass cover (9%) would be easiest to maintain without grazing.

Alternative 2: Vegetative ground cover, grass diversity, and soil conditions would remain the same because of current livestock management.

Alternative 3: This alternative would slightly reduce grazing intensity on Squaw Peak but would retain the current utilization. Vegetative ground cover, grass diversity, and soil conditions would improve slightly but, because there is water in the chaparral, localized areas would remain degraded. Areas that have negligible to no impacts from livestock grazing effects would have little to no change.

Alternative 4: This alternative would reduce grazing intensity on Squaw Peak by lowering utilization to 25% with no seasonal variation. Lower stocking would reduce grazing intensity and allow some level of grazing deferment by controlling livestock access to water. Vegetative ground cover, grass diversity, and soil conditions would improve and localized degraded areas would stabilize. Areas that have negligible to no impacts from livestock grazing effects would have little to no change.

Alternative 5: Reduced utilization would result in no measurable difference between this alternative and Alternative 4 since the grazing prescription applied to this ecosystem is the same for both alternatives.

Riparian Resources

Riparian areas occupy 248 acres throughout the project or only 1% of the project area. Two types of areas fall into a TES classification in this formation but only one of them supports riparian vegetation. TES 034 includes rarely flooded alluviums containing ephemeral channels with a large bedload and a xeric vegetation component but no riparian plant species. TES 041 has varying amounts of water and riparian vegetation potential. Information on specific riparian sites is found in the watershed condition/water quality section.

Soils and Vegetation Cumulative Effects

Soils and Vegetation:

Watershed condition is the basis used to evaluate the cumulative effects of soil and vegetation condition. Soil and vegetation resources and the management activities that impact these resources occurring within the cumulative effects analysis area are included as part of the watershed condition discussion.

WATERSHED CONDITION

The vegetation communities discussed above are spread across the analysis area within three 5th-level watersheds; Ash Creek-Sycamore Creek, Cherry Creek-Upper Verde River, and Fossil Creek – Lower Verde River (PR#106).

The Ash Creek-Sycamore Creek watershed drains into the Agua Fria River. The other two watersheds drain into the Verde River (PR# 106).

Watershed Condition incorporates the inherent sensitivity of the watershed and the amount the watershed has been impacted. These two concerns are broad scale and incorporate the upslope conditions. Since channel and riparian areas are less extensive, add important habitat diversity and provide for the transport of necessary water, nutrients and woody materials, the condition of riparian areas and channel functions are discussed specifically.

Affected Environment

Ash Creek-Sycamore Creek

The entire 5th-level Ash Creek/ Sycamore Creek watershed was chosen as an analysis area. In this watershed water quality standards are attaining beneficial use and are not being negatively impacted by soil conditions. Current conditions show a general upward trend. However there are riparian areas that are being negatively impacted by cattle.

This watershed contains the greatest portion of the Bald Hill Allotment, as well as small portions of the Copper Canyon and Squaw Peak Allotments. There are no streams in the Copper Canyon Allotment portion, and only a ½-mile of Horner Gulch (no riparian vegetation potential), and part of Arnold Canyon in the Squaw Peak Allotment portion.

The main drainages of the watershed associated with the project are Arnold Canyon and Cienega Creek, both of which drain into Ash Creek. There are also two large developed springs, Joe Best and Reimer.

Arnold Canyon has surface flow from the banks and from a hand dug well at the Arnold Place homestead. This flow occurs for about 1 mile below the Arnold Place in the Arnold and Bald Hill Pastures. The Proper Functioning Condition (PFC) rating (USDI – Bureau of Land Management 1998) in the Arnold Pasture is *Functional*. In this section the channel is naturally constricted with step-pool formation and stable well-vegetated banks. Riparian vegetation is healthy and diverse.

In Bald Hill Pasture, just downstream, the channel has become wider and shallower. Although the stream is in a canyon and access is limited the area is grazed and is below vegetative potential. The PFC rating is *At Risk* because riparian vegetation has been impacted by grazing and does not have the necessary diversity in either composition or age class for a healthy system.

Cienega Creek has some inflow from springs but most of the creek is dry. Riparian species may produce seedlings but they do not survive. This suggests that the water submerges below the rooting zone and is no longer available to support this type of community. However, there is intermittent water associated with geologic features that move water to the surface and allow riparian vegetation to develop. There are two areas where this occurs one has an existing exclosure. The other is located at the boundary between the Forest and private lands and has no exclosure. Here, cattle have impacted the riparian vegetation and have caused bank damage. The PFC rating for the Creek as whole is *functional*.

Joe Best Spring, on an upper fork of Cienega Creek, has an exclosure. The channel within this exclosure has reestablished a thalweg (thread of flow) and riparian vegetation is healthy and expanding. About ¼ mile above the exclosure, there has been an increase in channel function where check dams have allowed cottonwoods to become established. The PFC rating is *functional* due to the expanding healthy conditions.

Reimer Spring flows from an exclosure in Reimer Draw on the Cienega Allotment to the Bald Hill Allotment where it is accessed by cattle in a water lane. The PFC rating is *functional* due to the overall channel hydrology although cattle graze the riparian vegetation heavily within the water lane.

Cherry Creek/ Upper Verde River

This watershed incorporates land on both sides of the Verde River and involves less than 2% of the project area. For these reasons, and to concentrate rather than dilute the potential effects of the project, the analysis area is Gaddis Canyon and the area between it and the southern watershed boundary, rather than the entire Cherry Creek/ Upper Verde 5th code watershed.

Gaddis Canyon Analysis Area

This watershed drains into the Verde River. This reach of the Verde River was listed as being impaired due to turbidity levels by Arizona Department of Environmental Quality (ADEQ). A turbidity Total Maximum Daily Load (TMDL) was approved by the Environmental Protection Agency (EPA) in 2002, but this section remains listed as *not attaining* for Aquatic and Wildlife:

Warm Water Aquatic Community until monitoring indicates that designated uses are being attained.

Gaddis Canyon includes about ¼ of the Copper Canyon Allotment and only a minute portion of the Bald Hill Allotment. There is neither perennial nor intermittent flow in this analysis area. A section of ephemeral channel was assessed as having a PFC rating of *At Risk* due to sediment entering from adjacent steep upland areas but cattle were not affecting this condition.

In the general area gullies are stable, with vegetation growing in the bottoms, the soil surface allows good water infiltration and there is good channel hydrologic function.

Fossil Creek-Lower Verde River

This watershed incorporates land on both sides of the Verde River and encompasses most of both the Copper Canyon and the Squaw Peak Allotments, as well as a portion of the Bald Hill Allotment. Because the watershed incorporates land on both sides of the Verde River, it has been divided into three smaller analysis areas to allow a more focused look at the potential effects of the project. These analysis areas are not all true watersheds, but are designed to facilitate answering water quality concerns.

No Name Analysis Area

The northern analysis area begins at the northern watershed boundary of the Fossil Creek/ Lower Verde 5th code watershed and extends south nearly to West Clear Creek. This area includes the drainages of Copper, Lucky, and Ryal Canyons and drains into the Verde River.

Copper Canyon drainage has intermittent water that moves a short distance through the Bull Pasture (Bald Hill Allotment) then through the Tompkins Pasture and the upper part of the Copper Canyon Pasture (Copper Canyon Allotment).

The Bull Pasture section of the drainage is not accessible to livestock and receives no livestock use. This section has a PFC rating of *functional*.

The Tompkins Pasture section of the drainage has varying amounts of riparian woody plants indicating potential. Winter grazing pressure is light because the canyon is a cold air sink and livestock graze the slopes above the drainage in cool weather. In warm weather the riparian vegetation is grazed heavily. The PFC rating for this area is *At Risk* because the riparian vegetation does not reflect potential due to grazing pressure.

Copper Canyon Pasture section has sycamore trees and seep willow growing in the channel. Large rocks inhibit livestock access and it shows little evidence of grazing upstream of the homestead where riparian vegetation is found. This segment had been disrupted by freeway runoff, and then stabilized with jersey barriers. The PFC assessment is rated *Functional* with diverse and healthy riparian vegetation.

Ryal Canyon is a steep walled drainage with intermittent flows originating from Ryal and Cottonwood Springs before going dry. Livestock obtain water near a recreation trail bridge but do not tend to graze within the drainage. The condition is rated as *At Risk, with an upward trend*.

Lucky Canyon has perennial pools and was rated as being *Functional*.

Beasley Flats Analysis Area

The middle analysis area, Beasley Flats, incorporates several unnamed drainages that drain into the Verde River. The drainages have no surface flow or riparian vegetation. The current PFC rating is *At Risk*, due to the lack of water.

Chasm Creek Analysis Area

The southern analysis area is the true watershed of **Chasm Creek**. This watershed drains into the same segment of the Verde River as the Beasley Flats analysis area.

Chasm Creek has perennial pools and intermittent flow in the upper drainage but no livestock grazing occurs there. Downstream pools near the Squaw Peak Allotment boundary are used by cattle when there is water, but the steep gradient and bouldery bed of the channel limits riparian potential to the Sycamore trees that grow there and grazing is not a factor on development of vegetation. Livestock grazing is not a factor in development of the riparian vegetation. The PFC rating is *Functional*.

Direct and Indirect Effects

Water quality, the condition and functioning of hydrologic and soil properties, and the condition and functioning of channel and riparian areas can all be affected by management actions.

The difference between alternatives in potential effects is displayed in Table 3.1, and discussed below.

The impact index is a measure of management activities that have the potential to impact watershed condition, including water quality, and the condition and proper functioning of soils, channels and riparian areas. Impact index is a percentage of the watershed that has been impacted; that is, acres impacted by human activities divided by total analysis acres.

The impact index is one indicator which allows quantification of potential effects. There is an obvious change in the impact indices due primarily to removal of cattle (Alternative 1), the increase in areas excluded from grazing (riparian enclosure), or reduced allowable use/utilization (Alternatives 3 – 5). However, some of the change is the improvement resulting from adaptive management procedures.

TABLE 3.1 Comparison of Watershed Effects

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
	Watershed Condition				
Impact Index	0.5%	No change from project area impact index of 8.7%	Short-term increase due to prescribed fire, but overall reduction to 7.5%	Short-term increase due to prescribed fire, but overall reduction to 4.1%	Short-term increase due to prescribed fire, but overall reduction to 2.0%
Upslope condition	Slight improvement	no change	Greatest improvement due to juniper/ desert shrub treatment	Less improvement than Alternative 3; more than alternative 1 due to Rx fire	Less improvement than Alternative 3; more than alternative 1 due to Rx fire

Channel Function					
Profile and Dimensions	Gradual improvement	Gradual localized improvement	Less extent than Alternative 1; greater than Alternative 2	Less extent than Alternative 1; greater than Alternative 3	May cover a larger area and react more spontaneously than Alternative 4.
Sediment	Greatest extent of improvement.	Baseline, continuation of existing conditions	General improvement from Alternative 2, but potential of short term increase due to prescribed fire.	Same as Alternative 3 except that more riparian areas are enclosed, increasing bank and channel bottom protection, but lower overall extent than Alternative 1.	Same as Alternative 4
Riparian					
Vegetation (density and diversity)	Greatest extent of improvement.	Baseline, continuation of existing conditions	Slight improvement over Alternative 2; within exclosures.	Addresses more problem areas than Alternative 2, but affects a lesser extent than Alternative 1	May cover a larger area and react more spontaneously than Alternative 4.
Soils (function)	Greatest extent of improvement.	Baseline, continuation of existing condition	Very slight improvement over Alternative 2	Addresses more problem areas than Alternative 2, but affects a lesser extent than Alternative 1	May cover a larger area and react more spontaneously than Alternative 4.
Water Quality					
Stream impairment	No change	No change	No change	No change	No change

Alternative 1:

Watershed condition: Alternative 1 has no actions to improve soil conditions on a large scale. However, the removal of cattle would cause an overall improvement from reduced utilization of herbaceous material, especially along channels. However, this alternative contains neither juniper removal nor prescribed fire which would actively remove woody plants and encourage herbaceous cover.

Channel profile and dimension: There would be a gradual system-wide repairing of impacted channel dimensions brought about as sediment sources, both local and from upstream areas, are no longer activated, and vegetation stabilizes eroding banks and disturbed floodplains. This would lead to the development of floodplain and thalweg formation in segments that had been severely impacted, reestablishing proper form and function.

Riparian area condition: Areas with riparian potential that are affected by livestock grazing would gradually develop to potential.

Alternative 2:

Watershed condition: Alternative 2 has no actions to improve soil conditions on a large scale.

Channel profile and dimensions: Current conditions show a general upward trend, due to the use of adaptive management. Those riparian areas not currently protected by fencing would continue to degrade.

Riparian area condition: The Forest has responded to drought conditions by reducing livestock numbers and/ or changing season and duration of use. However, without the riparian exclosures and change of seasons proposed in Alternatives 3, 4 and 5, or the lack of grazing in Alternative 1, those riparian areas not currently protected by fencing would continue to degrade.

Alternative 3:

Watershed condition: Alternative 3 proposes fewer riparian exclosures than Alternatives 4 and 5. Alternative 3 proposes treatment of juniper and desert shrub canopy removal, leading to improved soil conditions on over 3,750 acres. Alternatives 3, 4 and 5 each propose approximately 550 acres of prescribed fire which would improve watershed condition by leading to an increase in herbaceous cover.

Channel profile and dimension: Alternative 3 increases riparian protection on Bald Hill at Reimer Spring and Cienega Creek by extending existing exclosures. Copper Canyon Allotment continues winter use of Tompkins pasture and provides for additional riparian fencing in the Copper Canyon drainage if needed. Upslope juniper removal treatments would increase herbaceous cover and reduce surface runoff and soil transport to the channel network.

Riparian area condition: Alternative 3 proposes fewer riparian exclosures than Alternatives 4 and 5, but more than Alternative 1.

Alternative 4:

Watershed conditions: Alternative 4 proposes more area within riparian exclosures than Alternatives 2 or 3, but provides less protection than Alternative 1. This alternative does not contain juniper removal treatments, but does propose prescribed fire treatments on approximately 550 acres. Generally, the overall effects on watershed condition are the same as Alternative 5, although they may not occur as quickly.

Channel profile and dimension: As in Alternative 3 the exclosures at Reimer Spring and in Cienega Creek would be extended on Bald Hill. In addition, new exclosures would be constructed in Arnold Canyon and in Cienega Creek at the Forest boundary with private land providing riparian protection in more areas than Alternative 3. Effects to Copper Canyon would be the same as Alternative 3. Sediment delivery would not be reduced by upslope juniper removal treatments.

Riparian area condition: More riparian areas would be protected from grazing and trampling than with Alternatives 2 and 3, although, at least initially, not as well as in Alternative 5.

Alternative 5:

Watershed conditions: The reduced utilization proposed in Alternative 5 would probably have greater positive impact on the vegetative resources than the Forest policy of adaptive management because grazing intensity would be reduced throughout the project and not just in areas of concern. Generally, the overall effects on watershed condition are the same as Alternative 4 because other management practices (e.g. riparian area fencing, prescribed burning, winter only pasture use, grazing duration) remain the same as Alternative 4.

Channel profile and dimensions: Channel changes may occur more quickly than in Alternatives 2, 3, and 4 due to vegetative response in riparian areas.

Riparian area condition: The reduced utilization proposed in Alternative 5 would initially have greater positive impact on the vegetative resources than the Forest policy of adaptive management. At least initially, effects would be more noticeable than Alternative 4.

Cumulative Effects

Cumulative effects analysis considers other activities within the larger analysis area that may cause the same type of disturbance as those proposed by the project, in this case, cattle grazing. Such activities are those that may increase sediment delivery to the drainage network, impact channel profile, reduce riparian area functioning, or destabilize slopes. Such activities include roads, urban development, recreation use, fire/brush crushing, gold-panning, other mining operations, or cattle grazing in areas outside of the project area boundaries.

Watersheds have a certain resiliency to management activities that is based on a number of factors such as soil ability to infiltrate water, channel stability and functioning to transport nutrients and water, and riparian area existence and functioning as a sponge to help control peak flows.

The Natural Sensitivity Index (NSI) is the percentage of the analysis area that consists of sensitive resource acres (riparian community existence, severe soil erosion hazard, potential for soil compaction, gully, soils rated as being in unsatisfactory or impaired condition, and calcareous conditions on gentle slopes) that is acres of sensitive acres divided by total analysis area acres. The Natural Sensitivity Indices of the watersheds in the project area is high (PR#106).

