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# **Environmental Assessment for Sycamore Livestock Grazing Project**

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

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**ENVIRONMENTAL ASSESSMENT  
SYCAMORE LIVESTOCK GRAZING PROJECT  
VERDE RANGER DISTRICT  
YAVAPAI COUNTY, ARIZONA**

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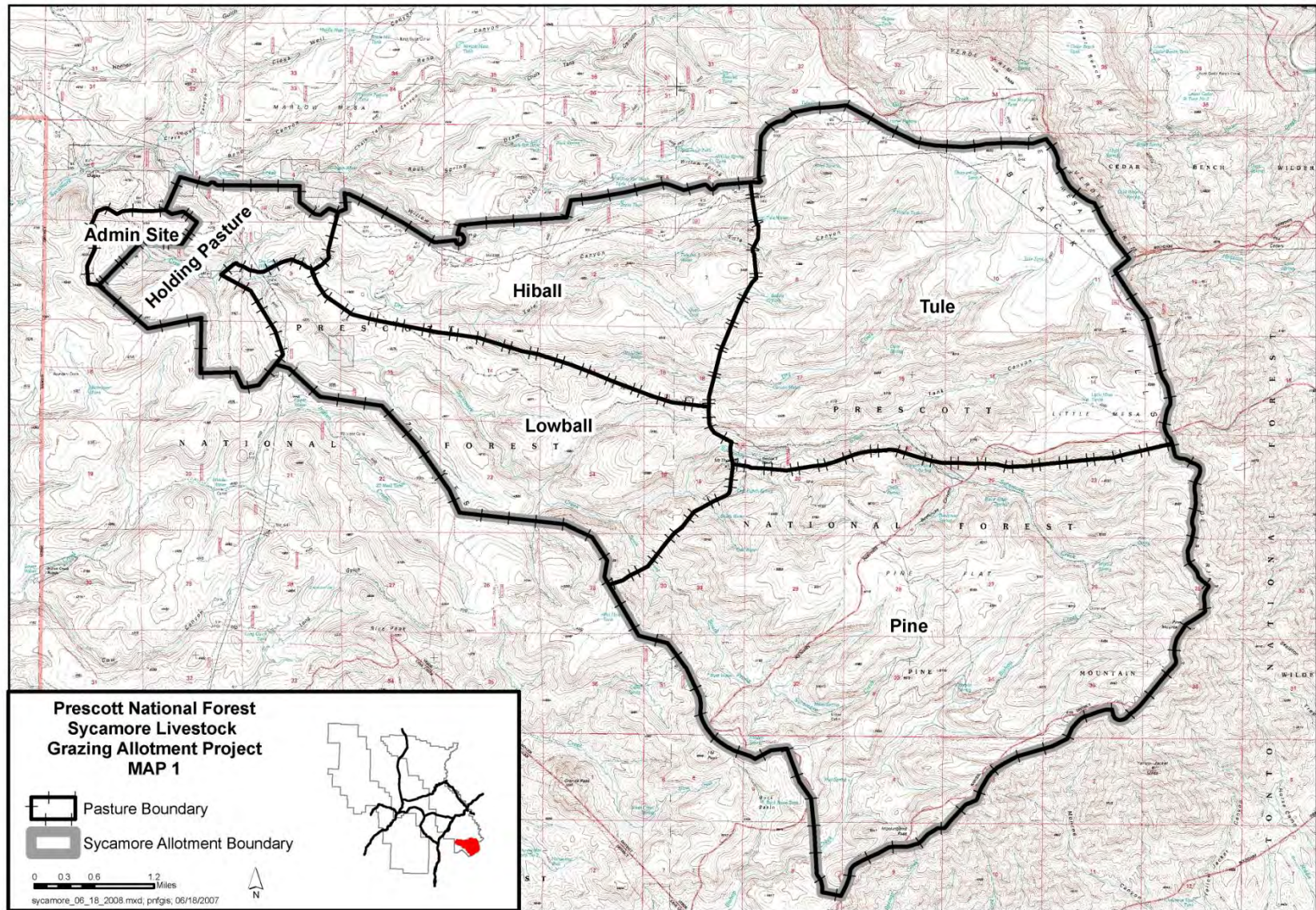


Figure 1. Sycamore Allotment general vicinity map



## Abbreviations and Acronyms

ADEQ- Arizona Department of Environmental Quality  
AGFD- Arizona Game and Fish Department  
AMP- Allotment Management Plan  
AOI- Annual Operating Instructions  
AUM – Animal Unit Month  
BMP – Best Management Practices  
CE- Categorical Exclusion  
CEQ- Council on Environmental Quality  
CFR- Code of Federal Regulations  
CT- Community Type  
DN- Decision Notice  
EA – Environmental Assessment  
EIS- Environmental Impact Statement  
ESA – Endangered Species Act  
ET – Ecological Type  
FR- Forest Road  
FS – Forest Service  
FSH- Forest Service Handbook  
FSM- Forest Service Manual  
FT- Forest Trail  
FONSI – Finding of No Significant Impact  
IBA – Important Bird Area  
IDT – Interdisciplinary Team  
MIS- Management Indicator Species  
NEPA- National Environmental Policy Act  
PCE- Primary Constituent Element  
PFC- Proper Functioning Condition  
PRIMM - Prescott Inventory and Monitoring Methodology  
PU- Production Utilization  
ROS- Recreation Opportunity Spectrum  
TES- Terrestrial Ecosystem Survey  
USFWS- United States Fish and Wildlife Service  
USDA- United States Department of Agriculture  
USDOI- United States Department of Interior

## Document Structure

The Prescott National Forest has prepared this EA to evaluate the potential effects of authorizing livestock grazing on the Sycamore Allotment, and to “briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact” (40 CFR 1508.9(a)(1)). This EA has been prepared pursuant to the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Part 1500) the Forest Service NEPA procedures (36 CFR part 220), and Forest Service Handbook 1909.15—Environmental Policy and Procedures Handbook (USDA 2008a). This EA discloses the direct, indirect, and cumulative environmental impacts that would result from the modified proposed action and no action alternative.

Additional documentation, including more detailed analyses of project-area resources, is included in the project planning record. The project planning record is available for public review pursuant to the Freedom of Information Act (5 U.S.C. 552), and will be located at the Verde Ranger District in Camp Verde, Arizona. The document is organized into four chapters and includes references and appendices:

- Chapter 1 – Purpose and Need: The section includes information on the history of the project proposal, the purpose of and need for the project, desired conditions, and the agency’s proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- Chapter 2 - Alternatives: This section provides a more detailed description of the no action alternative, as well as the agency’s modified proposed action for achieving the stated purpose. The no action alternative is required per the Region 3 supplement to the FSH 2209.13 – Grazing Permit Administration Handbook, Chapter 90, section 92.31. The modified proposed action was developed based on issues raised by the public and other agencies. This section also includes a discussion on possible mitigation measures.
- Chapter 3 - Environmental Consequences: This section describes the affected environment and environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource. Within each section, the affected environment is described first, followed by the effects of the no action alternative that provides a baseline for evaluation and comparison of the modified proposed action that follows.
- Chapter 4 – Consultation and Coordination: This section provides a list of agencies consulted during the development of the environmental assessment, as well as a list of preparers.
- References, abbreviations and acronyms, and a glossary: These sections provide more information about project and helpful tools.
- Appendices: The appendices provide more detailed information to support the analyses presented in the environmental assessment.

# Chapter 1 – Purpose and Need

## Introduction

The Sycamore Livestock Grazing Project is located on the Verde Ranger District, Prescott National Forest (Figure 1). The project area is situated along the southeast boundary of the forest around the small unincorporated community of Dugas. The legal description for the Sycamore Allotment is Township (T)10, 11N, Range (R) 2, 3, 4 E, Gila and Salt River Meridian. The Sycamore Allotment consists of approximately 28,118 acres of Prescott National Forest lands within the northern reaches of the Agua Fria Grasslands. While there is private land within the analysis area, this action is limited to activities on the National Forest System lands. The current permittee owns 3 parcels – T Anchor Ranch (residential and agriculture); Graveyard spring; and Double T Ranch – all part of the allotment operation. The only other private land parcel is Nelson Place Spring in T.11N, R.5E Sec. 21 and 22. Other land uses in the area are primarily recreational uses such as hunting, dispersed camping, and wilderness travel.

## *Current Livestock Management*

The Sycamore Allotment is a year-round allotment, meaning cattle are grazed on some part of the allotment at any given time of year. Since 2003, the allotment has been operating as a 4-pasture, one herd, rotation (deferred/rest) grazing system. The current season of use is yearlong. Allotment pastures and acreages are summarized in Table 1.

**Table 1. Sycamore Allotment pastures**

<b>Pasture</b>	<b>Acreage</b>
<b>Pine</b>	10,302
<b>Loball</b>	4,082
<b>Hiball</b>	3,966
<b>Tule</b>	8,199
<b>Holding</b>	1,569
<b>TOTAL</b>	<b>28,118</b>

Note: Acreage is approximate and does not include private land

## *Project History*

This environmental analysis process was formally initiated by the Verde District Ranger, (Deciding Officer), with a project initiation letter dated December 12, 2006. An Interdisciplinary Team (IDT) comprised of Forest Service resource specialists were selected based on current uses and anticipated concerns. The IDT developed a proposal for managing rangeland use on the allotments, and in December 2006 mailed a public scoping letter and project information to solicit comments on the proposed Sycamore/Willow/V-Bar Livestock Grazing Project to authorize continued livestock grazing on the Sycamore, Willow, and V-Bar Allotments. This scoping letter proposed excluding this action from documentation in an environmental impact statement (EIS) or EA per the categorical exclusion (CE) provision of Section 399 of the Consolidated Appropriations Act, 2005 (PL 108-447). The Willow and V-Bar proposed actions were handled under this CE authority and subsequent decision memos were signed in 2005.

The Sycamore Allotment contains occupied habitat and designated critical habitat for the Gila chub (an endangered fish) along Sycamore Creek (USDI 2005b). Due to concerns associated with Gila chub, the Sycamore Allotment did not qualify for use of the CE.

On June 23, 2008 the Verde Ranger District sent out a public scoping letter and project information to solicit comments on the proposed Sycamore Livestock Grazing Project. Based on public comment and additional field review, it was determined that the proposed action, as scoped, would not meet the purpose and need. For this reason, the proposed action was dropped from further detailed analysis.

A modified proposed action was developed after the July 2008 scoping period, and on November 24, 2008, a cover letter and Summary of the Environmental Assessment for the Sycamore Livestock Grazing Project was mailed to interested parties for a 30-day public comment period.

## Purpose and Need for Action

The Sycamore Allotment (project area) contains lands identified as suitable for domestic livestock grazing in the Forest Plan and continued domestic livestock grazing is consistent with the goals, objectives, standards and guidelines of the Forest Plan (USDA 1986a), as amended. There is a need for authorizing livestock grazing in a manner consistent with the Forest Plan.