TABLE 3.2 Summary Table for Cumulative Effects within Analysis Areas

Watershed	Sensitivity Index	Impact Index	Proposed Fire/ brush crush	
			Acres	%
Ash Creek-Sycamore Creek Watershed	86.7	10.4	4,289	2.5%
Gaddis Canyon Analysis Area	87.4	25.5	0	0.0%

Fossil Creek / Lower Verde Watershed: No Name analysis area	98.5	20.5	550	3.4%
Fossil Creek / Lower Verde Watershed: Beasley Flats analysis area	81.8	19.1	0	0.0%
Fossil Creek / Lower Verde Watershed: Chasm Creek Analysis Area	99.0	0.5	0	0.0%
Average	90.6	11.5		

Ash Creek/ Sycamore Creek Watershed

There are scattered parcels of in holdings within this watershed concentrated in the southeastern portion generally on sensitive soils and land development is increasing. However, the greatest impacts from urbanization (compaction and creation of impermeable surfaces, increase of drainage network and flow quantities and power) are not being duplicated by cattle, at least in the project area and thus this project is not contributing to cumulative effects from these other activities.

Some portions of 18 grazing allotments are in this watershed. While cattle have caused negative impacts in portions of this watershed in the past, none of the alternatives propose actions that will increase these impacts on this watershed, and most of the alternatives include actions (such as an enclosure on Cienega Creek and change of season below the Arnold place) that may locally improve it. Thus this project would not contribute to cumulative effects from the other allotments.

There are approximately 271 miles of roads, and 27 mines of various statuses. There is only minor off-road recreation. Roads, mining, and off-road recreation are causing only minimal impacts, and the greatest impacts, such as increasing the entrance of water and sediment to the drainage network during storm events, are not duplicated by cattle. Therefore, this project would not contribute to cumulative effects from these other activities.

Approximately 2,035 acres in the juniper-pinyon ecotype have been treated to reduce juniper densities in the past. An additional 2560 acres are proposed under Alternative 3. Most of these acres are located on soils rated as being in unsatisfactory or impaired condition. Reducing overstory would lead to improved herbaceous cover and soil functioning on these acres. Cumulatively Alternative 3 would contribute incrementally to an improved vegetative mosaic, reduced soil impairment, and improved watershed condition through the improved hydrologic function of the total treated acres.

In the recent past, approximately 9,900 acres were burned during the Cherry prescribed fire. Currently the Mingus fuels reduction project proposes burning approximately 4,289 acres and an active prescribed fire program has been pursued in the grassland areas of this watershed. Since

1981 over 100,000 acres have been burned, some locations more than once. While the result has been decreased sediment transport due to the increase in herbaceous cover, there are no prescribed fires planned in this watershed under this project nor does cattle grazing duplicate fire effects. Thus there would be no contribution to cumulative effects from this project.

Water quality has not been an issue in this watershed (ADEQ 2004; PR#106). Proposed project actions would not increase danger to water quality because of the large size of the watersheds in relation to the project area. Thus there would be no contribution to cumulative effects from this project.

Cherry Creek/ Upper Verde Watershed – Gaddis Canyon Analysis Area

There are scattered parcels of private inholdings within this watershed, concentrated in the southeastern portion and generally on sensitive soils, and land development is increasing. However, the greatest impacts from urbanization, compaction and creation of impermeable surfaces, increase of drainage network and flow quantities and power, are not being duplicated by cattle, at least in the project area. Thus, there would be not contribution to cumulative effects from this project.

Cattle are not known to be the cause of any malfunctioning riparian area or channel conditions within this watershed. There are no cumulative actions presently occurring, or known of in the future, that would cause or increase project negative impacts on channel, riparian or watershed condition.

There are approximately 16 miles of roads, and one active mine. There is no known off-road recreation. Roads and mining are causing only minimal impacts, and the greatest impacts, such as increasing the entrance of water and sediment to the drainage network during storm events, are not duplicated by cattle. Thus, there would no contribution to cumulative effects from this project.

Water quality has been an issue in this watershed (ADEQ 2004; PR#106). Proposed project actions will not increase danger to water quality because of the large size of the watersheds in relation to the project area. Thus there would be no contribution to cumulative effects from this project.

Fossil Creek/ Lower Verde Watershed – No Name Analysis Area

There are parcels of private inholdings within this watershed concentrated in the southeastern portion generally on sensitive soils and land development is increasing. However, the greatest impacts from urbanization, compaction and creation of impermeable surfaces, increase of drainage network and flow quantities and power, are not being duplicated by cattle, at least in the project area. Thus, there would be no contribution to cumulative effects from this project.

While cattle have caused negative impacts in portions of this watershed, none of the alternatives propose actions that would increase negative impacts on this watershed, and most of the alternatives include actions (such as a change of season in the Tompkins Pasture) that may locally improve it. Thus, there would be no cumulative effects associated with this project from cattle grazing.

There are approximately 34 miles of roads, two historical mines, and four mines in planning status. There is only minor off-road recreation and no additional allotments in this analysis area. Roads, mining, and off-road recreation are causing only minimal impacts, and the greatest impacts, such as increasing the entrance of water and sediment to the drainage network during storm events, are not duplicated by cattle. Thus, there would be no contribution to cumulative effects from this project.

A prescribed fire project of approximately 900 acres is part of Alternative 3 and 550 acres in Alternatives 4 and 5. This fire is planned to improve soil and watershed health by increasing vegetative diversity, litter production and soil structure. While this will help watershed health effects of fire are not additive since there have been no other prescribed fires in this “watershed” and effects are not duplicated by cattle grazing. Thus, there would be no contribution to cumulative effects from this project.

Water quality in the Verde River segment bordering this “watershed” is an issue of concern (ADEQ 2004; PR#106). While land managed by the Prescott National Forest transports water, sediment and nutrients downstream, channels pass through irrigated and developed lands before reaching the Verde River. Leaking septic tanks are the largest likely source of *E.Coli* and any contribution from Forest lands due to cattle grazing is negligible. Thus, this project could incrementally contribute to cumulative effects, but the amount of the contribution would not be measurable, as compared to other actions.

Fossil Creek/ Lower Verde Watershed – Beasley Flat Analysis Area

There are parcels of private inholdings within this watershed concentrated in the southeastern portion and generally on sensitive soils, and land development is increasing. However, the greatest impacts from urbanization, compaction and creation of impermeable surfaces, increase of drainage network and flow quantities and power, are not being duplicated by cattle, at least in the project area. Thus, there would be no contribution to cumulative effects from this project.

While cattle have caused negative impacts in portions of this “watershed” in the past, none of the alternatives propose actions that would increase these impacts, and most of the alternatives include actions (controlling access to water and reducing utilization) that may locally improve it. Thus, there would be no contribution to cumulative effects from this project.

There are approximately 15 miles of roads, and six mines of various status. There is only minor off-road recreation and no additional allotments in this analysis area. Roads, mining, and off-road recreation are causing only minimal impacts, and the greatest impacts, such as increasing the entrance of water and sediment to the drainage network during storm events, are not duplicated by cattle. Thus, there would be no contribution to cumulative effects from this project.

Fossil Creek/ Lower Verde Watershed – Chasm Creek Analysis Area

While cattle in the adjacent non-project allotment (Brown Springs) are causing negative riparian area or channel conditions along the Verde River, the problems have been addressed in the recently completed Verde River Wild and Scenic River Plan (USDA Forest Service 2004). Since this “watershed” primarily consists of the Cedar Bench wilderness, grazing is light and impacts are minimal. Thus, there would be a minimal contribution to cumulative effects from this project.

There are approximately 6 miles of roads, and no known mines. There is only minor off-road recreation. These activities are causing only minimal impacts, and the greatest impacts, such as increasing the entrance of water and sediment to the drainage network during storm events, are not duplicated by cattle. Thus, there would be no contribution to cumulative effects from this project.

Conclusion:

The watersheds tributary to the Verde River appear to be moving towards equilibrium with sediment deposition, after a period of incision in the late 19th and early 20th centuries (USDA Forest Service 2001). In response to environmental conditions (such as drought) permitted numbers for cattle are currently at their lowest level in Forest history. This project would not contribute to cumulative adverse effect on riparian, channel or watershed condition and the alternatives contain proposals that will increase the function of specific important sites (riparian areas). There may continue to be adverse direct impacts, but these are most likely to occur where there is water or salt, and as riparian enclosures are extended, would decrease.

WILDLIFE and RARE PLANTS

The WSR (Wildlife Specialist Report, PR # 131) contains detailed analyses for all federally listed species, federally proposed species, Region 3 Regional Forester's Sensitive Species, PNF (Prescott National Forest) MIS (Management indicator species), appropriate migratory birds (includes PIF [Partners In Flight] priority species), and AGFD (Arizona Game and Fish Department) Wildlife of Special Concern. Appendix 2 contains the list of the above species for which no effects were identified because the species is not present in the project area and habitat is not present or would not be affected by project activities (PR#131). Species impacted by this project are discussed below. The effects of the alternatives are considered to include all actions associated with the project including livestock grazing, livestock moving and herding, maintenance and construction of fences, stock tanks, and drinkers, prescribed fire, and juniper treatments.

Razorback Sucker (Endangered), Colorado Pikeminnow (Experimental non-essential), Roundtail Chub (Sensitive)

There is no occupied, suitable or potential habitat in the project area for razorback sucker, Colorado pikeminnow, or roundtail chub. The Squaw Peak Allotment abuts the Verde River, which is occupied habitat, but is fenced to exclude livestock access to the river. Razorback sucker and Colorado pikeminnow occur in the Verde River as a result of ongoing reintroductions (1981 to present) of hatchery-reared fish stocked into the river. Long-term survival or recruitment from these fish reintroductions has never been documented (Hyatt 2004). Causal factors are thought to be high predation by non-native fish species and poor conditioning of hatchery-reared fish. The population status of roundtail chub in the Verde River is classified as Unstable-Threatened mainly because of suspected high predation and/or competition from non-native fish species (Voeltz 2002).

Direct and Indirect Effects

All Alternatives: There are no direct effects to the species because they are not present in the project area and livestock are excluded from accessing the Verde River. Watershed analysis of the 5th code watersheds in the Forest conclude that activities in the uplands, including livestock

grazing, are not having a discernable effect on the river at this time (USDA Forest Service 2001, Rocky Mt Research Station 2001). These alternatives would not have any measurable indirect effects to water quality and would not change existing aquatic habitat conditions or alter fish community composition and population trends and therefore would not have any measurable effects to TE&S fish populations in the Verde River.

Cumulative Effects

The cumulative effects area for the TE&S fish includes those portions of the Cherry Creek and Fossil Creek – Verde River 5th code watersheds affected by the project area.

All Alternatives: The following actions have been determined to potentially affect TE&S fish and their aquatic habitats in the Verde River:

* The majority of land adjacent the Verde River in the Camp Verde area is in private ownership. Population growth and housing developments have increased in the area. Land development in the watersheds may result in increases in runoff and flow of sediments to the river because of ground disturbing actions and conversion to impermeable surfaces. A turbidity TMDL for the Verde River is in place and will address turbidity loading from all potential sources through implementation of BMPs (ADEQ 2001). These actions would help to maintain and improve water quality which is a beneficial effect to TE&S fish.

* Livestock grazing occurs on other National Forest Service system (NFS) lands in the watersheds. Management actions such as livestock grazing exclusion from occupied and critical habitat have been taken to reduce effects to T&E fish species. In addition, BMPs are implemented throughout the watershed on NFS lands to improve watershed, soil, and riparian conditions and maintain water quality on the forests. These actions would help to maintain and improve water quality and aquatic habitat conditions which is a beneficial effect to TE&S fish.

* The Brown Springs Allotment will be fenced to exclude livestock grazing along 12-miles of the Verde River just downstream of the project area. Livestock grazing impacts to water quality would be eliminated because of reduced impacts to alterable streambanks that could result in excess sedimentation affecting macroinvertebrates (food supply). This action would help to maintain and improve water quality and aquatic habitat conditions which are a beneficial effect to TE&S fish.

* A portion of the Verde River Wild and Scenic River (VWSR) occurs in the Fossil Creek – lower Verde River 5th code watershed from Beasley Flat downstream to the confluence with Fossil Creek. The VWSR Management Plan (USDA Forest Service 2004) includes direction to maintain “Outstanding Remarkable Values” for native fish species and their habitats along the 40-miles of designated river. Under the management plan livestock grazing along the river corridor will not be authorized, vehicle access within the VWSR corridor will be reduced by closing numerous roads, and human waste and campfire ash will be removed by overnight boaters. These actions would have beneficial effects to TE&S fish because of reduced effects to water quality.

With no direct or measurable indirect effects to these species, there would be no contribution from this project to cumulative effects of the above activities.

Razorback Sucker - designated Critical Habitat

Designated CH (critical habitat) is not present in the project area, although there is CH in the Verde River adjacent to the project area. The Verde River is CH for the razorback sucker from Perkinsville downstream to Horseshoe Reservoir (U.S. Fish and Wildlife Service 1994). Water quantity and quality are being affected by land development, surface water diversions, and groundwater withdrawals in the watershed and along the river. Physical habitat in the river is mainly affected by major flooding events and subsequent drought periods. Recent flooding in winter of 2004 – 2005 restructured habitats throughout the Verde River. The biological environment in this reach of the river is out of balance due to introduced non-native fishes that are a source of predation and competition to native fish species.

Direct and Indirect Effects

All Alternatives: There would be no direct effects to CH because it is not present in the project area and livestock are excluded from accessing the Verde River. Watershed analysis of the Verde River 5th code watersheds on the Forest conclude that activities in the uplands, including livestock grazing, are not having a discernable effect on the river at this time (USDA Forest Service 2001, Rocky Mt Research Station 2001). These Alternatives would not result in any measurable indirect effects to water quality parameters and would not change the existing aquatic habitat conditions or alter the existing fish community composition and population trends. Thus, these alternatives would not have any measurable effects to CH in the Verde River.

Cumulative Effects

All Alternatives: The cumulative effects area is the same as noted above for the fish species. With no direct or measurable indirect effects to these species, there would be no contribution from this project to cumulative effects.

Southwestern willow flycatcher (Endangered/PIF)

The SWWF (Southwestern willow flycatcher) is a riparian obligate species that requires dense habitat of willows and other native/nonnative trees and shrubs situated along rivers, streams, and other wetland areas. There is no occupied or proposed critical habitat within the project area. Riparian habitats in Copper Canyon, Chasm Creek, Cienega Creek, and Arnold Canyon are narrow stringers of riparian vegetation with steep gradients (>5%) and narrow floodplains that do not provide potential habitat for SWWF. The nearest occupied SWWF site occurs on private lands along the Verde River in Camp Verde about 2-miles north of the project boundary. The Camp Verde site is surrounded by an abundance of high quality BHC (brown-headed cowbird) foraging habitat such as agricultural fields, short-grass lawns, bird feeders, livestock corrals and pastures; and high quality breeding habitat from extensive riparian habitat along the Verde River. Lower pastures on the Copper Canyon Allotment and the entire Young Allotment have been deferred from grazing (annually since 1998) during the SWWF critical season (April 1 to July 31) to mitigate for potential nest parasitism by BHC.

Direct and Indirect Effects

All Alternatives: There are no direct effects to SWWF because they do not occur in the project area.

Alternative 1: With no livestock grazing in the project area, there would be no indirect effects from BHC nest parasitism to SWWF at the Camp Verde site.

Alternatives 2, 3, 4, 5: With livestock grazing in the project area, the alternatives would not have any measurable effects of BHC parasitism to SWWF at the Camp Verde site because of the application of the mitigation measure of a 2-mile buffer (U.S. Fish and Wildlife Service 2004) during the SWWF critical season for livestock activities in the project area (Chapter 2 - Mitigation).

Cumulative Effects

The cumulative effects area includes a 2-mile radius from the SWWF nesting site on the Verde River in Camp Verde. The main impacts within the site are from ATV user created trails that criss-cross the area (SWCA, Inc., Environmental Consultants 2000; R. Valencia 2005). This activity can impact SWWF because of direct and/or indirect disturbance to the species during the nesting season and reduction in riparian habitat quality/quantity from ATV trampling of vegetation. SRP (Salt River Project) has recently purchased 124 acres that contains the SWWF site and is drafting a Management Plan to address issues/impacts to the site (R. Valencia 2005). In addition, BHC trapping has been implemented in the area as mitigation for the Harvard Investments (now called Simonton Ranch) proposed housing development adjacent the site. These actions would help to reduce disturbance to the species during the nesting season and improve riparian habitat at the site which is a beneficial effect to the SWWF.

All Alternatives: With no direct or measurable indirect effects to these species, there would be no contribution from this project to cumulative effects.

Yellow-billed Cuckoo (Sensitive/PIF)

The YBC (Yellow-billed cuckoo) is a riparian obligate species that occurs mainly in mature gallery forests of cottonwood-willow communities. YBC are a migratory bird in Arizona, arriving the first week of June and typically depart by late August or early September. The species was recorded in Arnold Canyon near Arnold Place Spring in 2002 surveys (PR#43). This area is within the Arnold Pasture, Bald Hill Allotment, and is a winter use only pasture. Riparian habitats in Copper Canyon, Chasm Creek, Cienega Creek, and lower Arnold Canyon are narrow stringers of riparian vegetation with steep gradients (>5%) and narrow floodplains that do not provide potential habitat for YBC.

Direct and Indirect Effects

All Alternatives: There would be no direct effects to species because livestock grazing would not occur during the YBC nesting season of June through August.

Alternative 1, 4, 5: With no livestock grazing in the project area or with fencing to exclude livestock grazing from YBC habitat, there would be no indirect effects to the species.

Alternative 2, 3: With livestock grazing in the project area, utilization levels would provide for regeneration of riparian trees for YBC habitat but at less potential than alternatives 1, 4, and 5 because of grazing and trampling impacts to young trees. Currently, riparian habitat is a small stand of mature, high canopy trees. YBC habitat quality would be maintained similar to existing conditions.

Cumulative Effects

The cumulative effects for the YBC include activities that would impact the species or its habitat in the project area. There are no identified activities in the Arnold Canyon area that would have cumulative effects to the species.

Alternative 1, 4, 5: With no direct or indirect effects to the species, there would be no contribution from this project to cumulative effects of the above activities.

Alternatives 2, 3: With no direct effects and minimal indirect effects to the species, there would be no contribution from this project to cumulative effects of the above activities.

Lowland leopard frog (Sensitive) and Arizona toad (Sensitive)

The LLF (lowland leopard frog) occurs in Chasm Creek, Copper Canyon, upper Cienega Creek, and Joe Best Spring in the project area (PR# 29, 40, 43). No AZT (Arizona toad) was observed during surveys but they have been documented in the project area vicinity (Sullivan 1993) and have a high probability of occurring in these drainages. There are no livestock grazing impacts to occupied habitat within Chasm Creek, upper Cienega Creek, Joe Best Spring, and portions of Copper Canyon because of limited access due to rough terrain or riparian exclosures. The lower reach of Copper Canyon within the Tompkins pasture, Copper Canyon Allotment, has some accessible reaches and has recently been assigned for winter-use only.

Direct and Indirect Effects

Alternative 1: With no livestock grazing in the project area, there would be no direct effects to the species. LLF and AZT habitat quality would improve in accessible reaches of Copper Canyon because of an increase in herbaceous vegetation and improved streambanks needed for cover. This Alternative may increase the local population.

Alternatives 2, 3, 4, 5: With livestock grazing in the project area, there may be some disturbance to individuals and trampling impacts to habitat because of livestock grazing or trailing in accessible reaches along Copper Canyon but such impacts would be minimal because of limited access to the canyon on the Bald Hill Allotment and from exclosures and a recent change to winter-use only on the Tompkins Pasture on the Copper Canyon Allotment. In addition, there are no livestock grazing impacts to riparian/aquatic habitat within Chasm Creek due to limited access and rough terrain (PR#117).

Cumulative Effects

The cumulative effects for the LLF and AZT include activities that would impact the species or its habitat in the project area. Jersey barriers have been installed at road crossings along Copper Canyon to stabilize the drainage system and helped to maintain and improve riparian function which is a beneficial effect to LLF and AZT.

Alternative 1: With no direct and indirect effects, there would be no contribution to cumulative effects on this species from this project.

Alternatives 2, 3, 4, 5: With non-measurable direct and indirect effects because of the limited habitat affected there would be no contribution from this project to cumulative effects.

Mearns sage (Sensitive) and Hualapai Milkwort (Sensitive)

The Mearns sage occurs at several sites in the Lucky Pasture, Copper Canyon Allotment (USDA Forest Service 2003a). The Hualapai milkwort also occurs in the Lucky Pasture in association with Verde Valley sage and along a section of Forest Trail 521 near Ryal Spring (USDA Forest Service 2003a). Populations are all considered healthy. The Lucky Pasture is not assigned any livestock capacity due to limitations of soils to forage production and inherently unstable soils. The milkwort is distasteful to livestock (Kearney and Pebbles 1960).

Direct and Indirect Effects

Alternative 1: With no livestock grazing in the project area, there are no direct or indirect effects to the species.

Alternatives 2, 3, 4, 5: With livestock grazing in the project area there would be minimal impacts to plants or habitat from incidental grazing, trampling, and trailing. These Alternatives may impact individuals but would not impact the local population or the species.

Cumulative Effects

The cumulative effects for the Mearns sage and Hualapai milkwort include activities that would impact the species or its habitat in the project area. There are no identified activities in the Lucky Pasture or Ryal Springs area that would have cumulative effects to the species.

All Alternatives: With no direct or measurable indirect effects to the species, there would be no contribution from this project to cumulative effects.

Management Indicator Species (MIS)

Forest level habitat and population trends for Management Indicator Species (MIS) were discussed in *Forest Level Analysis of Management Indicator Species for the Prescott National Forest* (PR#72) and excerpted for the following MIS analyzed in the project area. The mule deer is the MIS for early seral Pinyon/Juniper vegetation. The juniper (plain) titmouse is the MIS for late seral and the snag component of Pinyon/Juniper vegetation. Lucy’s warbler is the MIS for late seral riparian vegetation.

Table 3.3 Summary of Vegetation Seral Stage Changes for MIS Habitat on the PNF from 1987 through 2003

Vegetation Type	1987 Acres	2003 Acres	% Change	Habitat Trend
Pinyon/ Juniper	683,795	Late to early change = 13,445 acres	-2.0	Stable
Riparian	17,160	Early to late change = 1,624 acres	9.5	Up

Table 3.4 Estimated population trend for MIS at the forest level (2003)

Population Trend	Management Indicator Species
Decreasing	Mule deer

Stable	Lucy's warbler
Stable	Juniper (Plain) titmouse

Table 3.5 Effects to MIS habitat by Alternative (Acres/% Change)

MIS Species	Current Forest-wide Habitat	Acres of Habitat in Project Area	Alt. 1 Acres Affected / % of Change Forest-wide	Alt. 2 Acres Affected / % of Change Forest-wide	Alt. 3 Acres Affected / % of Change Forest-wide	Alt. 4 & 5 Acres Affected / % of Change Forest-wide
Mule Deer	683,795	27,145	0	0	3768 / 5	0
Juniper titmouse	683,795	27,145	0	0	- 3768 / - 5	0
Lucy's warbler	17,160	161	50 / 0.3	-50 / -0.3	- 50 / - 0.3	50 / 0.3

Mule Deer (MIS – early seral pinyon/juniper vegetation)

Alternative 1, 2, 4, and 5: These alternatives would result in no change in the seral stage of habitat for mule deer, thus there would be no effects to Forest-wide habitat and population trends.

Alternative 3: This Alternative would result in a small (<1%) increase in habitat quantity for mule deer because of 3768 acres of juniper treatments that would result in change from late to early seral stage. However, the total increase is too small to alter Forest-wide habitat and population trends.

Juniper (Plain) Titmouse (MIS/PIF – late seral and snag component of pinyon/juniper)

Alternative 1, 2, 4, and 5: These Alternatives would result in no change in the seral stage of habitat for juniper titmouse, thus there would be no effects to Forest-wide habitat and population trends.

Alternative 3: This Alternative would result in a small (<1%) decrease in habitat quantity for juniper titmouse because of 3768 acres of juniper treatments that would result in change from a late to early seral stage. However, the total decrease is too small to alter Forest-wide habitat and population trends.

Lucy's Warbler (MIS/PIF – late seral riparian vegetation)

Alternative 1, 4, 5: These Alternatives would result in a small (<1%) increase in habitat quantity and quality for Lucy's warbler because riparian areas, primarily along Arnold Canyon, would not

be grazed and would result in a change to a later seral stage. However, the total increase is too small to alter Forest-wide habitat and population trends.

Alternative 2, 3: These Alternatives would continue to limit a small (<1%) area of riparian habitat quantity and quality for Lucy's warbler because riparian areas, primarily along Arnold Canyon, would be grazed and would result in less potential for regeneration of riparian tree to mature to a late seral stage. However, the total increase is too small to alter Forest-wide habitat and population trends.

Migratory Birds

PIF (Partners in Flight) has identified physiographic areas and high priority bird species by broad vegetation habitat types. The criteria for identifying priority bird species was based on relative abundance, breeding distribution, winter distribution, threats on breeding grounds, threats on non-breeding grounds, threats on winter grounds, and the importance of Arizona to each species.

The PNF provides nesting habitat for a host of migratory birds each spring and summer. Several PIF priority species also are PNF MIS or Regional Forester's Sensitive species. The PNF uses these PIF bird species as indicators for migratory birds. Assessing the impacts of a project on these PIF bird species meets the intent of the Migratory Bird Treaty Act. With regards to addressing additional bird species for this project, there is no indication that any of the proposed activities would cause major changes in vegetation or overall loss of habitat diversity. For this reason, the assessment of migratory birds is limited to those species on the federally listed, sensitive or MIS lists. See the individual affects analyses above for the Southwestern willow flycatcher, Yellow-billed cuckoo, Juniper (plain) titmouse, and Lucy's warbler the only migratory species potentially impacted by the project.

OTHER RESOURCES

Air Resources: There would be little or no effect to air resources because there would be no increases in bare ground that would contribute to dust and the prescribed burning in Alternatives 3, 4, and 5 would follow smoke management guidelines (PR#118).

Wilderness Resources: Approximately 3800 acres of the Cedar Bench Wilderness are a part of the Squaw Peak Allotment and grazing in the wilderness is an accepted practice allowed by the Wilderness Act.

Livestock use is limited due to steep, rocky slopes, thick woodland vegetation, and the general lack of reliable water. Use by people is also light due to its remote location and difficult to get to access points as well as the lack of available potable water.

Since this wilderness is hard to get to by both livestock and people the area is not overused by either. The wilderness character is mostly present and with not a lot of human influence in the area there are opportunities for solitude and/or a primitive, unconfined types of recreation (PR #115).

Verde Wild and Scenic River: Approximately 40 acres of the Verde Scenic River corridor are located within the formal boundaries of the Squaw Peak Allotment. This area (encompassing Beasley Flat) is a developed recreation day use/river access area and has been wholly fenced

since 1996, thereby fully excluding the area from livestock grazing (PR#116). Therefore, there would be no direct, indirect or contributions to cumulative effects.

Heritage Resources: There will be no effect to known heritage resources because of the dispersed nature of livestock grazing, lack of any sites where range improvements are proposed and the consultation/surveys necessary for any future ground disturbing activity related to this project (PR#129).

OTHER FINDINGS

Public Health and Safety: Management concerns regarding public health and safety are not identified in the Purpose and Need for the Action (Chapter 1), nor is public health and safety identified as a public issue (Chapter 1, PR# 61). Therefore, it is concluded that public health and safety will not be significantly affected.

Prime Farmlands: Prime farmlands are determined based upon various factors such as soil parent material, soil depth, climatic regime, slope, and plant community. The presence or absence of areas within the project area that could be classified as prime farmlands was determined by analysis of existing ecological condition plot data collected for the Terrestrial Ecosystem Survey (TES) and for the Ecological Classification of the Prescott National Forest, as well as field data collected during range inspections. No prime farmlands were identified as a result of this review.

Range Structures: There are no proposed new range structures in Alternatives 1 and 2. Alternative 3, 4, and 5 propose structures that are identified in Chapter 2. Indirect effects were accounted for when predicting the vegetation, soil and water quality/quantity effects as they relate to livestock distribution. The existing range water collection devices would have a very minimal impact upon water quantity from a watershed scale. The proposed range improvements direct effects associated with Alternative 3, 4 and 5 have the potential to produce minimum negative impacts upon vegetation, soil and water conditions in the short term. The disturbance associated with the impacts of constructing these improvements has a minimal potential to compact soils and decrease VGC. A potential increase of run off, erosion, and degradation of water quality and quantity would be mitigated by implementing Best Management Practices (BMPs). BMPs have been developed and are located in Appendix 1 – Best Management Practices.

Economics: The Verde Rim allotments are located in Yavapai County, which is a rapidly growing non-metropolitan county. As a result of the rapid population growth, the county is economically diverse. Now a majority of employment comes from service and professional/technical occupations rather than ranching and farming.

Employment by occupation

	Percent of Total
Government	20.6
Trade, Transportation & Utilities	19.5
Education & Health Svcs	15.9
Leisure & Hospitality	13.5
Construction	10.6
Professional & Business Svcs	08.0
Manufacturing	06.2
Financial Activities	03.6
Natural Resources (including livestock grazing)	01.8

Source: Arizona Department Commerce 2003

Ranching operations in this area tend to be characterized by small profit margins with the need for off-ranch supplemental income in order to continue operations. Because these operations are small in relation to the county economy as a whole, there is no discernible impact on the local economic structure with or without the operations.

Likewise, there is no discernible impact on the local social structure of the county due to the small size of the project in relation to the County's diversified social structure.

While there are no discernable economic or social impacts at the county level, there are resource benefits and potential impacts at the local level. Water developments on the allotments, especially in the upland areas, aids in the distribution of various wildlife species and can lead to increased wildlife presence. For this reason, Arizona Game and Fish Department financially supports many of these water developments.

When the Forest Service allows livestock management on an allotment, the livestock permittee may have an improved ability to maintain his/her private land as open space. As open space, resources such as wildlife and fish habitat, visual and air quality are preserved. Rural areas such as the permit holder's private lands are prime candidates for subdivision development as evidenced by the continuous development activities through out northern Arizona. If the private land ranch were to go out of operation, it is possible these lands would be subdivided and open space values lost.

Environmental Justice: A specific consideration of equity and fairness in resource decision-making is encompassed in the issue of environmental justice and civil rights. As required by law and Executive Order, all Federal actions should consider potentially disproportionate effects on minority or low-income communities, minority groups, women, and consumers. Where possible, measures should be taken to avoid negative impacts to these communities and groups or mitigate the adverse affects.

The project area is not within a concentrated area of low income, high unemployment, or high poverty (Table 3.6). Therefore, none of the alternatives would result in any disproportionate impacts to low-income or minority populations and women. However, there may be an adverse impact to individual permittees and local consumers, depending on the alternative that is selected for implementation.

Table 3.6 - Population Trends and Economic Levels

	United States	Arizona	Yavapai Co.
% Unemployed	3.7	3.4	2.7
% Families Below Poverty Level	9.2	9.9	7.9
% Individuals Below Poverty Level	12.4	13.9	11.9
% Minorities	22.9	36.2	13.4

¹ Source: U.S. Bureau of Census. Census 2000 Summary File (SF 3) - Sample Data. Minority Data Source: U.S. Bureau of Census, 2000. Census 2000 Redistricting Data (PL94-171) Summary File, and Profiles of Gener

APPENDICIES

1. Best Management Practices
2. Threatened, Endangered, and Sensitive Species not Affected by Project
3. References Cited
4. Maps

APPENDIX 1 BEST MANAGEMENT PRACTICES

Soil and water conservation measures are means to comply with the Non-Point Source Section of the Clean Water Act and the Intergovernmental Agreement (IGA) signed by the Forest Service (R3) and the Arizona Department of Environmental Quality (ADEQ) (Jolly et al, 1990). As per the IGA, the most practical and effective means of controlling potential non-point source pollution is through the development of Best Management Practices (BMPs). The general BMP categories were largely derived from the Forest Service Handbook but were supplemented and modified to meet project needs. The number affiliated with each BMP references Southwestern Region FSH 2509.22.

The following BMPs will be employed. Practice numbers and titles are followed by a brief explanation of site-specific application plans.

22.0 Range Management

The development of Alternatives considered soil and water conservation practices. These practices are integrated in the management actions of each Alternative. The management parameters considered for soil and water conservation practices utilize the adaptive management concept to achieve attainable desired conditions. Some management strategies considered are: discouraging use on unsatisfactory soils, assigning stocking levels, improving livestock distribution, creating deferred rotations, setting utilization standards, and adjusting season and duration of use.

22.1 Range Analysis, Allotment Management Plan, Grazing Permit System, and Permittee Operating Plan.

An interdisciplinary approach was used in an analysis of alternatives. The forest plan and other policy and procedural guidance were reviewed. The scope of the project was narrowed to livestock grazing management and included effects on vegetation, watershed/soils, and wildlife. The chosen alternative will be incorporated into 10-year term Permits for each allotment analyzed. Annual operating instructions will be utilized to implement the permits.

22.11 Controlling Livestock Numbers and Season of Use.

Livestock will be managed to respond to fluctuations in weather, and resultant variances in forage production. Stocking levels will be adjusted up or down based on Rangeland Health Inspections and/or Soil Condition Field Sheet. Season of use is rotated among pastures generally using a deferred rotation system and utilization guidelines will be employed.