Authorization of livestock grazing is needed on the Sycamore Allotment because:

- Where consistent with other multiple use goals and objectives, there is Congressional intent to allow grazing on suitable lands (Multiple Use Sustained Yield Act of 1960, Wilderness Act of 1964, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976, and 36 CFR 222.1 (a)).
- It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for grazing consistent with land management plans (FSM 2203.1; 36 CFR 222.2 (c)).
- It is Forest Service policy to continue contributions to the economic and social well-being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood (FSM 2202.1) (USDA 2005a).
- The Forest Service needs to comply in a timely manner with Section 504 (a) of the 1995 Rescission Act (Public Law 104-19) for completion of the NEPA analysis and decision on all grazing allotments.

This action responds to the goals and objectives outlined in the Forest Plan, and will help move the project area towards desired conditions described in that plan.

## Desired Conditions

The desired conditions listed below for the allotment area are based on the Forest Plan, Forest Service direction and State and Federal laws pertaining to natural resource management. Those desired conditions that originate from the forest plan have the page number of the plan listed in parentheses. Site-specific desired conditions have also been developed by the interdisciplinary (ID) team by terrestrial ecosystem survey (TES) map units and functional resource and are included below.

### *Vegetation Resource*

- Maintain areas with satisfactory soil, watershed and riparian conditions.

- Manage for diverse populations of vegetation.
- Manage resources to create or maintain at least 3 age-classes of woody riparian species with at least 10 percent of the woody plant cover in sprouts, seedlings and saplings where site potential exists (p. 31).
- Maintain riparian communities by providing water for wildlife and livestock away from sensitive areas (p. 31).
- Projects impacting riparian areas will be designed to protect the productivity and diversity of riparian-dependent resources. Emphasize protection of soil, water, vegetation, wildlife and fish resources (p. 30).
- Provide forage to grazing and browsing animals to the extent benefits are relatively commensurate with costs without impairing land productivity, in accordance with management area objectives (p. 12).

### ***Soils and Watershed Resource***

- Protect and improve the soil resource (p. 13).
- Cross-country travel by any vehicle is prohibited, with the following exception(s): Approved resource management activities (employees/permittees) (p. 19).
- Provide for long-term quality waterflow needs through improved management technology (p. 13).
- Manage livestock grazing to achieve soil and water protection objectives. Make use of cost effective range improvements and management techniques (p. 32).
- Give preference to riparian-dependent resources over other resources (p. 14).
- Improve all riparian areas and maintain in satisfactory condition (p. 14).

### ***Wildlife and Fisheries Resource***

- Manage for a diverse, well distributed pattern of habitats for wildlife populations and fish species in cooperation with states and other agencies (p. 13).
- Maintain and/or improve habitat for threatened or endangered species and work toward the eventual recovery and delisting of species through recovery plan implementation (p. 13).
- Integrate wildlife habitat management activities into all resource practices through intensive coordination (p. 13).
- Support the goals and objectives of the Arizona Wildlife and Fisheries Comprehensive Plan, as approved by the Southwestern Regional Forester and Director of the Arizona Game and Fish Department (p. 13).
- Gila chub and Sensitive species within Sycamore Creek are self sustaining and contribute to the overall recovery or conservation of the species within their ranges.
- Aquatic habitat, including Gila chub critical habitat, along Sycamore Creek provides diverse aquatic habitat structure, stable banks, and good riparian conditions, meets water quality standards, provides a natural flow pattern, and has low levels of non-native aquatic species.

## Proposed Action (Modified)

The modified proposed action is to continue existing livestock management actions on the Sycamore Allotment in a manner consistent with Forest Service policy and the Forest Plan.

Therefore, the Verde Ranger District, Prescott National Forest proposes to authorize livestock grazing on the Sycamore Allotment under the following terms and conditions that define the limits for the duration, intensity, frequency and timing of grazing:

**Duration:** Grazing would be permitted year-round on the allotment, but may be less in some years.

**Intensity:** Forage utilization on upland forage would be targeted at 30-40 percent in pastures used during the growing season. (Sufficient re-growth and plant recovery of grazed herbaceous forage plants is expected prior to the end of the growing season). Use in pastures during slow growth and the dormant season would be 41-50 percent. (Little to no re-growth of grazed herbaceous forage plants is expected prior to the end of the grazing season). Utilization on upland shrubs would be 50 percent of available leaders and utilization on riparian forage species would be 20 percent of current year's growth.

**Frequency and Timing:** Management systems on the Sycamore Allotment would continue to incorporate growing season deferral in order to provide for grazed plant recovery. Timing of pasture moves would be dictated by utilization monitoring and management objectives specified in Allotment Management Plans.

**Adaptive Management:** The modified proposed action recognizes the need to be adaptive in order to respond to changing resource conditions. Therefore, the modified proposed action incorporates management flexibility by providing for a range of allowable numbers that reflects variations in resource conditions and management objectives over time. Stocking would be adjusted within the range of numbers. Specific numbers of livestock would be determined by resource conditions and authorized in the bill for collection.

Timing of livestock movements on the Sycamore Allotment would be determined by utilization levels, forage conditions, water availability and would be specified in Annual Operating Instructions (AOI).

The timing, intensity, and/or duration of grazing in any pasture of the Sycamore Allotment would be adjusted as needed to achieve resource objectives. Additional vegetation growth would be allowed before any re-entry into a pasture. Table 2 summarizes the allotment-specific components of the modified proposed action.

**Table 2. Allotment-specific components of the modified proposed action**

Allotment	Grazing System	Grazing Season	Utilization Levels	Animal-Unit-Months <sup>a</sup>	Stocking Equivalent	Change from Current Permit
Sycamore	4 pasture deferred rotation	Yearlong	Upland forage (growing season) – 30-40% Upland forage (non-growing season) – 41-50% Upland Browse – 50% Riparian - 20%	Up to 5,484	Up to 450 cattle and 7 horses	No Change

a - Animal-Unit-Month (AUM) is the amount of oven-dry forage required by one mature cow of about 1,000 pounds, either dry or with a calf up to six months of age, or their equivalent, for a standardized period of 30 animal-unit-days.

**Range Improvements:** Construct new water developments to reduce direct grazing impacts to Sycamore Creek; install two cattleguards; expand a corral and holding pasture.

An updated Allotment Management Plan (AMP) would be prepared for the Sycamore allotment and would include mitigation measures and Best Management Practices (BMPs) to avoid or minimize effects to soil, water, and wildlife.

Monitoring of forage availability and utilization, range readiness and resource conditions would be used to determine whether management is being properly implemented and whether the actions are effective at achieving or moving toward desired conditions.

## Decision Framework

Upon completion of this EA, the District Ranger (deciding officer) will decide whether or not to re-authorize livestock grazing on the Sycamore Allotment based on the analysis provided in this EA. The District Ranger may select either of the alternatives analyzed in detail, or may modify and select an alternative, so long as the resulting effects are within the range of the analysis and disclosed in this document and the supporting reports. If a grazing permit is issued, the District Ranger will decide on the following:

- Where and when grazing would take place;
- How the allotment would be managed (e.g., management practices, grazing systems, supplements, standards, livestock numbers, timing of grazing, seasons of use, utilization guidelines);
- What connected actions such as resource treatments, new range developments or reconstruction of existing improvements would be implemented and on what schedule these actions would occur; and
- What mitigation or design features would be implemented.

This EA is not a decision document. Rather, it discloses the potential environmental consequences of implementing the modified proposed action and no action. A decision notice, signed by the District Ranger after the completion of the assessment, will document the decisions made as a result of this analysis.

## Public Involvement

The proposal has been listed in the Prescott National Forest Schedule of Proposed Actions (SOPA) since the second quarter (01/01/2007 to 03/31/2007) for fiscal year 2008. The proposal was provided to the public and other agencies for comment during scoping. In addition, as part of the public involvement process, the agency has met with Sycamore Allotment permittee and the U.S. Fish and Wildlife Service.

A scoping letter was mailed to 20 individuals and organizations on June 23, 2008. The letter described the proposed action and requested comments on the proposed Sycamore Livestock Grazing Project. Six responses were received from which 69 comments were generated. These scoping comments were reviewed and are included in the project planning record. Each comment was reviewed to determine if it constituted an issue. As stated in the June 23, 2008 scoping letter, comments received for the December 26, 2006 scoping letter have been considered in this analysis. The following categories were used to categorize comments:



1. Comment is not a significant issue, a statement of opinion, no concern, heading to actual comments, or beyond the scope of this project;
2. Comment resolved by Forest Plan direction, standards and guidelines, best management practices, law/regulation/policy, or project design features;
3. Comment used in the analysis to disclose effects;
4. Comment used to formulate alternatives, or addressed in an alternative as noted.

A cover letter and Summary of the Environmental Assessment for the Sycamore Livestock Grazing Project was mailed to 20 individuals on November 25, 2008, and a legal notice was posted in the Courier newspaper on November 26, 2008, which initiated a 30-day comment period. The summary EA included the purpose and need and alternatives, as well as a summary of the potential impacts by resource area and comparison by alternatives. Four responses were received, from which 33 comments were generated. Public comments and Prescott National Forest responses are included in the project planning record.

Using the comments from the public and other agencies, the interdisciplinary team developed issues to be addressed.

## Issues

Issues serve to highlight effects or unintended consequences that may occur from the proposed action and alternatives, giving opportunities during the analysis to reduce adverse effects and compare trade-offs for the decision maker and public to understand (USDA FS 2008a). Issues are developed from public comments received during scoping. Issues are based on public disagreement with the proposed action and are divided into resolved and unresolved issues. To be considered an unresolved issue, a public comment must be:

- Site specific to the Sycamore Livestock Grazing Project Area, and relevant to the Sycamore Livestock Grazing Project proposed action and
- Show a disagreement with the proposed action that cannot be resolved except through the development of an alternative to the proposed action.

Based on initial public comment and additional field review, it was determined that the proposed action, as scoped, would not meet the purpose and need. For this reason, the proposed action has been modified.

The modified proposed action was reviewed internally by the Sycamore IDT to identify issues they felt needed to be addressed in this on-going analysis. The identified issues were evaluated, the IDT reviewed all comments, and no unresolved issues were identified following the analysis of public scoping comments.

### *Resolved Issues Not Considered in Detail*

The following issue was identified and evaluated for its relevance to this analysis.

**Issue:** Grazing in portions of the holding pasture may adversely affect pronghorn fawn viability because the reduced vegetation height leaves fawns exposed and vulnerable to predators.

**Resolution:** No critical fawning area exists in the holding pasture (Warnecke 2008). While some fawning has been observed, implementing a conservative use level for grazing would provide herbaceous cover of 7 to 9 inches which is sufficient for fawn hiding cover.

## *Resolved Issues Considered in Detail*

Merging public and agency concerns yielded the following issue that we plan to analyze in detail in the EA. Analysis will be completed to the level necessary to: (1) assess the direct, indirect, and cumulative effects of the modified proposed action and no action alternatives, (2) highlight differences among these alternatives in terms of maintaining or achieving desired conditions, and (3) identify any significant impacts that may be associated with the modified proposed action and No Action alternatives. Desired conditions and other pertinent Forest Plan direction that establish the analysis framework have been outlined in the EA.