22.12 Controlling Livestock Distribution.

Pasture fencing and natural barriers are used to control the distribution of grazing on all allotments. Distribution within each pasture occurs by controlling access to water, by herding, and by locating salt to encourage use of side slopes or other areas of unused forage.

22.13 Rangeland Improvements.

Existing waters and fences will be reconstructed and maintained as needed. Adaptive management strategies may lead to constructing new facilities in order to achieve the desirable attainable effects.

22.14 Determining Grazing Capability of Lands.

The Terrestrial Ecosystem Survey (TES) was used to determine site characteristics and attainable potential condition which is the ecological capability of the land. Adaptive management strategies will be implemented so livestock grazing does not prevent soil condition improvement or adversely affect vegetative cover and diversity.

22.15 Revegetation of Areas Disturbed by Grazing Activities.

No revegetation of grazed areas is expected to be necessary. Natural vegetation expansion resulting from improvements in livestock management and timing of grazing use will result in desired conditions.

25.12 Protection of Wetlands and Riparian Areas.

Grazing effects of riparian areas are controlled through adaptive management techniques such as season and duration of use and/or riparian exclosures.

25.2 Evaluation of Cumulative Watershed Effects.

The cumulative effects for soils and water quantity and quality were analyzed from a watershed scale.

Range Improvement Installations

The following BMP's provide general guidelines for newly constructed range improvements. Range improvements may be constructed as an adaptive management technique.

24.22 Special Erosion Prevention Measures on Disturbed Land

All areas of surface disturbance will be treated following completion to prevent erosion. Areas will be ripped or scarified, and smoothed or sloped to return the areas to its natural contours, if deemed necessary.

24.16 Streamside Management Zone

All areas within 150 feet of a riparian area are in a streamside management zone. These areas require special soil and water conservation prescription prior to implementation.

25.16 Soil Moisture Limitations

All operations will be conducted during periods when the probabilities for precipitation, wet soils, and runoff are low.

25.18 Revegetation of Surface Disturbed Areas

All areas that have disturbance will be evaluated to determine if reseeding is necessary or if natural recruitment is adequate. TES will be used to determine the appropriate grass seed specification.

24.3 Slash Treatment in Sensitive Areas

All areas will be mulched with vegetation slash, certified weed free hay, or any other material deemed appropriate

24.14 Protection of Extremely Unstable Lands

Range improvement installation locations will avoid unstable lands. Unstable lands that are unavoidable will require special erosion control measures.

41.25 Maintenance of Roads

Road maintenance will concentrate on improving drainage. Road drainage measures will not channel run-off directly into streamcourses. This includes out-sloping the road and maintaining leadoff ditches. Roadwork will not occur during wet or storm conditions.

31.13 Prescribe Burn

The following BMPs provide general guidelines for the proposed prescribed fire in Alternative 3, 4 and 5.

Burn prescriptions will be done so that all of the organic matter is not consumed and in a mosaic pattern.

Burnt sites will be inspected to determine if areas need reseeding or whether any other soil conservation practices are required.

31.0 Fire Recovery

Recovery/Establishment: Livestock use will not be permitted until the soils and vegetation have recovered (USDA & USDI, 2002).

Grazing Management After Recovery/Establishment Period: An evaluation is required at the end of the second growing season to determine if additional practices are needed (USDA & USDI, 2002).

24.0 Juniper Treatment

The following BMPs provide general guidelines for the proposed juniper treatment in Alternative 3.

All operations will be conducted during periods when the probabilities for precipitation, wet soils, and runoff are low.

All areas within 150 feet of a riparian area are in a streamside management zone. These areas require special soil and water conservation prescription prior to implementation.

All juniper slash will be retained on site to protect the soil surface from soil erosion and improve infiltration rates.

APPENDIX 2
THREATENED, ENDANGERED and SENSITIVE PLANTS and ANIMALS
MANAGEMENT INDICATOR SPECIES
NOT AFFECTED BY THE PROJECT

Prescott National Forest

Scientific name	Common name	Status
<i>Poeciliposis o. occidentalis</i>	Gila topminnow	E
<i>Haliaeetus leucocephalus</i>	Bald eagle	T
<i>Strix occidentalis lucida</i>	Mexican spotted owl	T
<i>Meda fulgida</i>	Spikedace	T
<i>Tiaroga cobitis</i>	Loach Minnow	T
<i>Gila intermedia</i>	Gila chub	PE
<i>Falco peregrinus</i>	American peregrine falcon	S
<i>Cicindela oregona maricopa</i>	Maricopa tiger beetle	S
<i>Thamnophis rufipunctatus</i>	Narrowheaded garter snake	S
<i>Xantusia vigilis arizonae</i>	Arizona night lizard	S
<i>Pyrgulopsis glandulosa</i>	Verde Rim springsnail	S
<i>Agave delamateri</i>	Tonto Basin agave	S
<i>Chrysothamnus molestus</i>	Tusayan rabbitbrush	S
<i>Erigeron saxatilis</i>	Rock dwelling fleabane	S
<i>Eriogonum e. var. ericofolium</i>	Heathleaf wild buckwheat	S
<i>Eriogonum ripleyi</i>	Ripley wild buckwheat	S
<i>Hedeoma diffusum</i>	Flagstaff pennyroyal	S
<i>Heuchera eastwoodiae</i>	Eastwood alum root	S
<i>Lupinus latifolius spp. leucanthus</i>	Broad-leafed lupine	S
<i>Phlox amabilis</i>	Arizona phlox	S
<i>Arenaria aberrans</i>	Mt. Dellenbaugh sandwort	S
<i>Accipiter gentilis</i>	Northern goshawk	S/MIS/PIF
<i>Sciurus aberti</i>	Abert squirrel	MIS
<i>Sitta pygmyaea</i>	Pygmy nuthatch	MIS
<i>Meleagris gallopavo</i>	Turkey	MIS
<i>Picoides villosus</i>	Hairy woodpecker	MIS

*** Status Definitions:**

- ◆ **E** Listed Endangered under the ESA: Any species that is in danger of extinction throughout all or a significant portion of its range.
- ◆ **T** Listed Threatened under the ESA: Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- ◆ **PE** Proposed Endangered under the ESA: Any species that is proposed in the Federal Register to be listed under Section 4 of the Endangered Species Act.
- ◆ **C** Candidate Taxon, Ready for Proposal.
- ◆ **S** Sensitive: Those species listed on the Regional Forester's Sensitive Species list for the Southwestern Region of the Forest Service.
- ◆ **MIS** Management Indicator Species: Species identified in the PNF FLMP FEIS (page 95) for various vegetation types and seral stages.
- ◆ **PIF** Partners in Flight priority bird species (Latta, 1999)

APPENDIX 3 REFERENCES CITED

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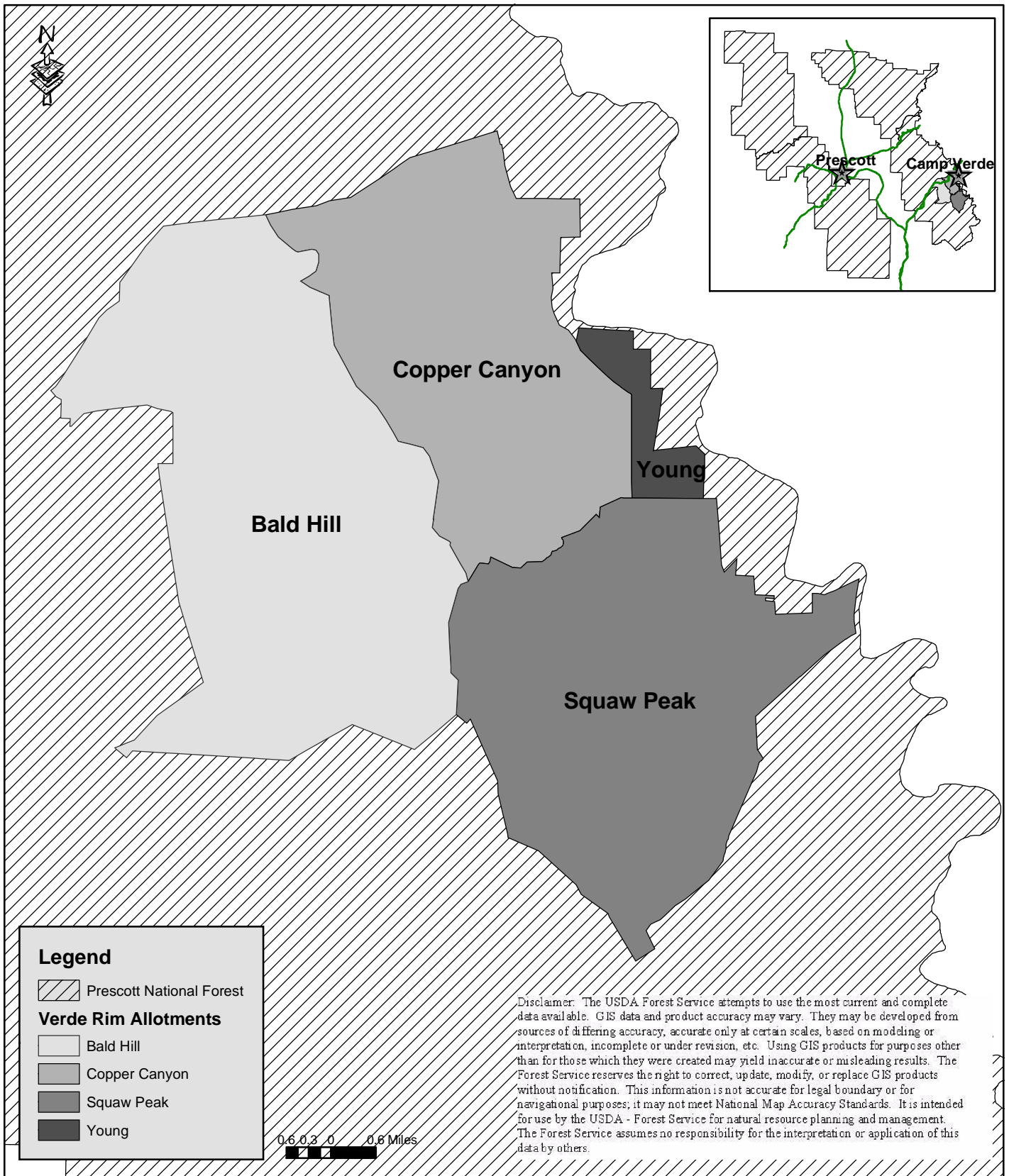
West, N.E. and N.S. Van Pelt. 1986. *Successional Patterns in Pinyon-Juniper Woodlands*. Pp 43-52 in Everett, R.L. 1986. Proceedings – Pinyon-Juniper Conference, January 13-16, 1986. Reno Nevada. Intermountain Research Station, Ogden, UT. 581 pgs.

Appendix – Best Management Practices

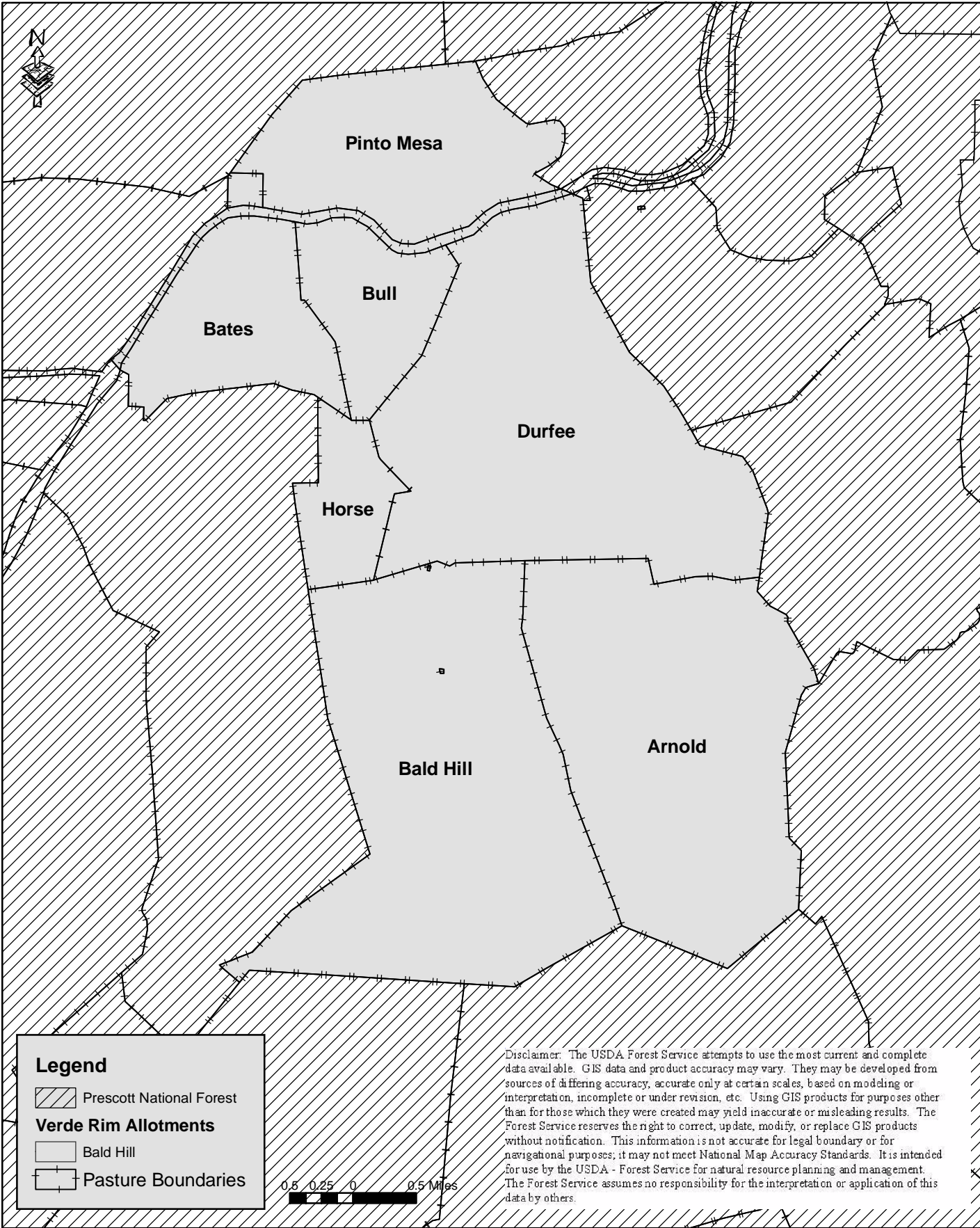
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Verde Rim Grazing Allotments



Bald Hill Allotment

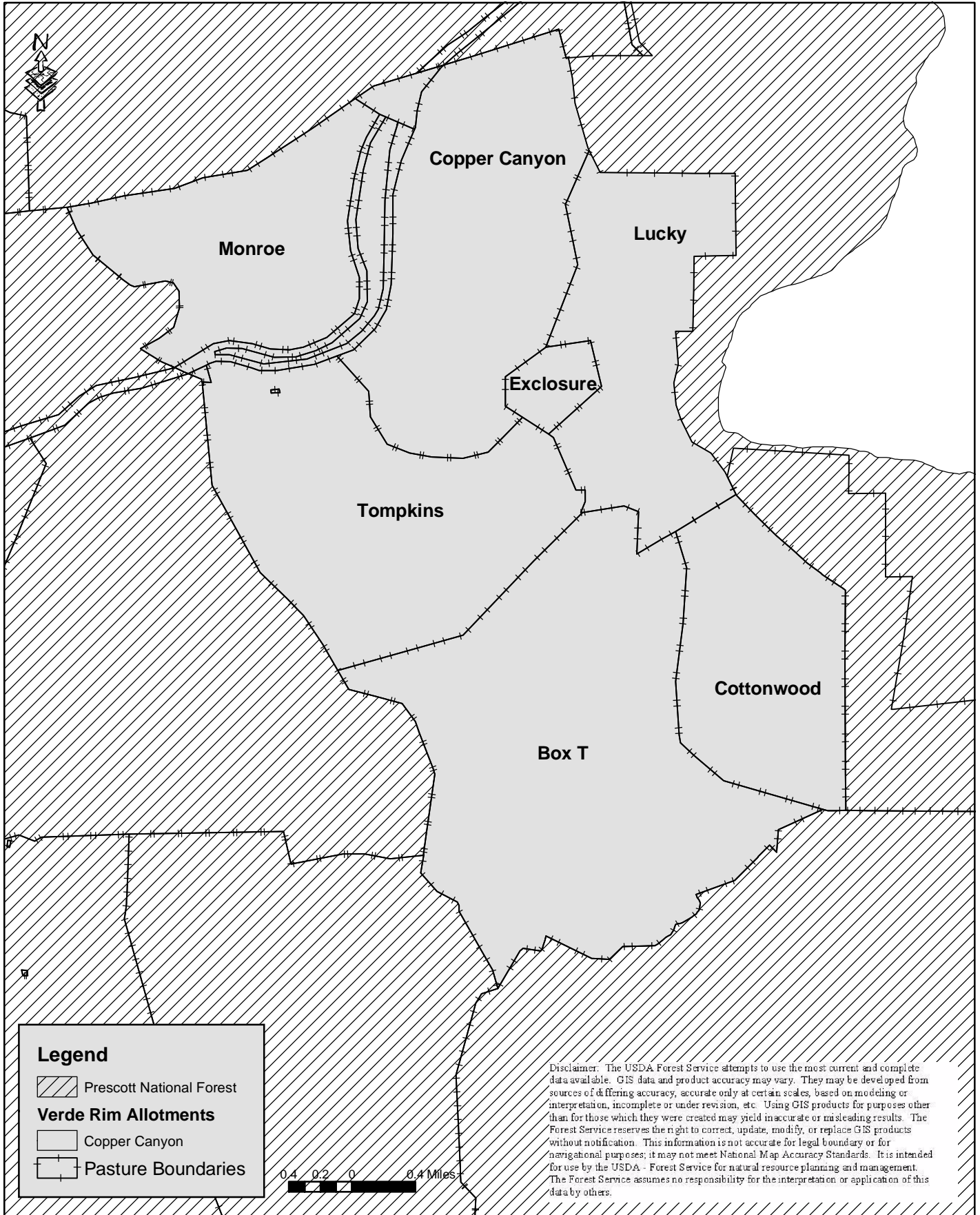


Legend

- ▨ Prescott National Forest
- Verde Rim Allotments**
- ▭ Bald Hill
- - - Pasture Boundaries

Disclaimer: The USDA Forest Service attempts to use the most current and complete data available. GIS data and product accuracy may vary. They may be developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete or under revision, etc. Using GIS products for purposes other than for those which they were created may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. This information is not accurate for legal boundary or for navigational purposes; it may not meet National Map Accuracy Standards. It is intended for use by the USDA - Forest Service for natural resource planning and management. The Forest Service assumes no responsibility for the interpretation or application of this data by others.