The following issue will be addressed in the EA:

**Issue:** Gullyng and erosion are occurring in the holding pasture in the Sycamore Allotment.

**Resolution:** This issue is being addressed by implementing conservative use levels and with mitigation measures specific to Alternative 2.

## Tribal Consultation

Six Native American tribal governments were sent the scoping letter and maps with a request for their comments, concerns or issues. A copy of each letter is on file in the Sycamore Allotment project record. These tribal governments included the Fort McDowell Indian Community, the Hopi Tribe, the Hualapai Tribe, the Tonto Apache Tribe, the Yavapai- Apache Nation, and the Yavapai-Prescott Tribe. None of the tribal governments responded with any issues, concerns or comments. If any letters pertaining to this project are received from the tribal governments, the Forest will respond to their comments.

## U.S. Fish and Wildlife (USFWS) Consultation

The Forest Service initiated informal grazing consultation meetings with USFWS to discuss grazing management on the Sycamore Allotment. The Forest Service, the permittee, and the USFWS conducted site visits multiple times along Sycamore Creek. Consultation on this project will be completed prior to signing the decision document.

## Implementation Date

The expected implementation date of this project is subject to specified time frames set forth in Forest Service appeal regulations found at 36 CFR Part 215.

## Chapter 2 – Alternatives

This chapter describes and compares the alternatives considered for the Sycamore Livestock Grazing Project. It includes a description of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public.

### Alternatives Considered but Eliminated from Detailed Study

The following alternatives were considered, and a brief rationale for eliminating them is provided below.

#### *Proposed Action*

The IDT reviewed the proposed action as scoped on June 23, 2008. Based on additional field review in the holding pasture, an area with gully formation was found in the southeast corner of the pasture. It was determined that the proposed action, as scoped, would not meet the purpose and need (i.e., continued domestic livestock grazing is consistent with the goals, objectives, standards and guidelines of the Forest Plan). For this reason, the proposed action was dropped from further detailed analysis.

#### *Sycamore Creek Exclusion*

Public comments received from the June 23, 2008 scoping notice suggested that the Prescott National Forest should consider another alternative that includes aggressive measures (i.e., exclusion of livestock grazing in Sycamore Creek's perennial stretches) should a closer examination of proposed riparian protection measures find they are inadequate.

When developing the proposed action, a non-growing season use of the riparian area in the Loball pasture was considered by the IDT, but was not further developed because it would result in undesirable impacts to the vegetation and soils resources in the other three upland pastures. Many portions of Sycamore Creek are not accessible to cattle due to topography. Construction of fencing along the creek would not be feasible or practical due to poor access and rough terrain. It was also determined that the addition of a fence next to the creek would cause unacceptable levels of trailing and soil disturbance adjacent to the fence, leading to sedimentation into the creek. For this reason, the Sycamore Creek Exclusion alternative was dropped from further detailed analysis.

### Alternatives Studied in Detail

There are two (2) alternatives studied in detail for this analysis: Alternative 1 – No Action, and Alternative 2 – modified proposed action.

#### *Alternative 1 - No Action*

Forest Service Policy (Forest Service Handbook 2209.13) requires the Forest Service to identify no grazing as the No Action alternative. Under this alternative, grazing would not be authorized and use of the Sycamore Allotment (Figure 1) by domestic livestock would be discontinued after 2 years. Existing boundary fences would be assigned to adjacent permittees. Interior fences would be removed to mitigate potential adverse impacts to wildlife and public users. Water developments important for wildlife would be maintained where feasible through the use of other program funds or volunteers.

## *Alternative 2 - Proposed Action (Modified)*

A modified proposed action has been developed to meet the project's purpose and need. Alternative 2 - modified proposed action includes the components of the original proposed action as scoped on June 23, 2008, but adds range structural improvements, and specific resource protective measures for soil and water resources, and wildlife. Additionally, this alternative removes the "cool growing season" designation from the grazing intensity prescription and addresses the cool season species prescriptions through adaptive management and in the selection of "key species" in the overall allotment grazing management. These modifications are discussed in their applicable sections below.

The modified proposed action consists of five components: authorization, monitoring, adaptive management, range structural improvements, and resource protection measures. The Forest Service proposes to continue to authorize livestock grazing on the Sycamore Allotment (Figure 1) in a manner consistent with Forest Service policy and the Forest Plan. The modified proposed action follows current guidance from Forest Service Handbook (FSH) 2209.13, Chapter 90 R3 supplement (Grazing Permit Administration; Rangeland Management Decision-making 8/29/07).

### Authorization

The Verde District Ranger, Prescott National Forest proposes to continue to authorize yearlong livestock grazing on the Sycamore Allotment under the following terms:

- Grazing would be permitted year-round on the allotment, but may be less in some years depending upon available forage with a proposed permitted use of up to 450 cow/calf and 7 horses yearlong (5,484 animal unit months).
- Grazing would occur through a rotational system (deferred/rest-rotation) which would emphasize grazing management to meet the needs of the plant's physiological requirements. Table 1 summarizes the pastures and acreages on the Sycamore Allotment.
- Annual authorized livestock numbers would be based on existing conditions including available water and forage. Adjustments to the annual authorized livestock numbers (increase or decrease) may occur during the grazing year, based on conditions and/or range inspections.
- The Sycamore Allotment's grazing rotation system would continue to emphasize a 4-pasture 1-herd system which would realize one pasture rested fully, 1 year out of 4, and would realize summer growing season deferment or partial deferment in each pasture, 3 years out of 4. This grazing rotation would allow a staggered entry into pastures at different seasons each year. The grazing rotation would target a 4 month grazing window per pasture, but the actual schedule would vary according to adaptive management principles.
- Flexibility in the timing of entry and pasture moves would be determined by available forage and management standards and objectives specified in the Allotment Management Plan (AMP) and AOI.

- Livestock grazing during the summer (warm-season, typically July -September), would be managed at conservative (31-40 percent) use intensity based on key herbaceous species identified within key areas<sup>1</sup> on the allotment.
- Livestock grazing prescribed use levels outside of the summer forage growing seasons would be managed at a moderate (41-50 percent) use intensity based on selected key herbaceous species within key areas on the allotment.
- Livestock grazing prescribed use levels would be managed at moderate (41-50 percent) use intensity based on selected upland key browse species current leader growth at any given time during the year.
- Relative use of current year's production would be managed at 20 percent based on selected key riparian woody species (willow, cottonwood, ash and alder). Livestock grazing on selected key riparian herbaceous species within critical monitoring areas would be managed at a 50 percent relative use.

These use prescriptions would apply at any time of the year that livestock are in the riparian area.

## Monitoring

In order to evaluate continued progress toward meeting range management objectives, grazing monitoring would be conducted. Additionally, in order ensure the modified proposed action would not exceed agreed to parameters for the Gila chub, populations and critical habitat would be monitored and a yearly report outlining monitoring results would be provided to the USFWS and the permittee.

Two types of grazing monitoring would be conducted:

1. Implementation monitoring would be conducted by the Forest Service and/or permittee and may include, but is not limited to the following: livestock actual use data, grazing intensity evaluations during the grazing season (within key and critical areas), utilization at the end of the growing season (within key areas), and visual observation of vegetation and ground cover.
2. Effectiveness monitoring to evaluate the success of management in achieving the desired objectives would occur within key areas on permanent transects at an interval of ten (10) years or less. Effectiveness monitoring may also be conducted if data and observations from implementation monitoring (annual monitoring) indicate a need.

Both qualitative and quantitative monitoring methods would be used in accordance with the following publications: Interpreting Indicators of Rangeland Health (Technical Reference 1734-6, 2005), Region 3 Rangeland Analysis and Management Training Guide, and the Region 3 Allotment Analysis Handbook (Pellant et al. 2005). When possible, annual and long term monitoring would be conducted and evaluated with the permittees and/or the interdisciplinary team.

### *Riparian/Stream Monitoring*

To determine whether the riparian vegetation and stream channels are responding to the proposed livestock grazing management in Sycamore Creek several monitoring techniques will be used. Annual monitoring of livestock use helps determine if grazing management is being implemented as planned and if the plan is helping to achieve resource objectives. This includes monitoring annual indicators of grazing

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<sup>1</sup> key area- relatively small portion of a range selected because of its location, use or grazing value as a monitoring point for wildlife and domestic livestock grazing use. It is assumed that key areas, if properly selected, will reflect the overall acceptability of current grazing management over the range.

use, assessing the effects of this use on resource objectives, and then evaluating whether or not the grazing plan needs to be adjusted (USDI 2008). Long-term monitoring will reveal general condition and trend over time of the stream channel and vegetation. Short-term monitoring of streambank alteration, use on woody species and use on residual vegetation will determine when cattle will need to be moved out of the riparian area. Grazing intensity may be measured before and during the growing season and can be utilized as a tool to manage livestock so that expectations of end of growing season utilization measurements can be achieved. A key area near Rock Bottom will be established by the IDT and permittee.

In the Sycamore critical areas<sup>2</sup>, allowable grazing use is 20 percent relative use of current year's production on riparian woody species (willow, cottonwood, ash and alder) and 50 percent relative use on key herbaceous species (sedges, rushes, grasses). The monitoring locations would be established collaboratively by members of an ID Team (i.e., Forest Service Rangeland Management Specialist and Fish Biologist, and the Sycamore Allotment permittee) prior to the implementation of the project.

Proper functioning condition (PFC) creek assessment would continue with an IDT. The three reaches will be assessed every three to five years to determine conditions and trend. The standard PFC checklist would be filled out and a summary determination made and updated as to the assessment of the stream's condition (i.e., properly functioning, functioning at risk, not functioning, or unknown). A trend assessment should be made and updated as needed. This monitoring would be done after the cattle have left the pasture.

### *Gila Chub Population Monitoring*

The Loball pasture on the allotment contains a reach of Sycamore Creek that is occupied by the Gila chub (endangered). Population monitoring would be conducted every year to determine status and trends.

### *Gila Chub Critical Habitat Monitoring*

The three reaches of aquatic habitat along Sycamore Creek would be monitored for livestock impacts to critical habitat (see Figure 2). The following characteristics of critical habitat would be monitored:

- Pool habitat monitoring would be conducted annually in reaches 1-3 of Sycamore Creek to ensure that pool quality or frequency is not being impacted by livestock actions. The amount and quality of pool habitat would be surveyed during base flow conditions, (i.e. outside of high flow events or drought periods). A standard protocol, such as the Forest Service Region 3 Stream Inventory Methodology version 3.1 (USDA 2005d) would be used.
- Streambank alteration monitoring would be conducted annually in reaches 1-3 of Sycamore Creek to determine that no more than 20 percent of the banks in riparian areas have been impacted by livestock actions. Streambank critical areas' locations would be collaboratively selected to be used as indicators of livestock impacts to the streambank and as a management tool for the permittee that trigger his management actions when significant streambank alteration becomes apparent.

## **Adaptive Management**

This alternative incorporates management flexibility by providing for a range of allowable numbers that reflects variations in resource conditions and management objectives over time. Stocking would be

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<sup>2</sup> **Critical area-** An area which must be treated with special consideration due to inherent site factors, size, location, condition, values, or significant potential conflicts among users.

adjusted within the range of numbers. Specific numbers of livestock would be determined by resource conditions and authorized in the AOI.

The following adaptive management strategies may be implemented:

- Timing of livestock movements on the Sycamore Allotment would be determined by utilization levels, forage conditions, water availability, and would be specified in AOI.
- The timing, intensity, and/or duration of grazing in any pasture of the Sycamore Allotment would be adjusted to lower levels as needed to achieve resource objectives. Additional vegetation growth would be allowed before any re-entry into a pasture.
- Gila chub monitoring measures employed for Sycamore Creek would be managed to the described grazing use and streambank thresholds. Upon meeting these thresholds the permittee would immediately manage livestock away from Sycamore Creek into another portion of the pasture and if that is not possible, into the next available pasture.
- Gila chub monitoring measures: Gila chub population, pool habitat, and proper functioning condition (PFC) would need to show stable or upward trends or consultation with the U.S. Fish and Wildlife Service would be re-initiated.

Adaptive management would also allow for the construction of rangeland improvements if they have been identified and are determined, through monitoring, to be necessary for achieving resource objectives. However, if some or all improvements are not implemented, the upper limits of permitted livestock numbers are likely not achievable.

## Range Structural Improvements

Range improvements are authorized per 36 CFR 222.9. Forest Service Range Improvements are any activity or program designed to improve production of forage and includes facilities or treatments constructed or installed for the purpose of improving the range resource or the management of livestock (36CFR 222.1 (b)(21)). Structural improvements are improvements requiring construction or installation undertaken to improve the range or to facilitate management or to control distribution and movement of livestock (36 CFR 222.1 (b)(21)(ii)). No new roads would be constructed in association with these range structural improvements. The following range structural improvements are proposed:

### *Fencing and Cattleguards*

The Tule corral would be expanded by constructing approximately 1/3 mile of fence. The Tule corral is the northern corral shown on Figure 3. The Double T holding pasture would be expanded by constructing approximately 3/4 mile of fence. Additionally, one cattleguard would be relocated, and a new cattleguard installed to allow for more cattle to be overnighed in the corral when used for rotating pastures. The Double T corral is the southern corral to the east of the Double T Ranch shown on Figure 3.



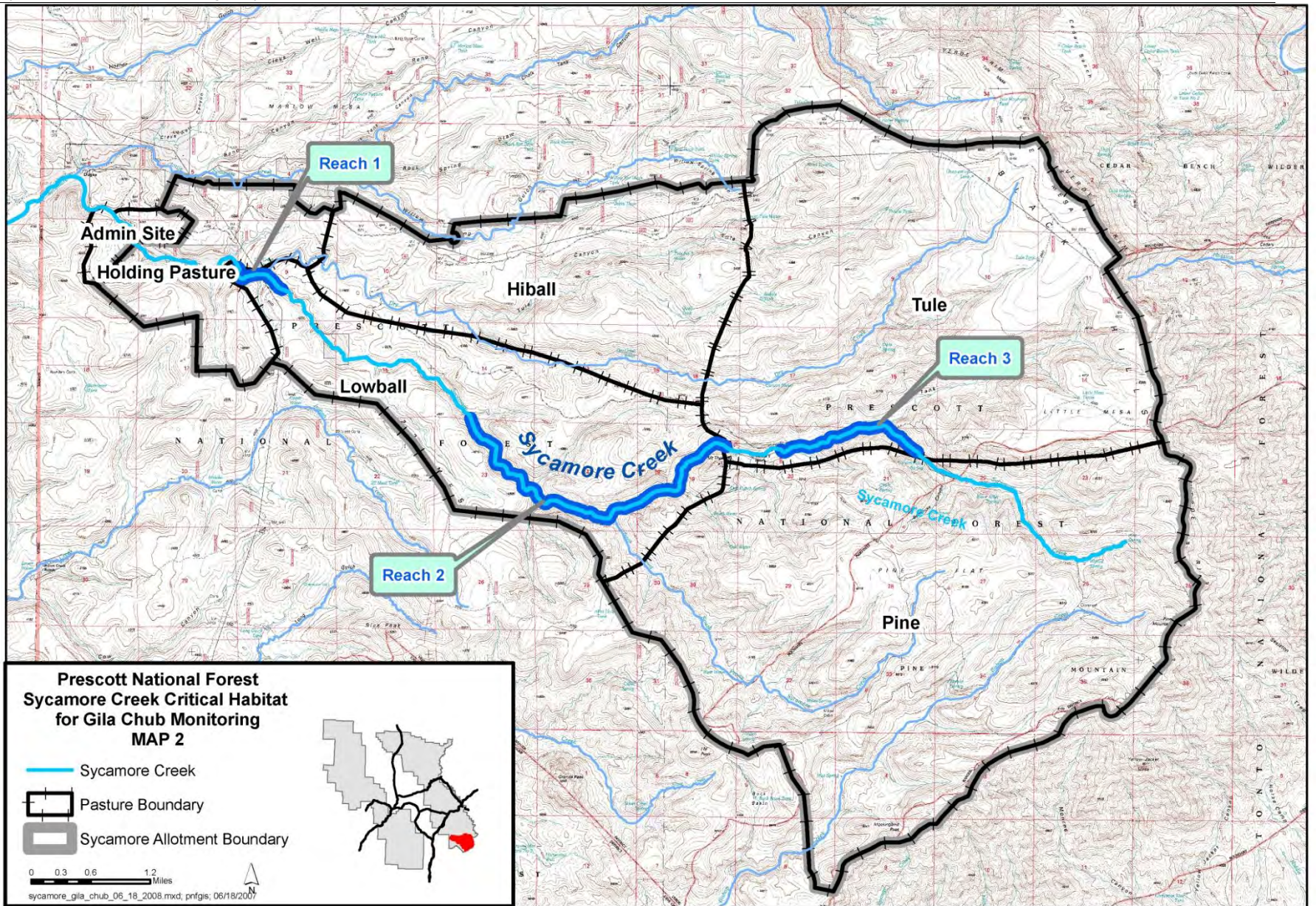


Figure 2. Sycamore Creek critical habitat for Gila chub monitoring



### *Water Developments*

A water development would be installed in Loball pasture to provide additional water for livestock in the uplands and reduce their reliance on Sycamore Creek (Figure 3). Development of the water south of Sycamore Creek would serve to better distribute livestock across the pasture, reduce livestock use in the riparian area, reduce livestock access to Gila chub habitat, and help to insure that pasture rotation is not unduly impacted by prematurely meeting utilization thresholds for riparian and/or Gila chub habitat monitoring standards. No new roads would be constructed in association with these water developments. Three options for the source of this water are outlined below. These offer certain additional opportunities for providing water to other areas of the allotment. The following three water source options are proposed:

**Source Option 1:** The first option as the source for this water would be a new well drilled on private property owned by the range permittee. The private parcel is located T11N, R4E, Sec.15 &16 (Figure 3). The well would be located near Sycamore Creek. This option includes authorizing an access route for equipment to drill a well. In order to drill the well, the permittee would access the private property via a temporary road, using an old existing travel way<sup>3</sup> for alignment. This existing travel way served as the access to this private property, but is no longer used. It may be necessary to remove juniper trees in, or adjacent to the travel way prior to use. Use of this temporary road is only authorized as needed for construction of the well. Any other use is not authorized. The temporary road would be closed after well installation. Any future maintenance would need to be reauthorized. Water would be piped above ground from the source well to two water trough areas (SE ¼ Sec. 15 and NE ¼ Sec. 22). If this well is successful, water would also be piped from near the private parcel above ground to the T-anchor corrals located in the Loball Pasture (SW ¼ Sec. 14) and to Hiball Pasture (SW ¼ Sec. 10). At full implementation, three segments of pipeline would originate from the well. Solar-powered water pumps would provide water to the upland stock tanks from the well.

If monitoring shows that livestock reliance on Sycamore Creek still needs to be reduced with Source Option 1 well, a trick tank (i.e., guzzler) could be installed along with storage tank and water trough as shown on Figure 3. If the trick tank is installed, it would provide an opportunity for additional water in the Hiball Pasture. Water would be piped above ground to the trough as shown on Figure 3.

**Source Option 2:** In the event that funding for this well (source option 1) cannot be secured, or other reasons prevent drilling of this well on private land, the secondary source option (Figure 4) for this water development would be a new well drilled near the water trough site on National Forest System Land (Figure 4, NE ¼ Sec. 22). This source option would not include water to the corrals in Loball or Hiball pastures.

If monitoring shows that livestock reliance on Sycamore Creek still needs to be reduced with the source option 2 well, a trick tank (i.e., guzzler) could be installed along with storage tank and water trough as shown on Figure 4. If the trick tank is installed, it would provide an opportunity for additional water in the Hiball pasture. Water would be piped above ground to the trough as shown on Figure 4.

**Source Option 3:** In the event that the primary and secondary water source wells do not produce water, the source for this water development would be an existing well located on the adjacent Long Gulch Allotment (22 Mesa well) (Figure 5). Water would be piped above ground from the 22 Mesa well to the water trough area. Agreements would be made with the Long Gulch permittee as to how the maintenance

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<sup>3</sup> Travel Way – Any transportation facility that allows vehicle passage of any sort, that came into existence without plans, design or standard construction methods, that is not maintained or signed and has a very low traffic volume.

for the well would be shared with the Sycamore permittee. An understanding would be developed regarding how the water would be shared when both permittees are in need of water at the same time.

If monitoring shows that livestock reliance on Sycamore Creek still needs to be reduced with Source Option 3, a trick tank (i.e., guzzler) could be installed along with storage tank and water trough as shown on Figure 5. If the trick tank is installed, it would provide an opportunity for additional water in the Hiball Pasture. Water would be piped above ground to the trough as shown on Figure 5.

Range improvements are cost shared with the permittee. Often the Forest Service provides the materials and the permittee provides the labor.

## Mitigation Measures Specific to Alternative 2

Mitigation measures are included under Alternative 2 and are designed to avoid or reduce potential resource conflicts, respond to issues, or improve implementation effectiveness. These measures were developed by the interdisciplinary team after a careful review of Alternative 2, and would be applied in a site-specific manner to the general implementation to avoid or minimize potential resource impacts.

1. A physical retention structure designed to retain sediment will be placed in the erosive gully in the Holding Pasture. This designed feature will include placement in the gully itself and additional structures adjacent to the gully including mechanical contouring.
2. Monitoring will be conducted specific to conditions in the holding pasture for grazing and soil. A key area will be established in the holding pasture. Specific soils effectiveness monitoring will be conducted on the gully's physical control structure. In addition, through monitoring of the key herbaceous vegetation, soil conditions will be interpolated as needed to determine trend. In the event that soil trend is downward, additional grazing management changes would be implemented including modifications to timing, intensity, or duration in the holding pasture.
3. Fences that are constructed or reconstructed will be designed to meet Forest Service specifications for safe wildlife passage. Fence design will be approved by the Forest Service prior to implementation
4. Place approved wildlife escape ramps on all water developments (both new construction and retrofit for existing), as appropriate.
5. Provide pronghorn fawning cover in the small mesa area in the southern part of the Holding pasture during the pronghorn fawning period of March-May each year (approximately 160 acres), by grazing at conservative use levels.
6. Well Monitoring – A piezometer with a pressure transducer to measure stream level would be installed in reach 1 of Sycamore Creek before the well is drilled to identify baseline groundwater conditions. Following installation of the well, a pump test should be conducted. The Forest hydrologist will work with the permittee to establish a maximum drawdown rate to ensure adequate ground water is moving through the system in order to mitigate impacts on downstream Gila chub critical habitat. A data logger may be installed in the well to record water levels over time.