Copper Canyon Allotment

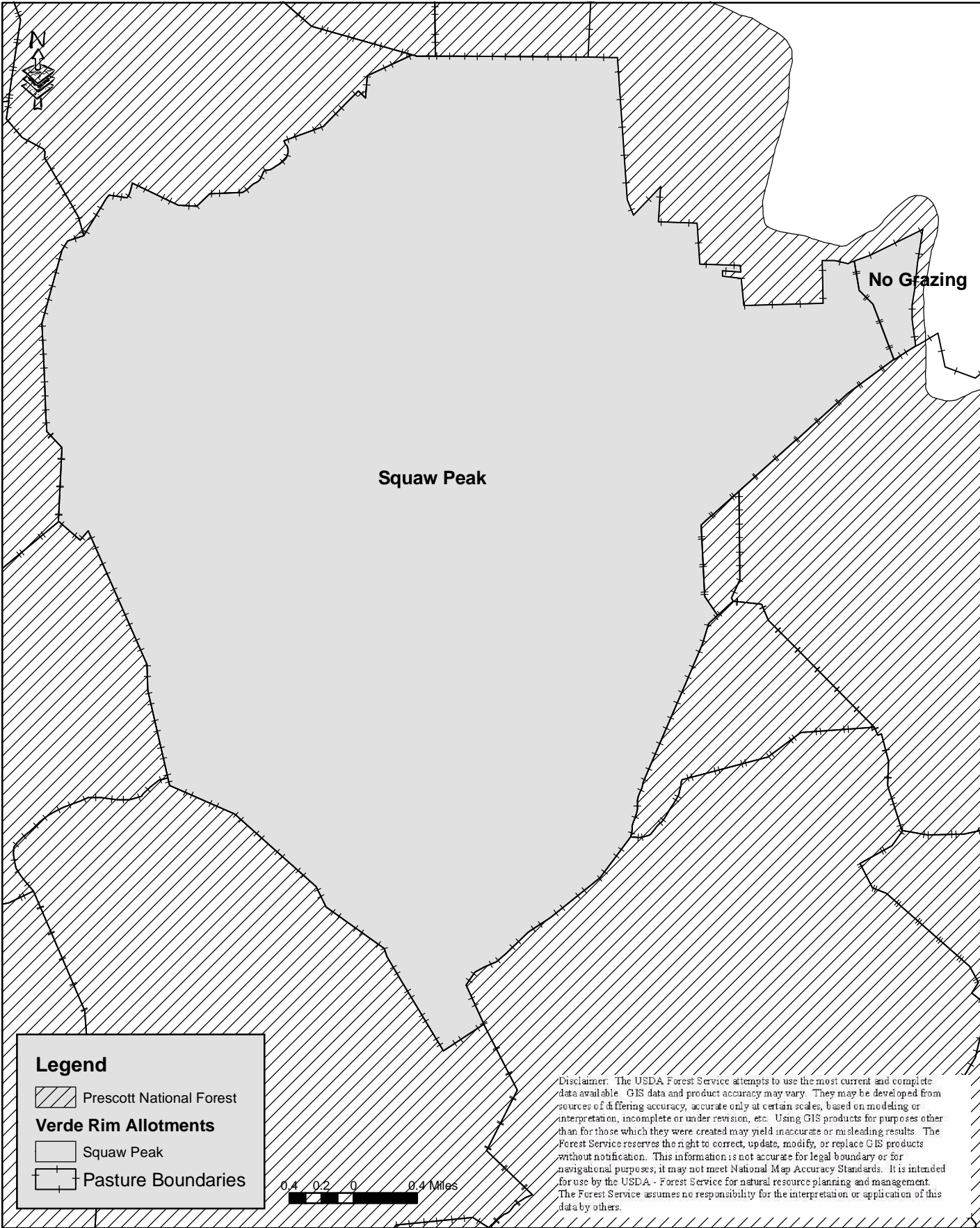


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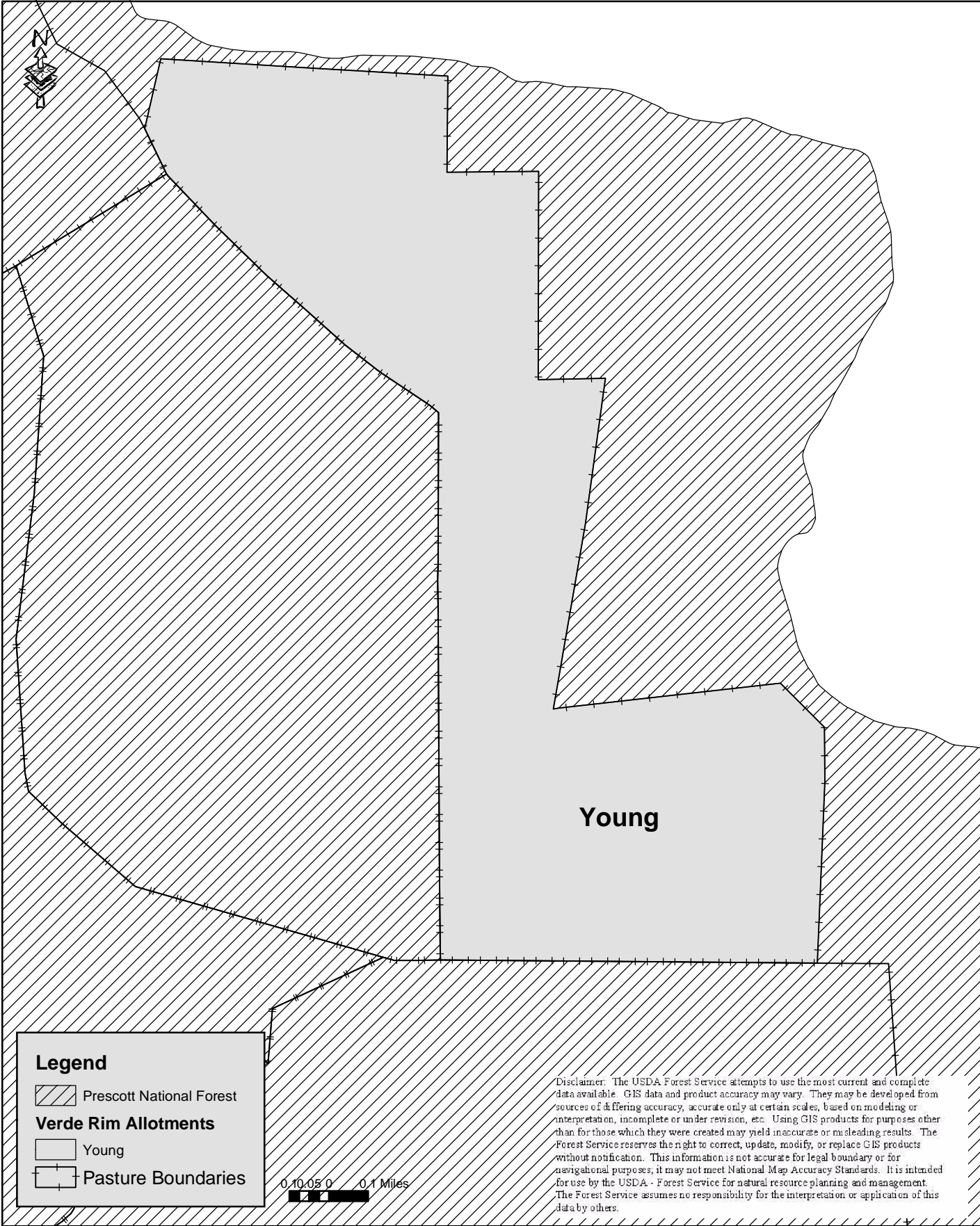
- Prescott National Forest
- Verde Rim Allotments**
- Copper Canyon
- Pasture Boundaries

Disclaimer: The USDA Forest Service attempts to use the most current and complete data available. GIS data and product accuracy may vary. They may be developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete or under revision, etc. Using GIS products for purposes other than for those which they were created may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. This information is not accurate for legal boundary or for navigational purposes; it may not meet National Map Accuracy Standards. It is intended for use by the USDA - Forest Service for natural resource planning and management. The Forest Service assumes no responsibility for the interpretation or application of this data by others.

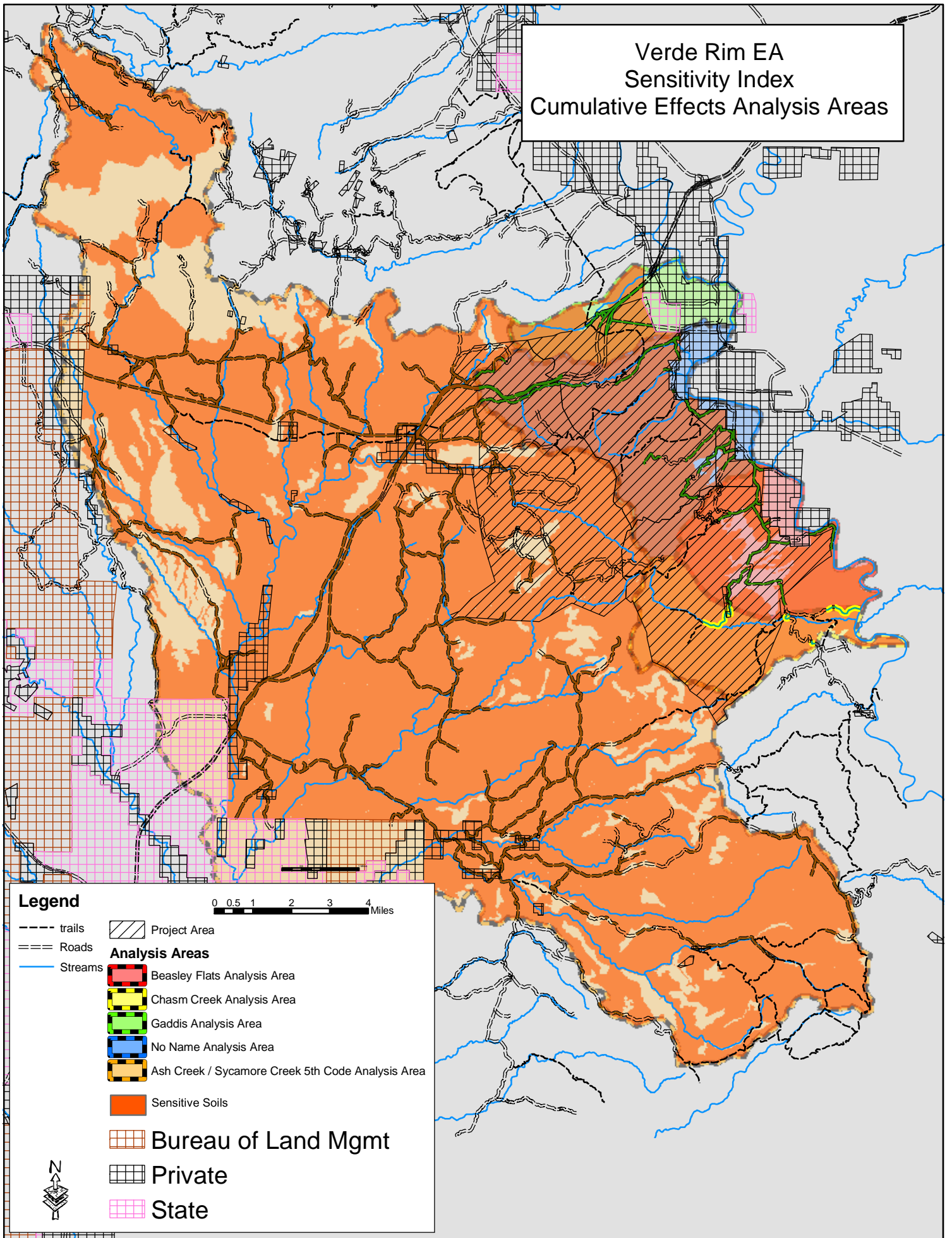
Squaw Peak Allotment



Young Allotment



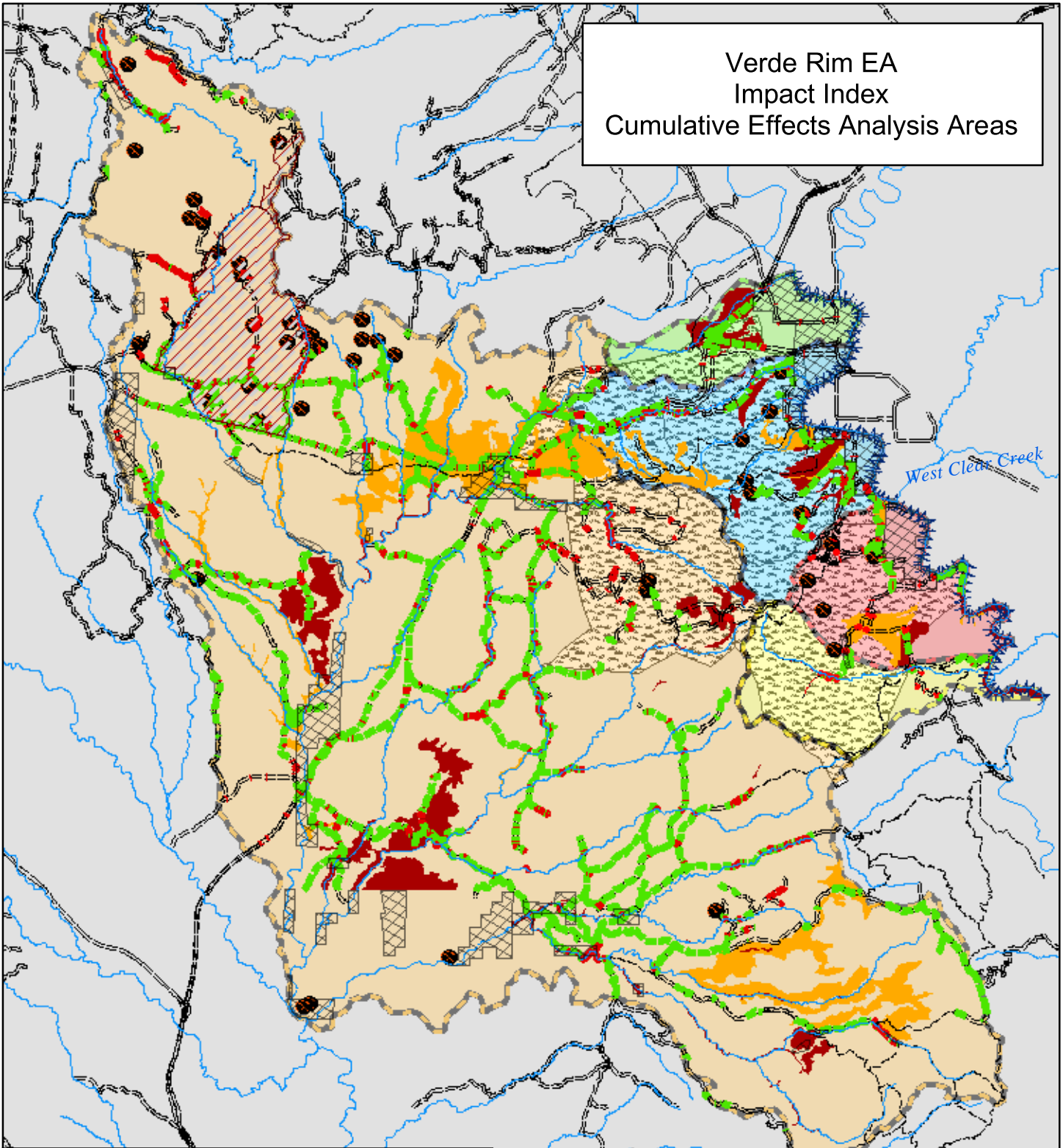
Verde Rim EA Sensitivity Index Cumulative Effects Analysis Areas