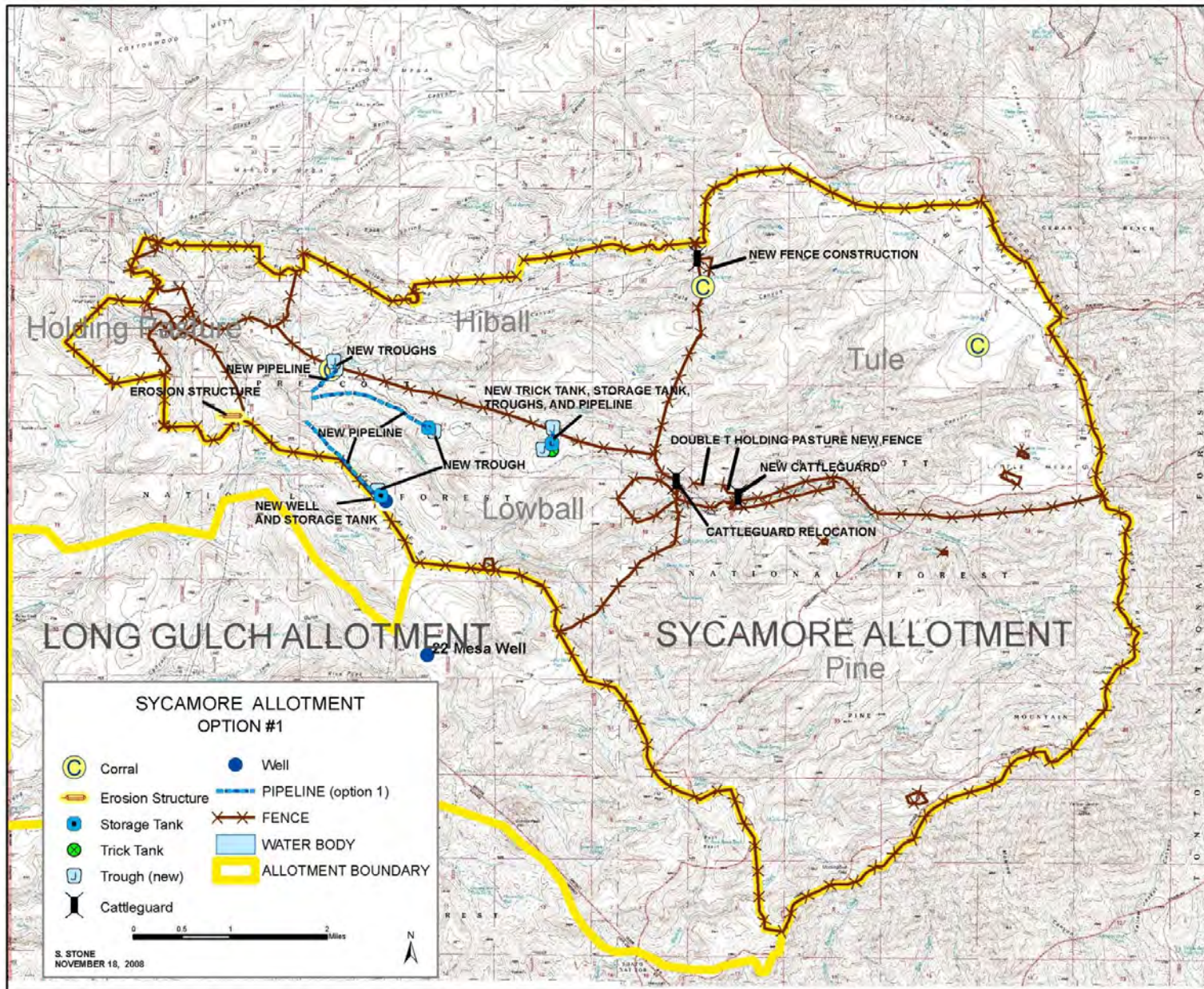


Figure 3. Source option 1 - additions to existing range improvements (watering developments)



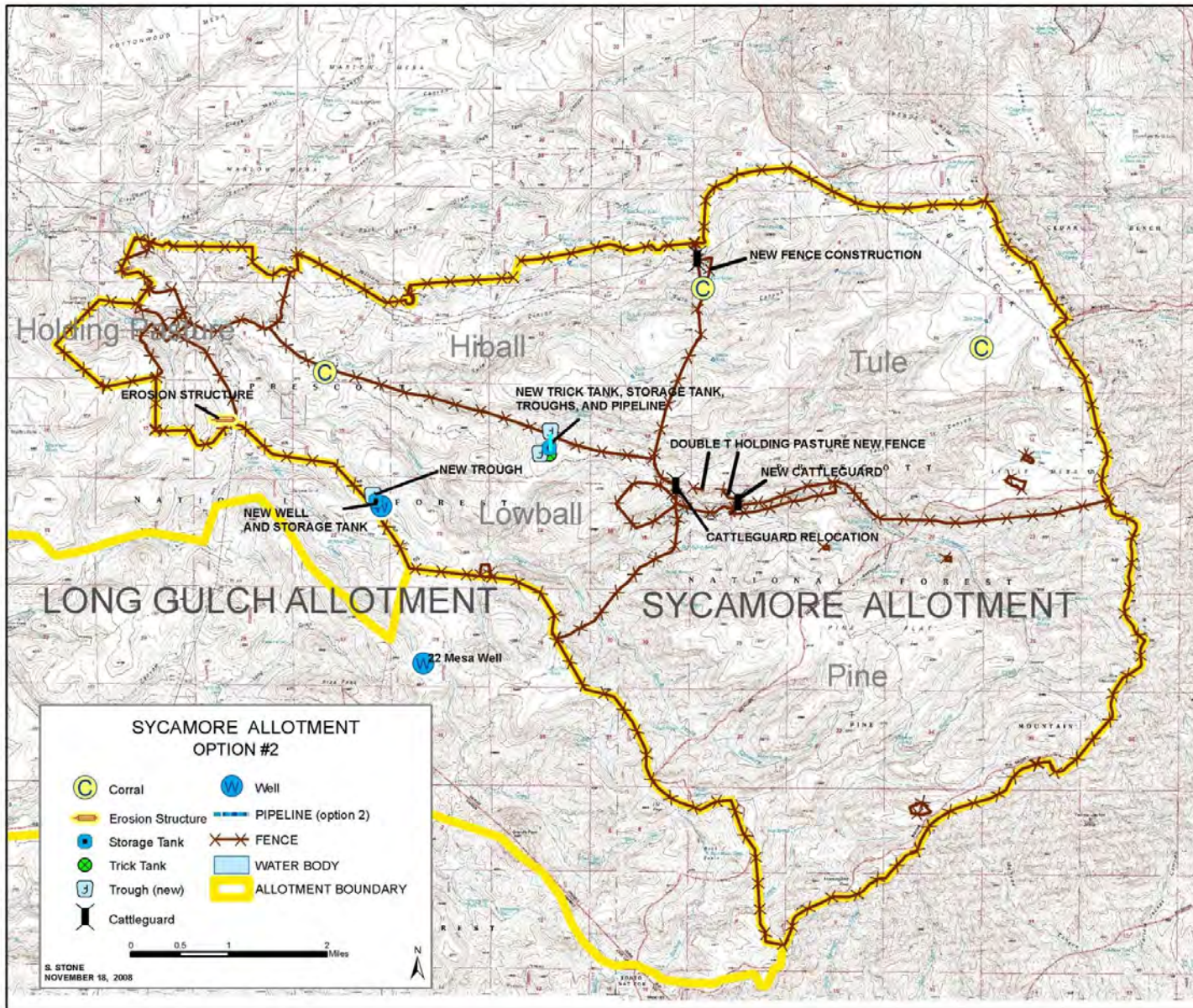


Figure 4. Source option 2- additions to existing range improvements (watering developments)



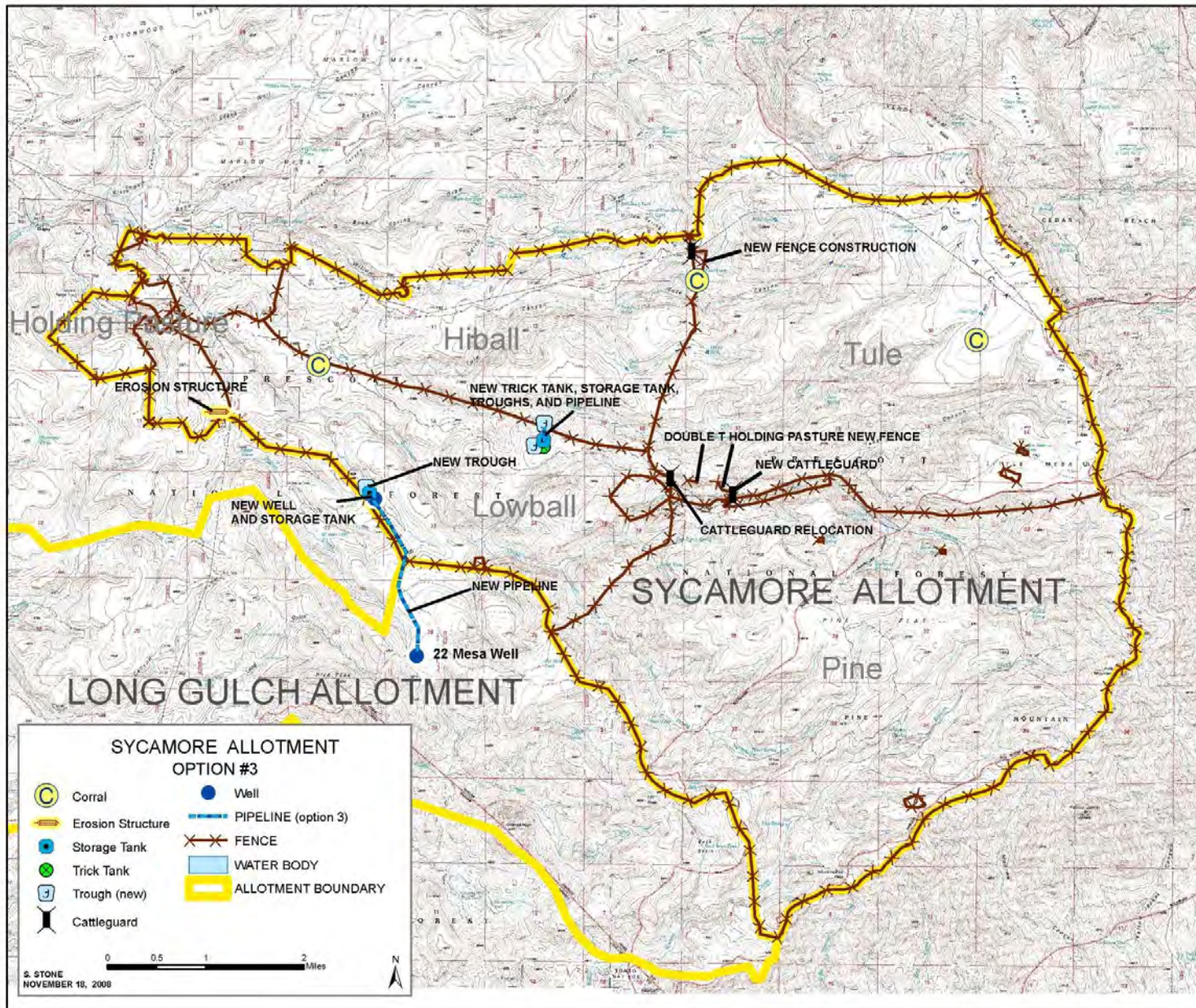


Figure 5. Source option 3- additions to existing range improvements (watering developments)

## Chapter 3 - Environmental Consequences

This section provides a description of the affected environment (i.e., existing conditions) and disclosure of the potential environmental impacts of the alternatives considered in detail. It provides the information to determine whether it is necessary to prepare an environmental impact statement (EIS). If it is determined an EIS is not necessary, the agency will prepare an associated finding of no significant impact (FONSI) which will briefly present the reasons why the action will not have a significant effect on the human environment and for which, therefore, an EIS will not be prepared. Further analysis and conclusion about the potential effects are available in reports for each resource including supporting documentation cited in those reports. This information is located in the project planning record located at the Chino Valley Ranger District Office of the Prescott National Forest at 735 N. Hwy 89, Chino Valley Arizona 86323. These documents are available upon request; office hours are 8:00 to 4:30 M-F, phone number (928) 777-2200.

The effects analysis in this section discloses the direct, indirect and cumulative effects of the proposed action and alternatives, as directed by Forest Service NEPA procedures (36 CFR part 220). The analysis of cumulative effects considers the effects of past, present and reasonably foreseeable actions in combination with effects predicted from Alternative 1- No Action and Alternative 2- modified proposed action. Regarding the consideration of past actions, the Forest Service NEPA procedures follow guidance provided by the Council on Environmental Quality.

A summary list of the past, present, and reasonably foreseeable actions that could contribute to cumulative effects are shown in Appendix B. Past actions and natural processes contribute to present effects or existing environmental conditions. All listed actions in Appendix B have been considered in each cumulative effects analysis; however, each analysis examines only those actions and events that are relevant to the resource in question.

The terms “effects” and “impacts” as used in this section are synonymous.

### Vegetation Resource

#### *Affected Environment*

#### Vegetation Condition

#### *Terrestrial Ecosystem Survey*

The vegetation of the Prescott National Forest is complex and diverse. In order to effectively manage this diversity, it is necessary to understand the soils, the potential vegetation associated with each of these soils, and the vegetation that currently exists on these sites. The Terrestrial Ecosystem Survey of the Prescott National Forest (hereafter referred to as TES), describes and maps the soils and potential vegetation (ecological types) for the Forest (USDA, 2000). This ecological classification describes the existing vegetation (community types) associated with the ecological map units (TES map units). The objective of this classification is to categorize existing vegetation data into a framework of recognizable plant communities called community types based on the potential vegetation community and soil, climate, landform and disturbance characteristics described in the TES.



For this project, TES ecological map units were used to describe the vegetation conditions of the following five vegetation communities: pinyon-juniper, ponderosa pine, grassland, grassland with higher shrub component, chaparral, and riparian. These vegetation communities are also subdivided by parent material and slope gradient. Each vegetation community is described by subdivisions within the vegetation community in the Vegetation Resource Report. Existing vegetative conditions on the Sycamore Allotment are described by vegetation community in Table 3. See the vegetation report for more details on TES potential.

**Table 3. Similarity of Vegetation to Potential Natural Community**

<b>Vegetation Community and Map Unit</b>	<b>% of Allotment</b>	<b>% of Pasture</b>	<b>Soil Type</b>	<b>% Slope</b>	<b>Similarity to Potential Vegetation Herbaceous Condition and Plant Community</b>
Grassland Map Unit 372	2	Hiball: 11 Holding: 6	Basalt	0-15%	Hiball Pasture: Mid similarity rating Holding Pasture: Mid similarity rating
Desert Shrub Map Unit 373	1	Hiball: 7	Basalt	0-15%	Hiball Pasture: Mid similarity rating
Riparian Map Units 41,43,50,55	3	Tule: 2 Pine: 3 Hiball: 3 Loball: 5	Alluvium	0-5%	Hiball Pasture: at Proper Functioning Condition Loball Pasture: 2/3 at Proper Functioning Condition, 1/3 at Functioning at Risk Tule/Pine Pastures: at Proper Functioning Condition
Pinyon/Juniper Woodland Map Units 427,431,461,490	15	Hiball: 11 Loball: 18 Tule: 27 Pine: 5 Holding: 15	Basalt	0-15%	Hiball Pasture: High similarity rating Loball Pasture: High similarity rating Tule Pasture: High similarity rating Pine Pasture: High similarity rating Holding Pasture: High similarity rating
Pinyon/Juniper Woodland Map Units 428,432,462,464,485,491	17	Hiball: 36 Loball: 43 Tule: 21 Pine: 20 Holding: 57	Basalt	16-39%	Hiball Pasture: High similarity rating Loball Pasture: High similarity rating Tule Pasture: High similarity rating Pine Pasture: Mid similarity rating Holding Pasture: Low similarity

<b>Vegetation Community and Map Unit</b>	<b>% of Allotment</b>	<b>% of Pasture</b>	<b>Soil Type</b>	<b>% Slope</b>	<b>Similarity to Potential Vegetation Herbaceous Condition and Plant Community rating</b>
Pinyon/Juniper Woodland Map Units 430	31	Hiball: 32 Loball:25 Tule: 30 Pine: 5 Holding:14	Basalt	40%+	Hiball Pasture: High similarity rating Loball Pasture: High similarity rating Tule Pasture: Mid similarity rating Pine Pasture: Mid similarity rating Holding Pasture: High similarity rating
Ponderosa Pine Map Units 560,570  Map Units 535, 540	12  3	Tule:7 Pine: 36	Basalt Metamorphic	0-40% 16-40%+	Tule Pasture: High similarity rating Pine Pasture: High similarity rating
Chaparral Map units 425, 436,448, 457, 475,478,551	16	Loball: 10 Tule: 11 Pine: 32	Granite	0-39%	Loball Pasture: Mid similarity rating Tule Pasture: Mid similarity rating Pine Pasture: Mid similarity rating

### **Stocking Rate**

A description of range management levels and intensity levels are provided in Appendix B of the Forest Plan (USDA 1986a). Grazing management standards and guidelines are provided in appendix I of the Forest Plan (USDA 1986a). Capacity is a product of current stocking, existing improvements, current management, along with resource capability. Monitoring data indicate that current stocking rate is in balance with the desired vegetation status. Annual Operating Instructions (AOI) adjust numbers of cattle and/or length of grazing season to accommodate utilization in a given year within the grazing system to meet goals of maintaining or improving conditions. Cattle health is also used to gauge carrying capacity. If the cattle are in good condition and show good weight gains through the years, this is a positive indicator that cattle numbers are in line with the allotment’s vegetative health.

Using Holechek 1988, considerations in determining stock rate as an estimation of livestock numbers was made based on various forage production data representing average, below average and above average production taken on the Sycamore Allotment. Calculations for livestock numbers based on slope and distance to water were used to develop a range of variability in what the allotment could run from one year to the next. Results from the calculations show that the allotment can run anywhere between current numbers up to 503 cattle yearlong (cyl). The current permit on the Sycamore allotment allows for 450 head of cattle (cow/calf) year round with 7 horses year round (5,484 animal-unit-months). Current

permitted cattle numbers within the current grazing management system fall within the carrying capacity of the allotment.

Grazing history and actual use on the Sycamore Allotment can be found in the project record.

## *Environmental Consequences*

### **Alternative 1**

Under Alternative 1, there would be no livestock grazing and utilization of vegetation by livestock would not exist. Any decline of resources attributed to livestock would cease. The response to no grazing by livestock would vary with species and over time.

#### *Uplands - Direct and Indirect Effects*

Removal of livestock is expected to increase vegetative ground cover and perennial grass species diversity in areas where cover and diversity are limited by grazing. The response to no grazing by livestock would vary among species and over time. Forage plants would continue to grow without being grazed by livestock. However, a decline or increase due to natural process (e.g. drought) could continue.

There would be no appreciable change in cover in grass or shrub anticipated in the pinyon-juniper community, and no expected change in herbaceous ground cover is anticipated in the Ponderosa pine community.

#### *Riparian - Direct and Indirect Effects*

In the short term, the exclusion of livestock from riparian areas would result in an increase in herbaceous production, litter accumulation, and woody species recruitment. However, over the long term the increase in litter may cause a decline in plant health (Clary and Webster 1989).

#### *Cumulative Effects*

Impacts from this alternative are minimal and do not act in conjunction with other past, present, or future actions or events to create cumulative effects (see Appendix B). While the increase in litter over the long-term may cause a decline in plant health, the effects of other actions by themselves or as a group do not create any cumulative impacts.

### **Alternative 2**

Livestock grazing on the Sycamore Allotment affects vegetation by reducing plant height, canopy cover, and ground cover. The degree of these effects is influenced by utilization guidelines and timing of use. Alternative 2 is expected to generally sustain existing conditions in all vegetation communities as described in the affected environment section above.

#### *Uplands - Direct and Indirect Effects*

In the pinyon-juniper vegetation community, there would be no increase in the tree and shrub canopy as a result of livestock grazing, and an increase in perennial grass frequency<sup>4</sup> (frequency being a proxy for grass cover) and current species diversity would be maintained with fluctuations in cover and diversity reflecting climatic conditions, specifically precipitation.

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<sup>4</sup> Frequency (as a measurement for trend) - The ratio between the number of sample units that contain a species and the total number of sample units.

Bare ground is expected to decrease with increasing litter as a result of the increased woody and herbaceous canopy, or maintenance of grass in areas where it is currently at or above TES predicted canopy cover. The current shrub canopy is expected to maintain its diversity and general cover characteristics. Litter is expected to fluctuate with precipitation in grasslands and remain relatively constant where overstory trees and shrubs are present and most litter is from these woody plants. Bare soil will reflect canopy cover and litter production.

There would be no appreciable change in cover in grass or shrub anticipated in the pinyon-juniper community. No change is anticipated in herbaceous ground cover in the Ponderosa pine community. Acceptable grass cover and diversity would continue in the grassland and grassland with higher shrub component vegetation communities. In the chaparral vegetation community, no change in shrub or grass cover is anticipated.