Legend

- trails
- Roads
- Streams
- Project Area
- Analysis Areas**
- Beasley Flats Analysis Area
- Chasm Creek Analysis Area
- Gaddis Analysis Area
- No Name Analysis Area
- Ash Creek / Sycamore Creek 5th Code Analysis Area
- Sensitive Soils
- Bureau of Land Mgmt
- Private
- State

Verde Rim EA Impact Index Cumulative Effects Analysis Areas



Legend

- Streams
- Cherry Incident
- Trails In Stream Buffer
- trails
- Roads In Stream Buffer
- Mines
- Roads
- Roads on Sensitive Soils
- Impaired Verde River
- Project Area
- Ash Creek / Sycamore Creek 5th Code Analysis Area
- CE_h2o_cuts**
- Analysis Areas**
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- Chasm Creek Analysis Area
- Gaddis Analysis Area
- No Name Analysis Area
- OWNER**
- Private (Portions of Polygon Display Development Impacts)

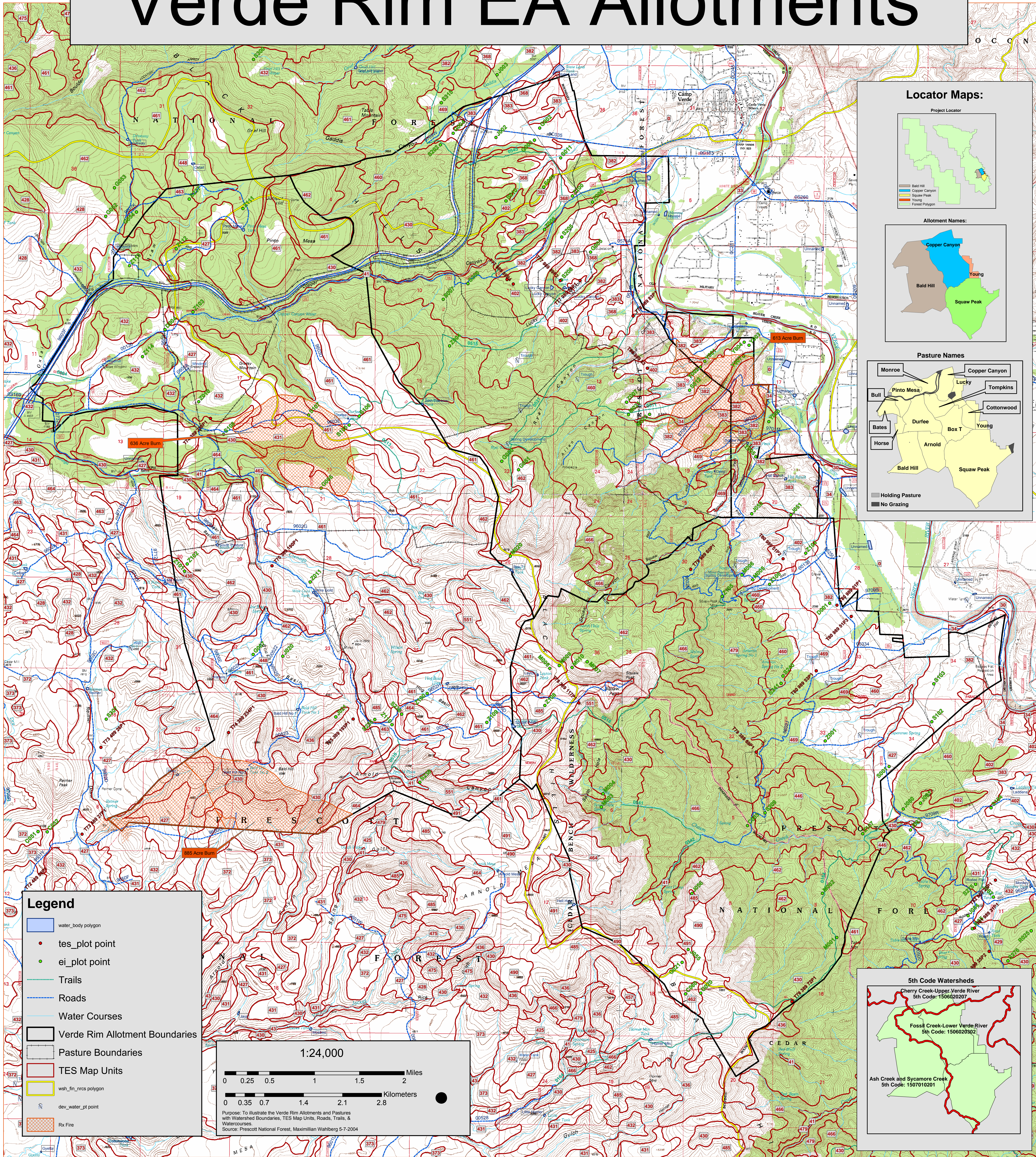


Purpose: This map illustrates impacts discussed in the Impact Index for the Verde Rim Livestock Grazing EA

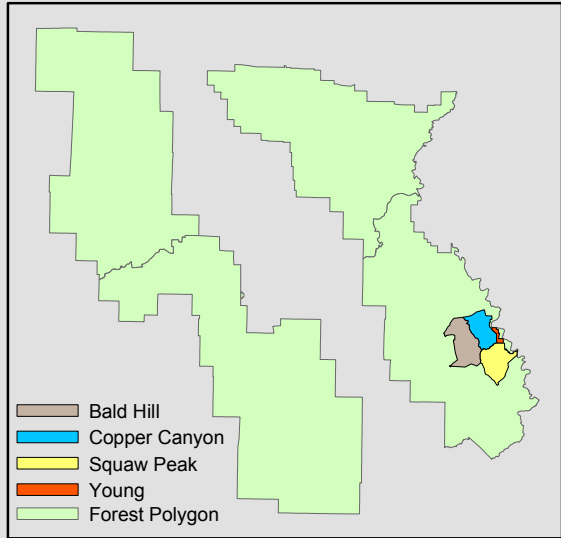
Disclaimer: The USDA Forest Service attempts to use the most current and complete data available. GIS data and product accuracy may vary. They may be developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete or under revision, etc. Using GIS products for purposes other than those for which they were created may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify or replace GIS products without notification. This information is not accurate for legal boundary or for navigational purposes; it may not meet National Map Accuracy Standards. It is intended for use by the USDA – Forest Service for natural resource planning and management. The Forest Service assumes no responsibility for the interpretation or application of this data by others. For more information contact the office which produced the data or map.

Source: Prescott National Forest, S.O. 9-22-2004

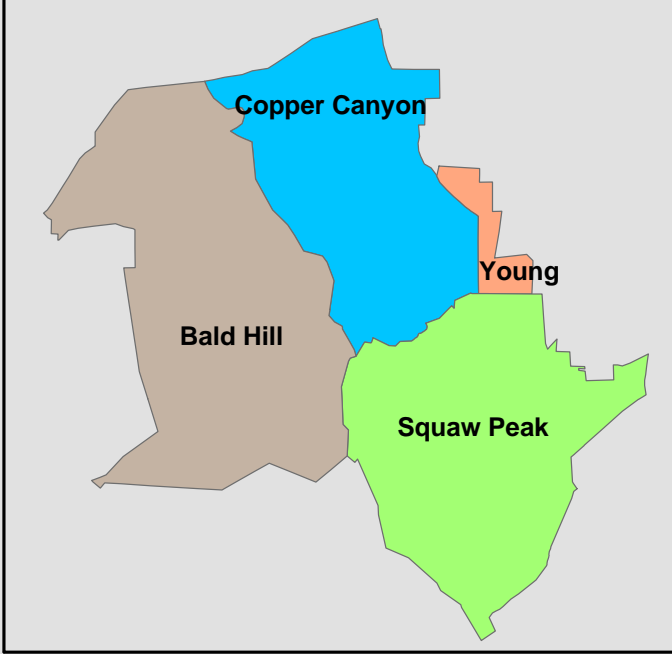
Verde Rim EA Allotments



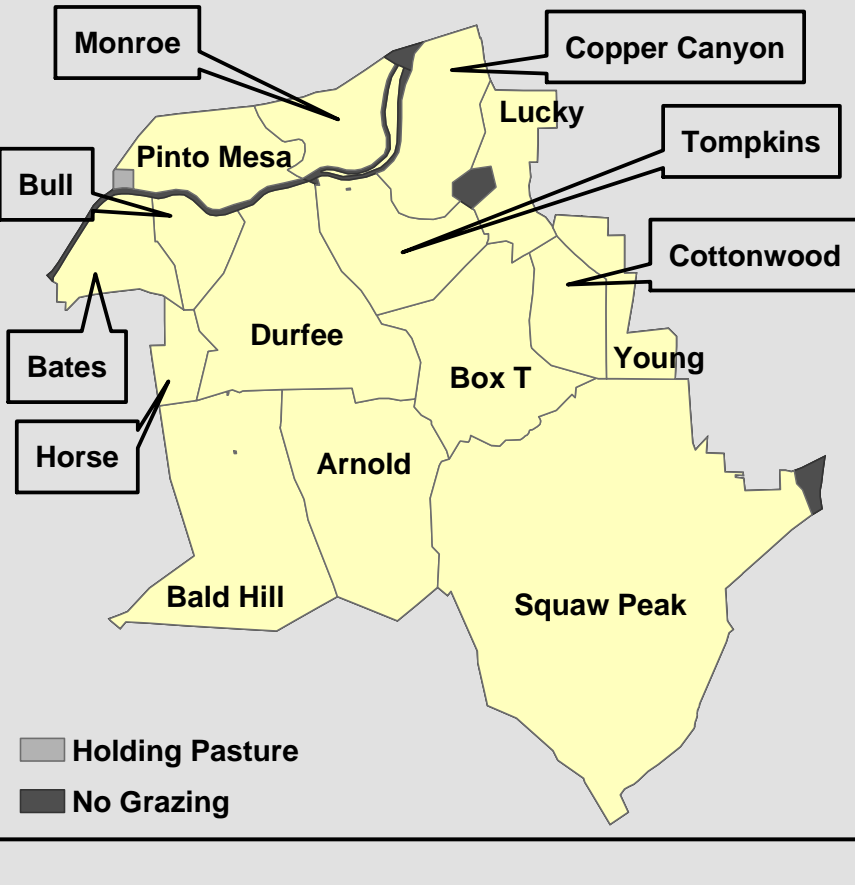
Locator Maps:



Allotment Names:

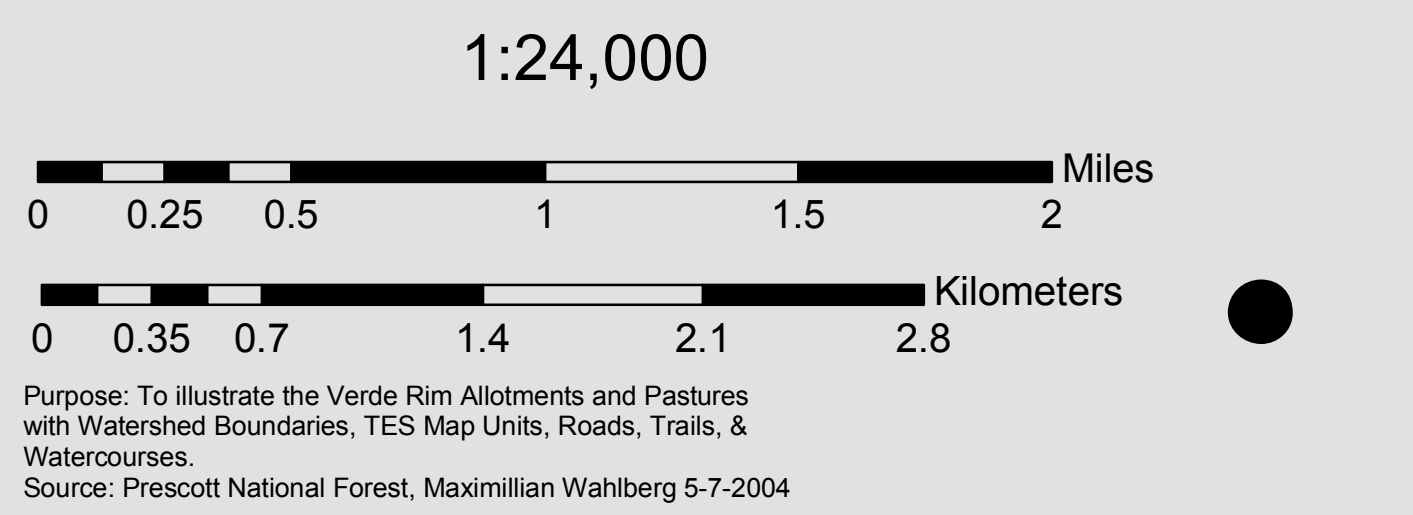


Pasture Names

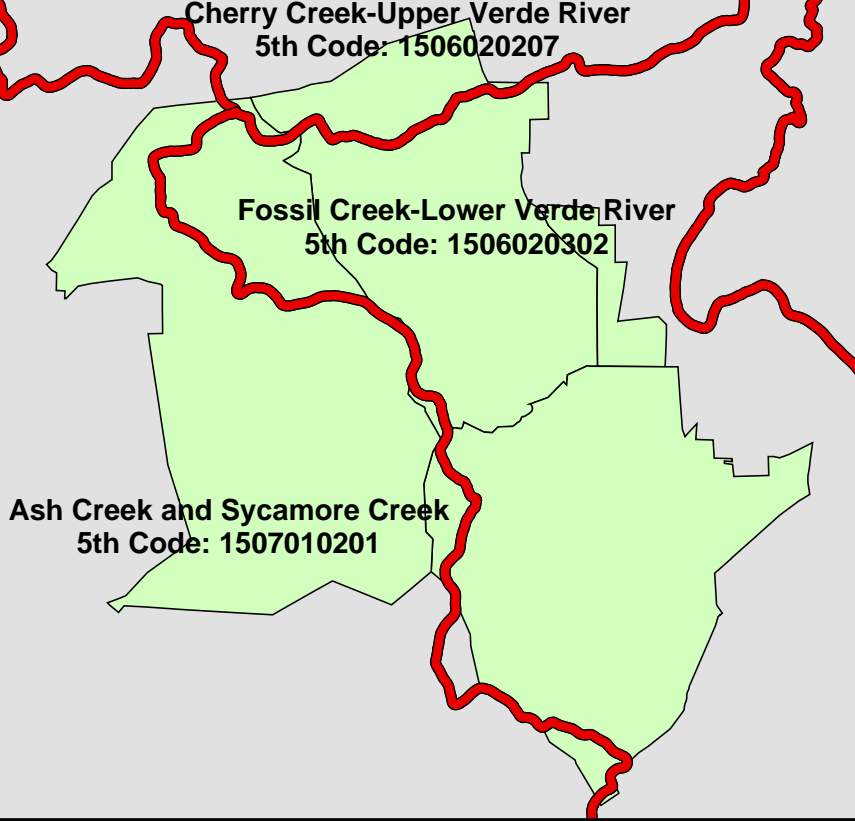


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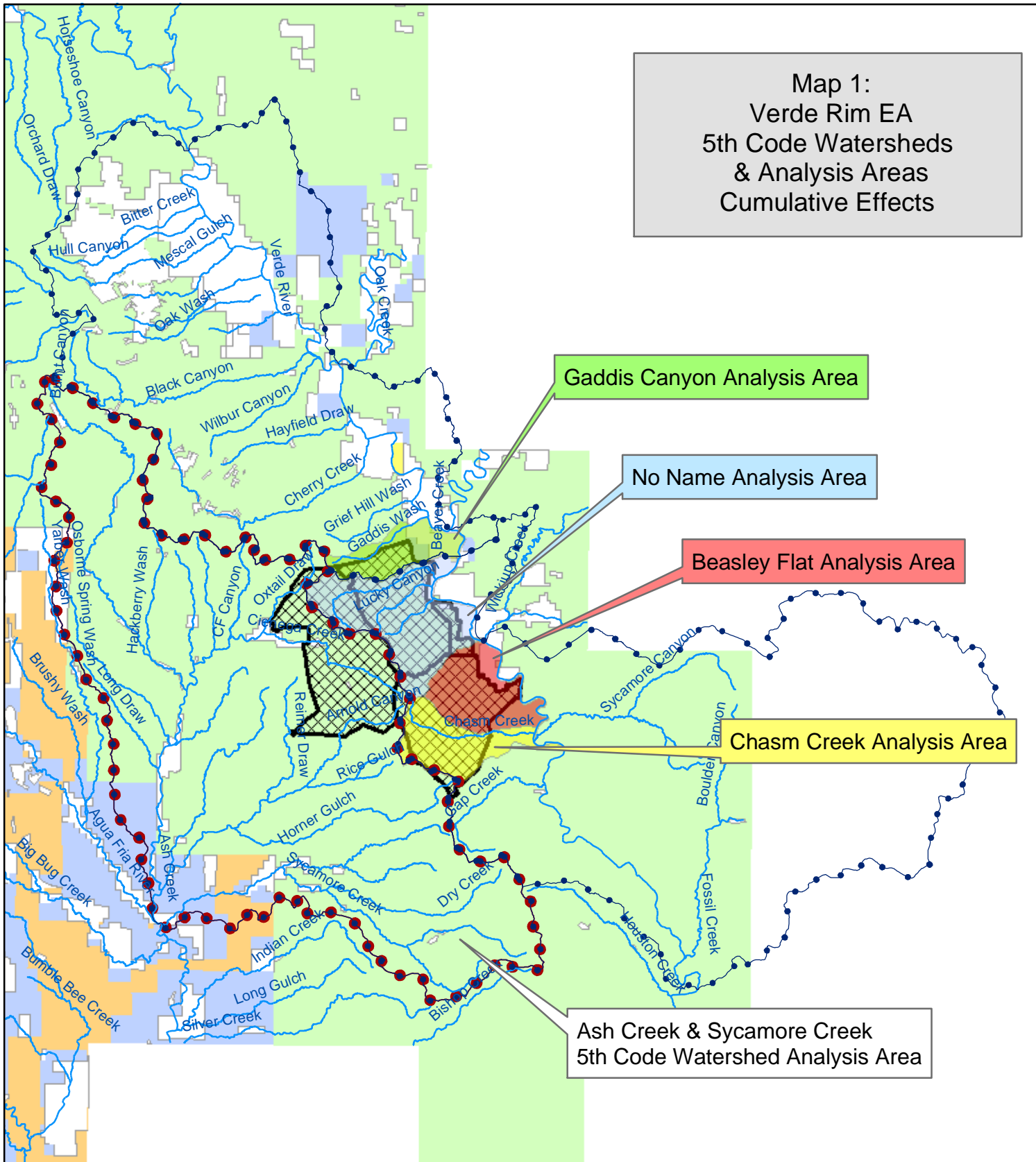
- water_body polygon
- tes_plot point
- ei_plot point
- Trails
- Roads
- Water Courses
- Verde Rim Allotment Boundaries
- Pasture Boundaries
- TES Map Units
- wsh_fin_nrcs polygon
- ⊙ dev_water_pt point
- Rx Fire



5th Code Watersheds



Map 1:
Verde Rim EA
5th Code Watersheds
& Analysis Areas
Cumulative Effects



Gaddis Canyon Analysis Area

No Name Analysis Area

Beasley Flat Analysis Area

Chasm Creek Analysis Area

Ash Creek & Sycamore Creek
5th Code Watershed Analysis Area

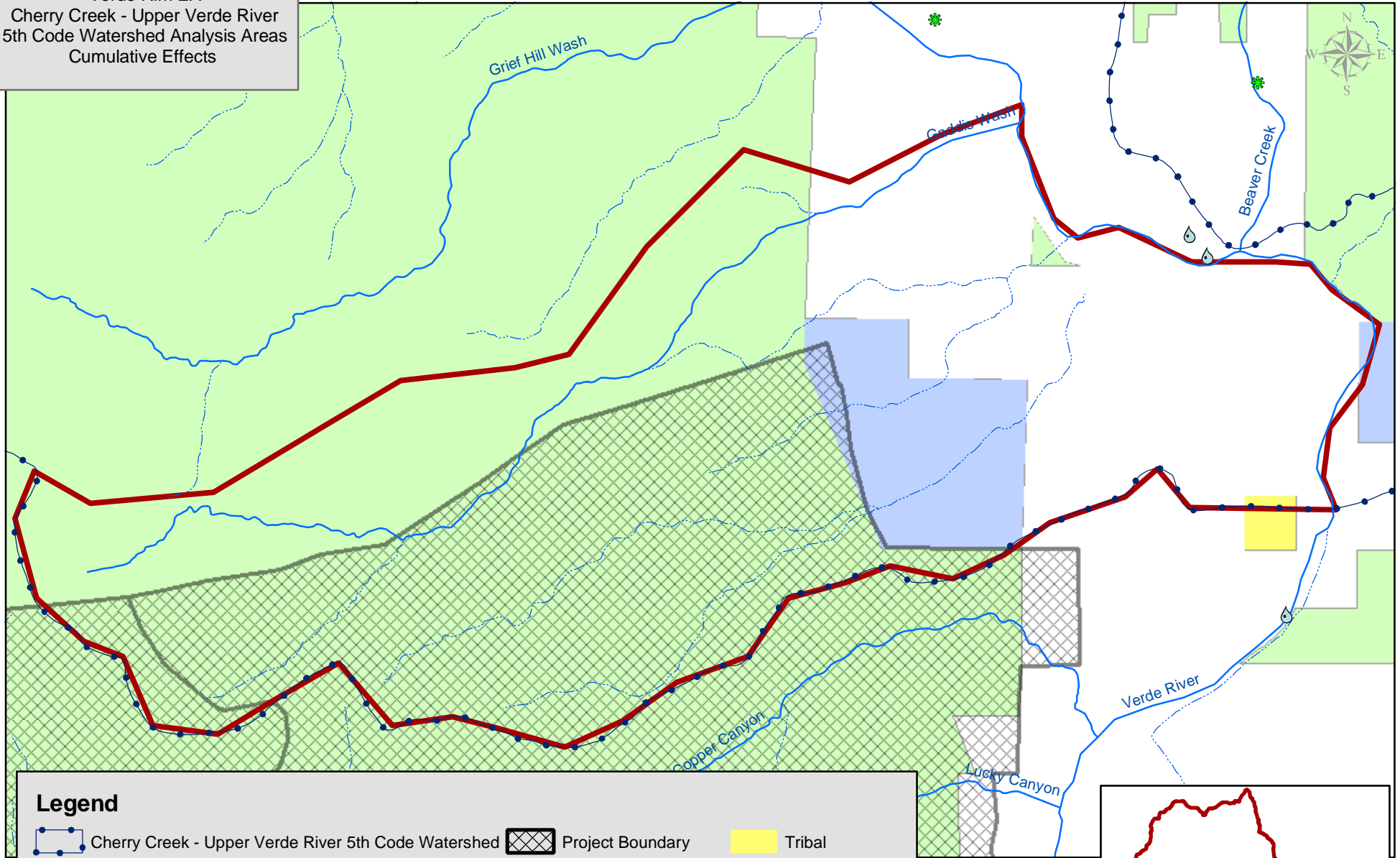
Legend

Major Streams	OWNER
Ash Creek & Sycamore Creek 5th Code Watershed Analysis Area	Bureau of Land Mgmt
Analysis Areas:	Tribal
Beasley Flats Analysis Area	National Forest
Chasm Creek Analysis Area	Private
Gaddis Analysis Area	State
No Name Analysis Area	5th Code Watershed Boundaries
Project Boundary	











5 2.5 0 5 Miles




Map 2:
Verde Rim EA
Cherry Creek - Upper Verde River
5th Code Watershed Analysis Areas
Cumulative Effects

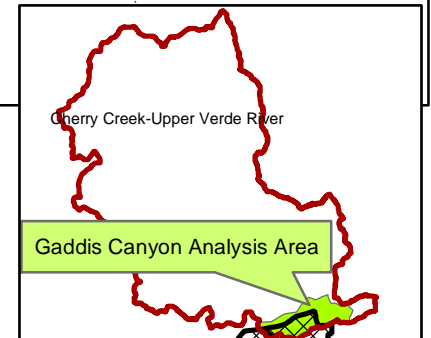
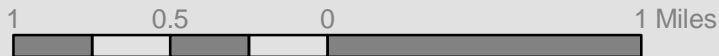


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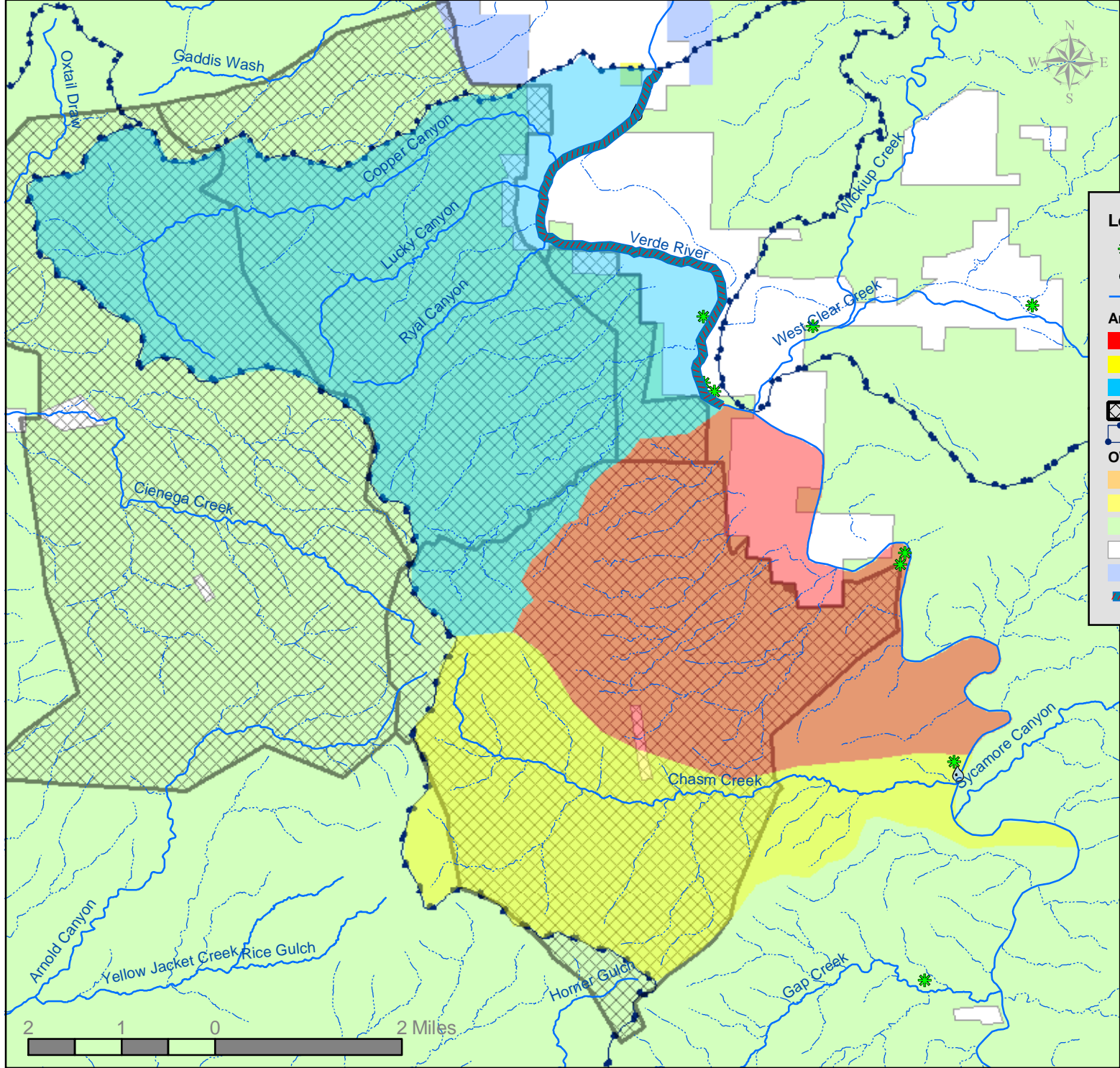
-  Cherry Creek - Upper Verde River 5th Code Watershed
-  Surface Water Monitoring Sites
-  USGS Monitoring Sites
-  Major Streams
-  Project Boundary
- OWNER**
-  Bureau of Land Mgmt
-  National Forest
-  Private
-  State
-  Tribal

NAME

-  Gaddis Analysis Area



Map 3:
Verde Rim EA
Cherry Creek - Upper Verde River
5th Code Watershed Analysis Areas
Cumulative Effects



Legend

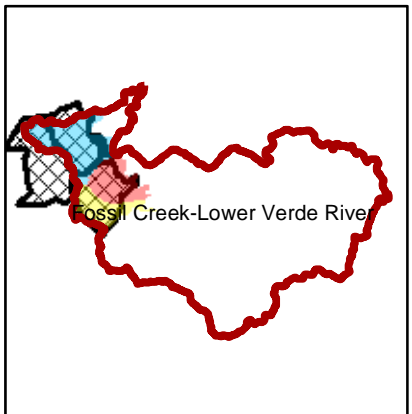
- Surface Water Monitoring Sites
- USGS Monitoring Sites
- Major Streams

Analysis Areas

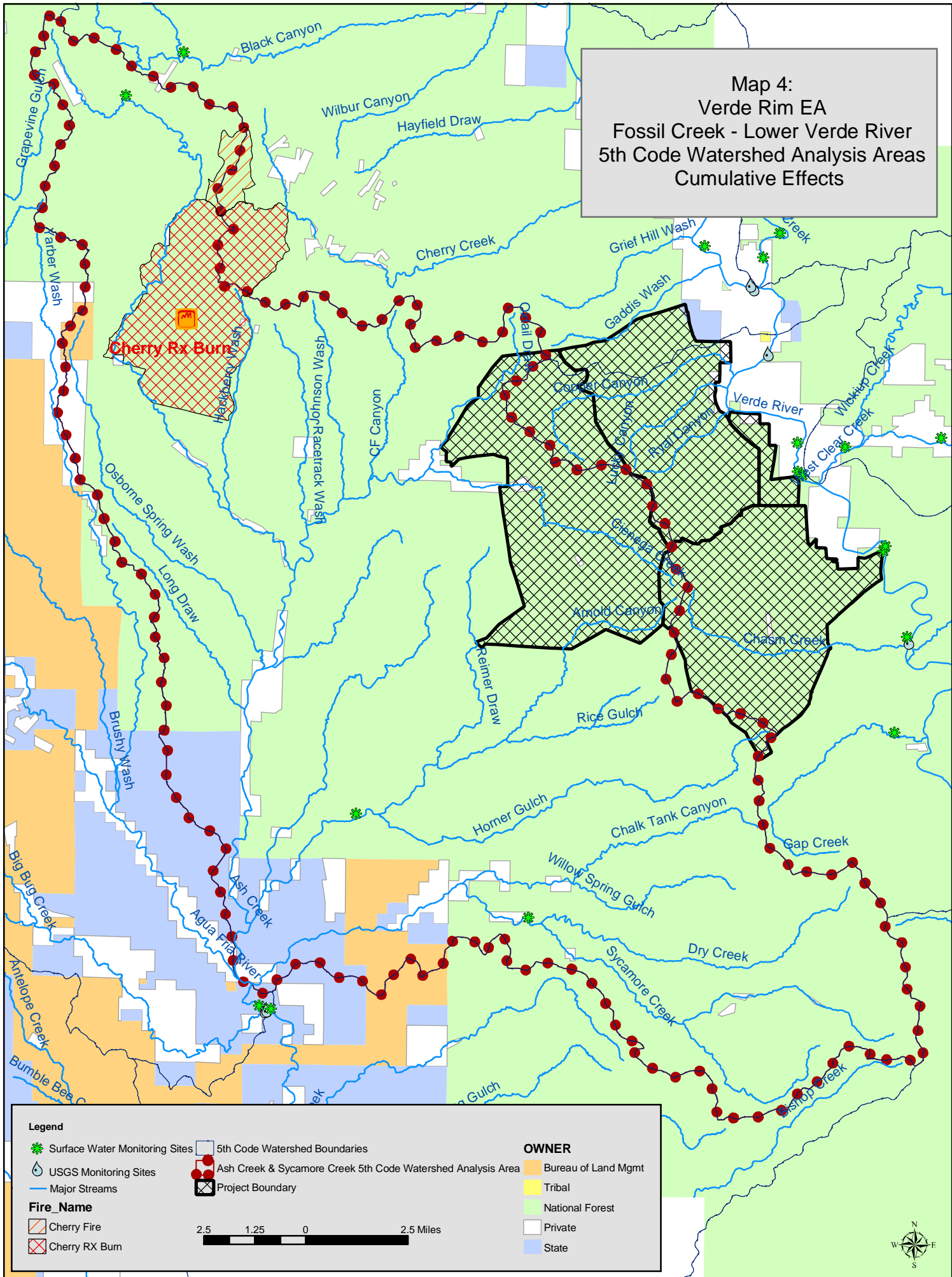
- Beasley Flats Analysis Area
- Chasm Creek Analysis Area
- No Name Analysis Area
- Project Boundary
- 5th Code Watershed Boundaries