In the holding pasture on the small mesa portion, pronghorn fawning has been observed. A moderate grazing prescription is in place for livestock during the spring (March to May). The moderate utilization is 41-50 percent, which correlates to approximately 5-7 inches of stubble height on tobosa (Holechek and Gault 2000). Additionally, during the spring it has been observed that livestock tend to prefer early-greening grass species, such as curlymesquite and tend not to prefer tobosa during this time of year. With this occurring, stubble height on all herbaceous vegetation would be at least 8 inches, with an overall herbaceous vegetation cover of at least 8 inches during the spring.

#### *Riparian - Direct and Indirect Effects*

Grazing effects are expected to be minor within the riparian areas in the Sycamore Allotment because this alternative is designed to implement an allowable use standard of 20 percent of current year's growth of palatable woody species in the riparian corridor. These use prescriptions would apply at any time of the year that livestock are in the riparian area.

Proper grazing by livestock can restore the long-term productivity of most riparian areas and still be compatible with other uses (Chaney et al. 1990). The rate of improvement in riparian vegetation, when grazing is managed at the levels described under this alternative, is expected to have a similar result as described under Alternative 1, but at a slower rate.

#### *Cumulative Effects*

Cumulative effects analysis considers other activities within a larger analysis area (Appendix B) 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 change vegetation health and/or successional status, increase sediment delivery to the drainage network, impact channel profile, reduce riparian area functioning, or destabilize slopes. The past, present, and reasonably foreseeable future activities and natural events considered in the cumulative effects analysis for vegetation are dispersed recreation, firewood gathering, power line maintenance, fuel treatments, past wildfires and prescribed fire, roads, off road use, urban development, wildlife grazing, along with climate, and cattle grazing in areas outside of the project area boundaries.

Livestock grazing effects on this allotment and other allotments within this area affect vegetation by reducing plant height, canopy cover, and ground cover. The level or degree of grazing impacts is influenced by utilization guidelines and timing of use. The time frame for these combined effects is 20 years; ten years in the past and ten years in the future. This is due to changes in condition and trend in the vegetation that depend on the presence of favorable growing conditions after cattle leave the pasture.

If growing conditions are favorable, plant height and canopy cover would completely recover within one year. If growing conditions are not favorable, plant recovery would occur more slowly (up to two to three

years). Vegetation recovery from the other activities and natural events may take up to ten years depending on climate. Cattle grazing can cumulatively affect plant height and canopy cover of understory plants in combination with the aforementioned activities.

Rangeland condition is expected to remain static or, static to upward in trend with cattle grazing additive to other activities and natural events. This project does not cumulatively change the condition or trend downward on the allotment. Cumulatively, the combination of these effects and the effects of current management would not lead to irreversible effects to vegetation.

This alternative combined with past, present and reasonably foreseeable future actions would not lead to cumulative adverse effects on riparian, channel or watershed condition because timing, duration, and frequency of use that control livestock use in the uplands and along riparian areas are expected to continue to maintain proper functioning condition (PFC).

Several past, present and reasonably foreseeable future actions are and will be occurring on both public and private lands. All of the activities on public lands have had some level of environmental analysis. The past, present, and reasonably foreseeable future activities and natural events considered in the cumulative effects analysis for vegetation are dispersed recreation, firewood gathering, power line maintenance, fuel treatments, past wildfires and prescribed fire, roads, off road use, urban development, wildlife grazing, along with climate, and cattle grazing in areas outside of the project area boundaries.

Under this alternative, the range management status for condition and trend would remain the same or move upward. Past, ongoing and foreseeable future activities are not known to have, or potentially have any adverse effects on rangeland resources or the riparian resource.

Impacts in this alternative are not considered adverse and do not act in conjunction with other past, present, or future actions to create cumulative effects. The effects of other actions by themselves or as a group also do not create any adverse cumulative impacts.

While the direct activities affiliated with prescribed, wild or natural fire treatments can expose, compact, displace, and create unstable soil conditions that could potentially increase run off, erosion, sedimentation, and increased peak flows, all past, present and foreseeable future uses of fire on forest lands apply BMPs to mitigate any potential degradation to the vegetation, soil and water resources. Portions of the Sycamore Allotment may be treated for juniper removal in the foreseeable future. These actions would result in short term soil disturbance, but are expected to contribute to plant community health over the long term by restoring a more natural vegetative mosaic with increased herbaceous cover in treated areas.

In conclusion, Alternative 2 would not lead to cumulative adverse effects on vegetation or riparian resources. Implementing BMPs (Appendix A) and mitigation measures (see Mitigation Measures Specific to Alternative 2) would minimize any potential adverse effects of actions included as part of this project. Implementing BMPs and considering the small area of the project compared with watershed area, any cumulative effects to vegetation and riparian resources would be very minor in extent.

## Soil Resource and Watershed

### *Affected Environment*

#### Soils

The methods used are from the Region 3 Soil Management Handbook (USDA Forest Service, 1999). A summary of soil ratings as well as stability rankings, trend, slope, aspect, pasture, and percent ground cover is provided in Tables 2, 3 and 4 in the soil and watershed report. Seventeen key TES units were surveyed across 26 sites in the Sycamore Allotment. Three sites were found to be unsatisfactory, four were impaired, and the remaining 19 sites were rated as satisfactory. The impaired and unsatisfactory sites were concentrated in the holding pasture, which will be discussed in detail later in this document.

There were no sites that had any differences in soil texture from the expected reference conditions in the TES of the Prescott National Forest (Robertson et al., 2000). This is important because symptoms of widespread erosion are displayed when there is evidence of a loss of fine material in the texture of soils.

There were 6 unstable sites identified, and all but one of the unstable sites was found in the holding pasture, which shows a trend toward negative conditions in this pasture.

Generally, the sampling sites did not yield any overall detrimental soil concerns. There were areas such as stock ponds, corrals, fence lines, and salting sites where there was concentrated trampling and compaction. These only constitute a small portion of the allotment and are not cause for concern. The one major trend found was overuse and unsatisfactory conditions in the holding pasture. This is due primarily to the fact that the holding pasture is the smallest pasture and is used year round while all of the other pastures are rotated with lengthy rest periods.

A map showing the TES units and a summary of all TES units on the Sycamore Allotment is provided in the soil specialist's report. There are a total of 5,706 acres (20.5 percent of the allotment) of impaired TES units. There are 22,110 acres (79.5 percent of the allotment) of satisfactory TES units. Impaired TES units do not preclude an area from grazing, but serve to alert range managers that these soils are vulnerable to potential future degradation and need attention. The six impaired TES units were in that state for one of two reasons: 1) the area shows evidence of livestock use (such as the holding pasture); or 2) there is encroachment of shrubs (mainly juniper) to the detriment of desirable range grasses.

#### Watershed

The watershed is dominated by basalt bedrock with an underlying layer of sandstone and granitics. Basalt develops regular vertical columns with a high hydraulic conductivity. The uppermost layers of basalt also break down to form thick layers of high water holding capacity clays with a low hydraulic conductivity. Water is absorbed in these clays, slowly permeates down gradient into the basalt columns and then eventually hits the sandstone/granite layer with a low hydraulic conductivity and takes a more horizontal down gradient route. This water eventually —“*daylights*” as springs at Sycamore Creek where it feeds the stream system and creates perennial reaches.

TES units in the holding pasture were rated as impaired. There is a large gully formation in the southeastern portion of the pasture, near the boundary with Loball pasture along the Silver Creek (FR 677) road (see appendix 8 in Soil and Watershed Report). This area has reduced water interception and increased overland flow, resulting in large amounts of sheet erosion, which in turn has increased flow into

all lower-lying draws. This area is also the headwaters for a small tributary to Sycamore Creek. The portion of Sycamore Creek into which this tributary feeds is also critical Gila chub habitat.

### Streams and Riparian Zones

The three reaches of Sycamore Creek which are critical Gila chub habitat were selected for proper functioning condition (PFC) assessment. All three reaches were determined to be in functional condition, with reach 2 functional-at risk. In reach 2, the upper 2/3 of reach are in balance, but the lower 1/3 of reach is out of balance due to excessive sedimentation from the recent Cave Creek Complex fire.

### Water Quality

One stream segment rated for water quality by the Arizona Department of Environmental Quality (ADEQ) occurs within the project area. Water quality ratings in support of all designated use classifications are attaining with no exceedances for Sycamore Creek (ADEQ 2008). Although this is being discussed under the Soils and Watershed section, water quality was assessed in the Fisheries Resource Report as an indicator of the health of the macroinvertebrate aquatic community in relation to turbidity levels. See also Fisheries Resource below.

#### *Proposed Well Development (Applies only to Alternative 2)*

As described under Alternative 2, Option 1 for a proposed well development would necessitate authorizing an access route across Forest Service land for equipment to drill a well on private land. In order to drill the well, the permittee would access the private property via a temporary road, using an old existing travel way for alignment. This existing travel way served as the access to this private property, but is no longer used. It may be necessary to remove juniper trees in, or adjacent to the travel way prior to use. Use of this temporary road is only authorized as needed for construction of the well. Any other use is not authorized. The temporary road would be closed after well installation. Any future maintenance would need to be reauthorized.

### *Environmental Consequences*

#### Alternative 1

##### *Soils and Watershed - Direct and Indirect Effects*

Under this alternative, TES units in the higher elevations which are impaired due to shrub encroachment would remain in an impaired state for some time. These TES units may eventually move towards a satisfactory condition with the reintroduction of fire. However, cessation of grazing alone would not result in satisfactory conditions without additional restorative activities.

The impaired TES units that are located in lower elevations and concentrated in the holding pasture would begin to recover and move towards satisfactory conditions. In the absence of grazing, desirable grasses would re-establish in these TES units and excessive erosion would cease. The gullies that have developed in the holding pasture would begin to recover and eventually cease as a source of disproportionate sediment to Sycamore Creek.

Satisfactory TES units would remain in that state and likely improve. No direct or indirect effects are anticipated.



### *Cumulative Effects*

Appendix B contains a list of past, present and reasonably foreseeable future actions or events that were considered in the cumulative effects analysis.

Table 7 in the soil and watershed report displays affected 6th HUC watersheds with watershed and allotment acreage, percent allotment in watershed, and percent watershed occupied by allotment. The primary watersheds being evaluated for cumulative effects are the Sycamore Creek, Little Sycamore Creek, and Bishop Creek watersheds. None of the other three 6th HUC watersheds (Silver Creek, Indian Creek, and Gap Creek-Lower Verde River) have any more than 0.5 percent of their area occupied by the Sycamore Allotment. None of the 6th HUC watersheds contain any impaired or threatened streams according to the most recent compilation by the Arizona Department of Environmental Quality. The watershed with the largest percentage of private land is Sycamore Creek with 5.9 percent. For the purpose of this analysis, only those activities which occur in these 3 watersheds under analysis were considered.

The Sycamore 69kV powerline project acreage was determined based upon a 100-foot corridor for the powerline. This footprint is pre-existing and would not create cumulative effects. The Cave Creek and Pine Mountain Fires areas have mostly recovered and are not contributing to cumulative effects. There was evidence of active erosion from the Cave Creek Fire during the 2007 field season, but during the 2008 sampling none could be found. The Pine Fire occurred mainly in the high elevations of Pine pasture. This area has recovered and is not actively eroding.