OWNER

- Bureau of Land Mgmt
- Tribal
- National Forest
- Private
- State
- Impaired Section of the Verde River



Map 4:
Verde Rim EA
Fossil Creek - Lower Verde River
5th Code Watershed Analysis Areas
Cumulative Effects



Legend

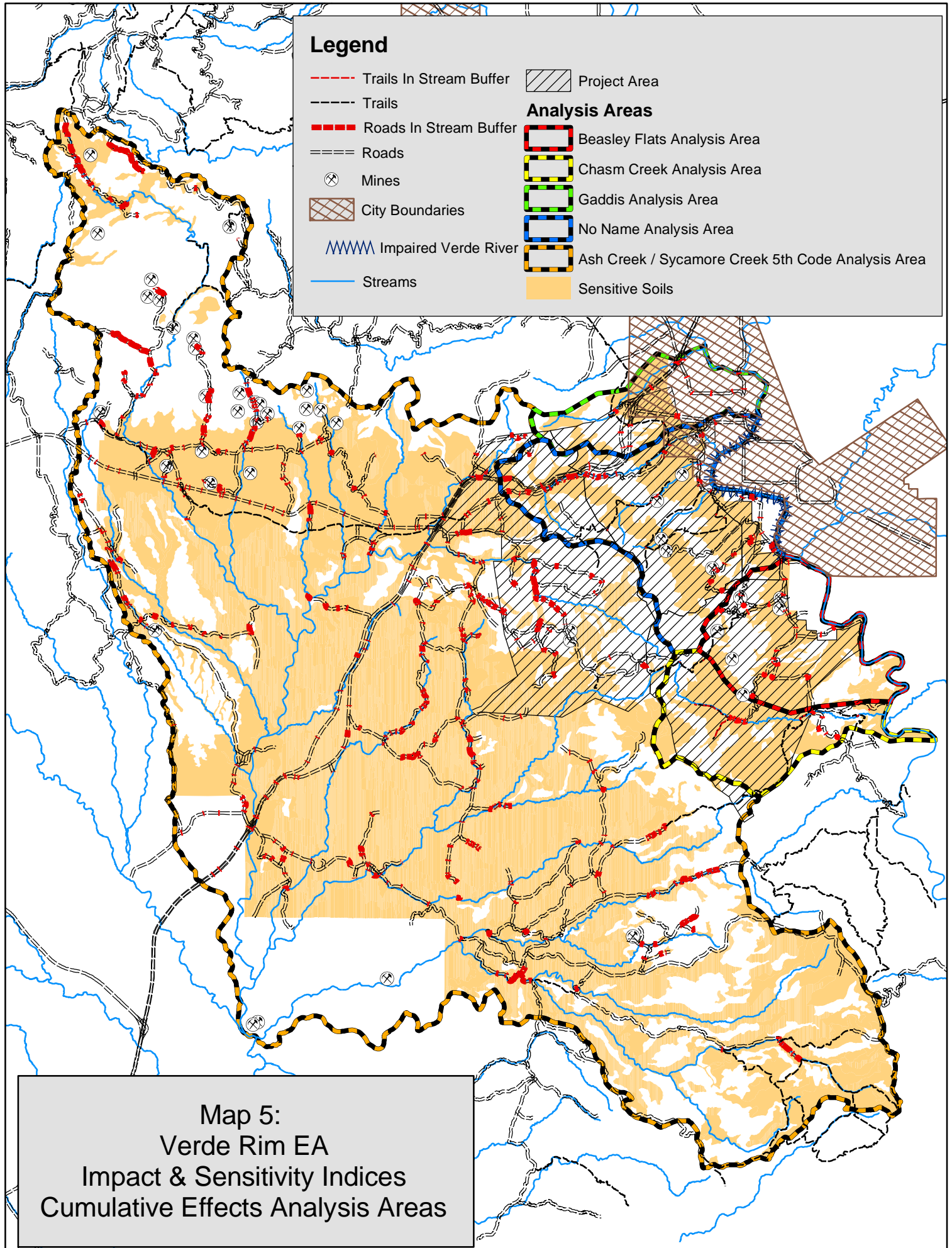
- Surface Water Monitoring Sites
- USGS Monitoring Sites
- Major Streams
- Cherry Fire
- Cherry RX Burn
- 5th Code Watershed Boundaries
- Ash Creek & Sycamore Creek 5th Code Watershed Analysis Area
- Project Boundary

OWNER

- Bureau of Land Mgmt
- Tribal
- National Forest
- Private
- State

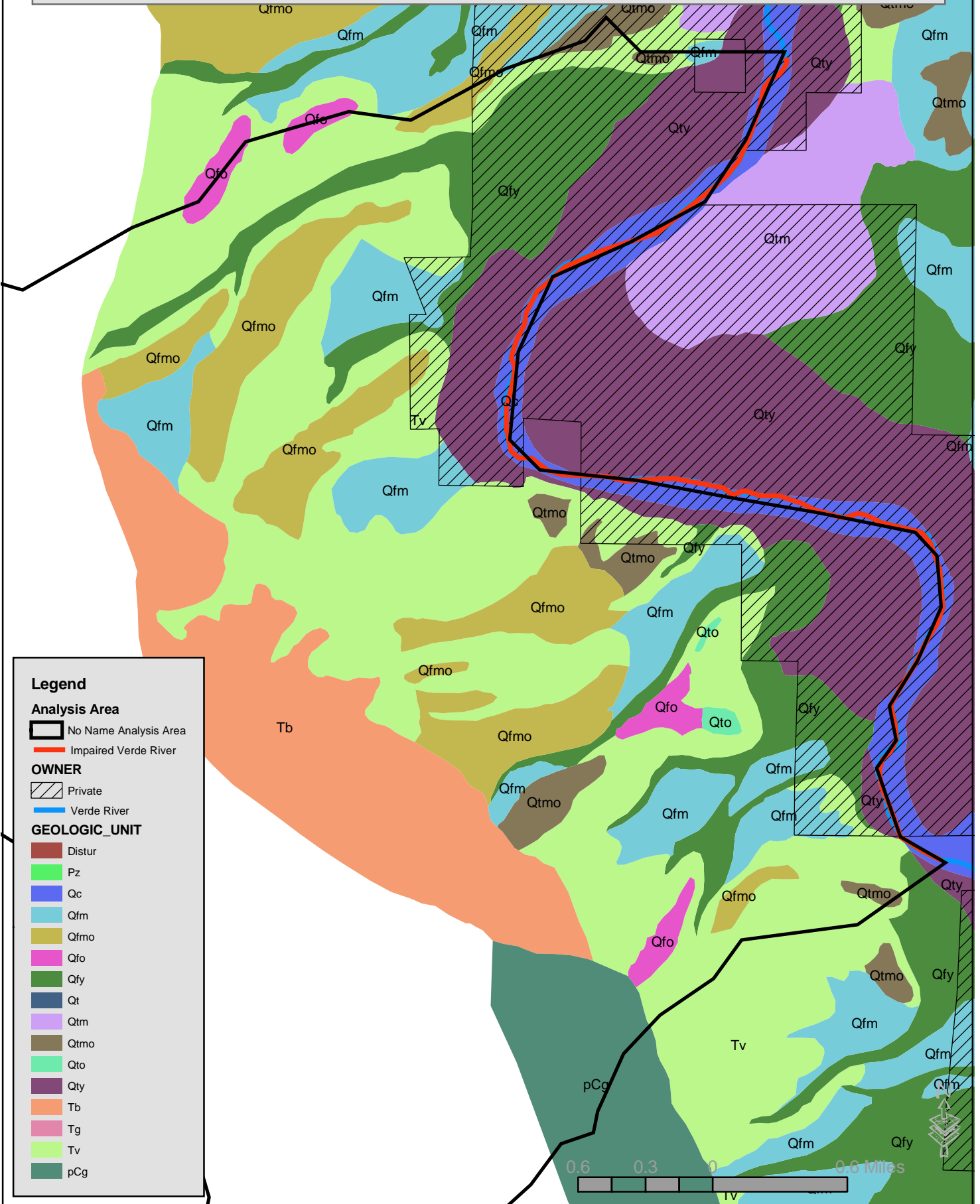
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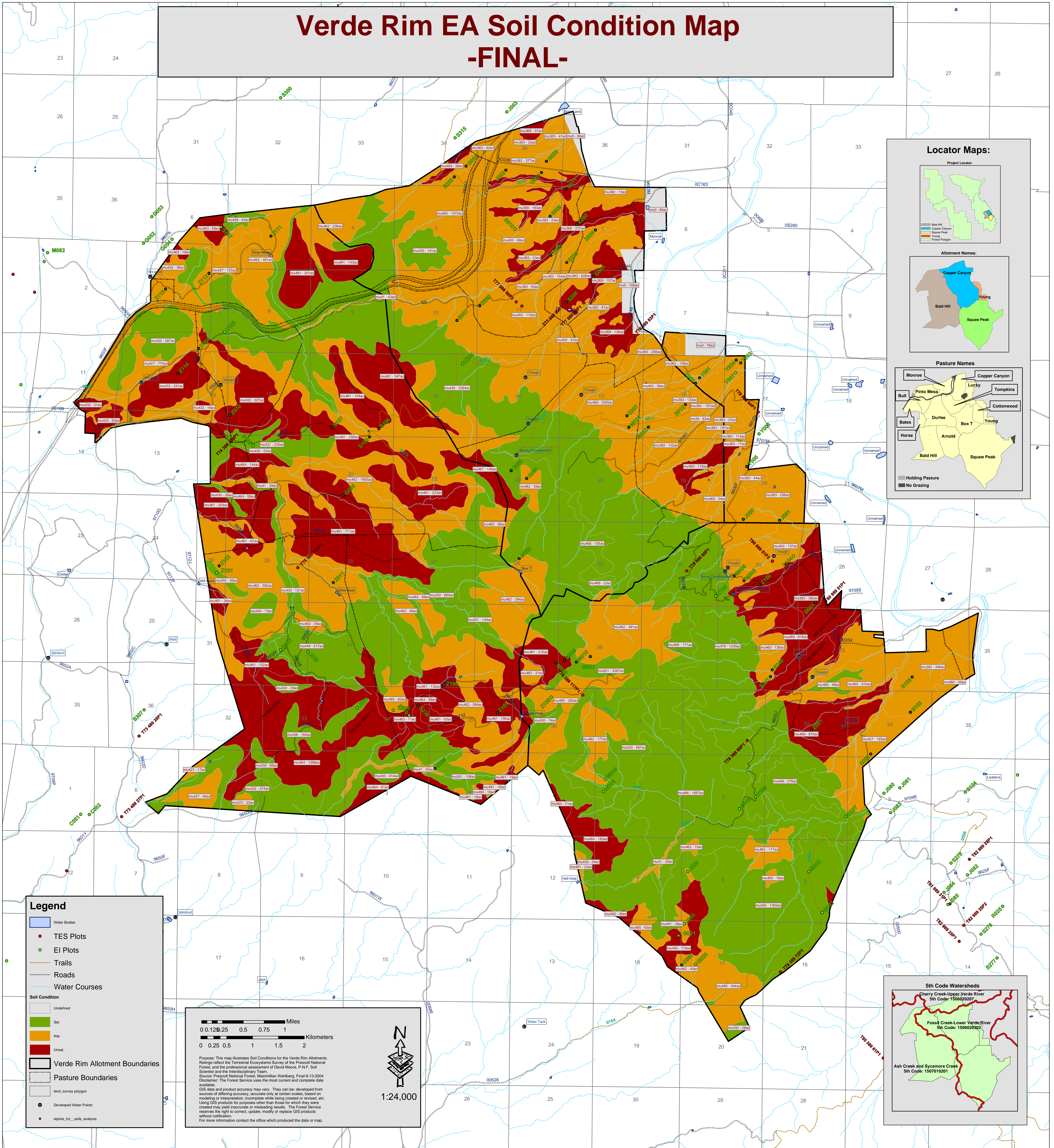
Map 5:
Verde Rim EA
Impact & Sensitivity Indices
Cumulative Effects Analysis Areas

Map 6: No Name Analysis Area Arizona Geologic Survey Mapping Units



Verde Rim EA Soil Condition Map

-FINAL-



Locator Maps:

Project Locator

Allotment Names:

Pasture Names

Legend for Pasture Names:
 Holding Pasture (Yellow)
 No Grazing (Red)

Legend

- Water Bodies
- TES Plots
- EI Plots
- Trails
- Roads
- Water Courses
- Soil Condition
 - Undefined
 - Sat.
 - Imp.
 - Unsat.
- Verde Rim Allotment Boundaries
- Pasture Boundaries
- land_survey polygon
- Developed Water Points
- plots_for_soils_analysis

Scale: 0 0.125 0.25 0.5 0.75 1 Miles

Scale: 0 0.25 0.5 1 1.5 2 Kilometers

Scale: 1:24,000

Purpose: This map illustrates Soil Conditions for the Verde Rim Allotments. Ratings reflect the Terrestrial Ecosystems Survey of the Prescott National Forest, and the professional assessment of David Moore, P.N.F. Soil Scientist and the Interdisciplinary Team.

Source: Prescott National Forest, Maximilian Wahlberg, Final-9-13-2004

Disclaimer: The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. They can be developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for purposes other than those for which they were created may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify or replace GIS products without notification.

For more information contact the office which produced the data or map.

5th Code Watersheds

Cherry Creek-Upper Verde River
5th Code: 1506020207

Fossil Creek-Lower Verde River
5th Code: 1506020302

Ash Creek and Sycamore Creek
5th Code: 1507010201

Verde Rim EA Vegetative Types of the Verde Rim

Legend

- Water Body Polygons
- Developed Water Points
- Trails
- Roads
- Water Courses
- Pasture Boundaries
- Verde Rim Allotment Boundaries

vr_veg_type_dissolve

Veg_type

- Barren-Juos
- Caho3/Juer/Boer4/Hene5-Prve/Boer4/Hene5
- Chli2/Prve-Prve/Acgr
- Jude2/Bogr2
- Jude2/Quar/Cemo2/Bogr2
- Juos-Barren
- Juos/Plmu3
- Juos/Prve/Caho3/Hene5-Juos/Prve/Caho3/Plmu3
- Juos/Prve/Hibe-Juos/Prve/Plmu3
- Juos/Prve/Plmu3
- Juos/Qutu2
- Juos/Qutu2/Hibe
- Pied/Juos/Pust/Hene5-Pied/Juos/Cemo2/Hene5
- Pifa/Jude2/Juos/Qutu2-Barren
- Pifa/Jude2/Juos/Qutu2-Jude2/Juos/Bogr2
- Pifa/Juos/Qutu2
- Pifa/Juos/Qutu2/Hene5-Juos/Caho3/Hene5
- Plmu3/Paob
- Plwr2/Pofr2/Frve2-Plwr2/Frve2/Sala3-Barren
- Prfr2/Plwr2/Saex-Barren
- Private or Water
- Prve/Atca2/Plmu3/Poab-Prve/Atca2/Spai-/Plmu3/Hene5
- Prve/Caho3/Boer4/Hene5-Prve/Plmu3
- Qutu2/Arpu5
- Qutu2/Cemo2-Barren
- Qutu2/Cemo2-Quga/Rone-Barren