The Willow Fence range improvement project acreage is the entire acreage of the adjacent Willow Allotment. This fence improvement would improve watershed conditions through better animal distribution. Both the Willow and Rice Peak livestock grazing authorizations would not detrimentally impact watershed health as they both meet forest standards and guidelines. The proposed Agua Fria Antelope Habitat Improvement Project is to thin juniper and other shrubs to encourage grass growth. There may be some short-term watershed impacts, but the long-term watershed impacts would be beneficial. These activities apply to both alternatives.

Private land ownership is important because management on these parcels is beyond the control of public agencies, and private land is the most likely to be developed for residential or commercial purposes. Developments usually contain asphalt, concrete, and compacted soil surfaces that decrease infiltration, increase runoff, and lead to undesirable watershed conditions. The private land in the watersheds is currently developed at a low intensity; however, there is an 83 lot single family residential subdivision (Sycamore Creek Preserve) that is being planned along Sycamore Creek. A summary of surface ownership is given in Table 8 of the soil and watershed report.

Alternative 1, combined with these past, present and reasonably foreseeable future actions would not have a cumulative effect to the soils and watershed.

### *Streams and Riparian Zones - Direct and Indirect Effects*

All of the examined riparian reaches with critical Gila chub habitat were found to be in functioning condition with the middle reach (reach 2) at functional-at-risk. Under Alternative 1, these reaches would remain in this state and vegetation would move towards the potential plant community. Sedimentation from the gully in holding pasture would begin to decrease as the impacted areas recover; however, this could take several years to occur.

### ***Cumulative Effects***

No direct or indirect impacts are anticipated for this alternative, and there would be no cumulative effects to streams and riparian zones.

### ***Water Quality- Direct and Indirect Effects***

No direct or indirect effects to water quality are anticipated.

### ***Cumulative Effects***

No direct or indirect impacts are anticipated for this alternative, and there would be no cumulative effects to water quality.

## **Alternative 2**

### ***Soils and Watershed - Direct and Indirect Effects***

Under this alternative, impaired TES units in the higher elevations that are experiencing excessive shrub encroachment would continue to be impaired. Altering the grazing regime alone would not change the rating on these units.

The impaired TES units located in lower elevation areas and concentrated in the holding pasture would have beneficial impacts from Alternative 2 and improve and move towards a satisfactory condition. This is primarily due to the fact that grazing would be managed at a conservative rate during the summer growing season and a moderate rate the remainder of the year. Also, more intensive implementation monitoring would be conducted that is specifically geared towards improving conditions in the holding pasture. No direct or indirect adverse impacts to impaired TES units located in lower elevation areas and concentrated in the holding pasture are anticipated from this alternative.

The TES units currently in satisfactory condition would remain that way under this alternative. No direct or indirect adverse impacts are anticipated.

### ***Cumulative Effects***

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

### ***Streams and Riparian Zones - Direct and Indirect Effects***

All of the examined riparian reaches with critical Gila chub habitat were found to be in functioning condition with the middle reach (reach 2) at functional-at-risk. With the same grazing plan under alternative 2, it is expected that the riparian areas would remain in properly functioning condition. Monitoring (see Riparian/Stream Monitoring) will be done to assure this. The riparian zone would see improvement from current conditions with the proposed range structural improvements and reduced watering by livestock in Sycamore Creek.

### ***Cumulative Effects***

Since no direct or indirect impacts are anticipated for this alternative, there would be no cumulative effects.

### ***Proposed Well Development - Direct and Indirect Effects***

There are no anticipated direct effects from the maintenance of the travel way to access the private property. Regardless of where the well is drilled, the amounts of water use specified under Alternative 2

would not likely cause overdraft of the aquifer. Installing a well in the Holocene alluvial bottom on private land could locally reduce streamflows in Sycamore Creek by the amount pumped out, but this would not likely affect the current application for in-stream water rights by the Prescott National Forest (USDA Forest Service, 2009) for Sycamore Creek. The time of year when this would be a concern would be the growing season (May – August) during baseflow conditions. Pasture use would be deferred during the growing season so that there would be no more than 2 months of use within the growing season and 2 months in the dormant season each year.

Livestock grazing in the Loball Pasture would occur in 3 of 4 years with a grazing period of 4-months followed by a year of rest. Adaptive management would determine actual duration of grazing in the pasture. The two additional upland water troughs that will be fed by the well are expected to provide water to about 100 cattle each. The potential trough located in the Hiball pasture is expected to water about 50 cattle for a 4-month period. Given that an adult cow consumes about 12 gallons a day during the cooler dormant season and 15 gallons a day during the growing season, the water demand for 250 cattle is about 405,000 gallons for the 4-month period. This is assuming that 60 days use is in the dormant season, and 60 in the growing season. Cattle had been obtaining water from Sycamore Creek directly when using the pasture in the past. Water consumption at Sycamore Creek would still occur, but with fewer numbers of cattle.

The current application for in-stream water rights in Sycamore Creek is for 97.94 acre-feet of water per year (USDA Forest Service, 2009). The yearly demand for water from the well based on the requirements of 250 cattle for 4-months is 1.24 acre-feet. These numbers are based upon one acre-foot of water equaling 325,851 gallons. This equates to 1.3 percent of the 97.94 in-stream acre-feet during an average year with use split between the growing and dormant season.

Another means of estimating the potential reductions in streamflow is to compare groundwater withdrawal rates to streamflows. Stream flows are commonly reported in cubic feet per second (cfs). For the purpose of this analysis, gallons per minute (gpm) will be used so as to be able to compare the approximate 2-4 gpm that the pump system can remove from the stream channel. The 2-4 gpm estimate was obtained from personal communication with Prescott National Forest Range staff. The Range Staff stated, however, that because of pumping uphill, it is more likely to be closer to 2 gpm (Holloway 2009). The stream flow numbers are those given as the median stream flows for Sycamore Creek from 2001 – 2008 in the application for in-stream water rights (USDA Forest Service, 2009). The point of stream measurements is approximately 2.8 miles downstream of where the proposed well would be located.

As shown in Table 4 below, the amount of potential streamflow reduction would be the most pronounced in June – September when the percentage change with 2 gpm would be 9.8 (June), 12.7 (July), 12.4 (August), and 8.5 (September). Those percentages double under the 4 gpm scenario.

According to Range Staff, groundwater pumping would generally occur for 10 hours a day during the growing seasons and 8 hours a day during the remainder of the year (Holloway 2009). This is because the system would use solar pumps to pull water from the bottoms to the upland stock tanks. These pumps would not be able to run 24 hours a day.

Because Sycamore Creek is a spring-dominated system, potential reductions in streamflows are expected to be localized to the influence zone of the proposed well and downstream. Stream baseflows are derived from groundwater discharge (springs & seeps) originating from local and valley-bottom aquifers upgradient of the proposed well location.

**Table 4. Potential stream drawdown (gallons per minute) for the proposed well**

Month	Median GPM	2 GPM drawdown	Percent Change	4 GPM drawdown	Percent Change
January	96.3	94.3	2.1	92.3	4.2
February	154.2	152.2	1.3	150.2	2.6
March	97.9	95.9	2.0	93.9	4.1
April	112.9	110.9	1.8	108.9	3.5
May	51.6	49.6	3.9	47.6	7.7
June	20.5	18.5	9.8	16.5	19.5
July	15.7	13.7	12.7	11.7	25.5
August	16.2	14.2	12.4	12.2	24.7
September	23.6	21.6	8.5	19.6	17.0
October	40.4	38.4	4.9	36.4	9.9
November	40.4	38.4	4.9	36.4	9.9
December	66.9	64.9	3.0	62.9	6.0

In all likelihood, minimal streamflow reduction is projected to occur on the Prescott National Forest In-stream flow reach. As described in the Mitigation Measures Specific to Alternative 2 section, a piezometer with a pressure transducer to measure stream level would be installed in reach 1 before the well under option 1 is drilled to identify baseline groundwater conditions. In addition, a pump test would be performed following well installation.

### *Cumulative Effects*

There are no anticipated cumulative effects from maintenance of the travelway that goes from Forest Service land onto the private in holding. All appropriate BMPs (appendix A) and mitigation measures specific to Alternative 2 will be implemented.

Taken in the context of other private land development further down Sycamore Creek, the cumulative effects of well development would be minimal. There are no foreseeable plans to increase development intensities on the private land adjacent to the well development. Private land with water development in the Sycamore Creek, Little Sycamore Creek, and Bishop Creek 6th HUC watersheds is developed at a low intensity. A summary of surface ownership is given in Table 8 of the soil and watershed report. Therefore, there is no anticipated further drawdown of the stream from any other adjacent well developments. Regardless of any potential stream drawdown, the Forest Service has existing in-stream water rights in Sycamore Creek, and therefore there would be no cumulative effects as long as pre-existing water rights are maintained.

Although the road density in the area is low, the roads which are present are likely the main sediment source in the Sycamore Allotment. There are several areas where rills had developed on the roadbed, contributing sediment from upper watershed areas to streams. There are also several spots where the roads are concentrating water and forming gullies where water discharges from the road. The entire road system has several areas of concern, but the worst from a watershed standpoint is the Silver Creek road (FR 677). Other than travelway maintenance associated with the proposed well development, no new road development is proposed and thus no cumulative effects are anticipated.

The Pine Fire of 2001 occurred mainly in the high elevations of Pine pasture. This area has recovered and is not actively eroding. There may be some residual sediment in the main stream system from this fire that has not moved out yet. The Cave Creek Fire of 2005 burned over a large section of reach 1, burning riparian vegetation in a few large patches. The trees in this area are being replaced by younger vegetation and the dead trees are falling into the stream and providing coarse woody debris (see Figure 4 in Soils and Watershed report). The Cave Creek Fire has completely healed in the uplands. Therefore, there is no

longer sediment from this fire being deposited into the stream systems. However, sediment from this fire was deposited in the stream system immediately after the fire (2005-2007) and is still in the stream system and working its way out. There was evidence of active erosion from this fire during the 2007 field season, but during the 2008 sampling none could be found. This sediment is still affecting some pools and fisheries habitat, but the fire is not actively contributing excessive sediment to the channel. Although the fire did not burn into the upper watershed in reach 2, some areas of the lower watershed did burn and post fire runoff of sediment was evident in pools within the occupied reach (fisheries report). There are still riparian areas which lost valuable shade trees from this fire, and portions of (i.e., lower 1/3 of reach ) the second proper functioning condition (PFC) reach (reach 2) is adversely affected by residual sediment loads from this fire. No direct or indirect effects to streams and riparian zones are anticipated, thus no cumulative effects would occur.

#### *Water Quality- Direct and Indirect Effects*

No direct or indirect effects to water quality are anticipated.

#### *Cumulative Effects*

No direct or indirect impacts are anticipated for this Alternative, and there would be no cumulative effects to water quality.

## Fisheries Resource

### *Affected Environment*

#### Threatened and Endangered Species and Critical Habitat

A list of threatened and endangered species was assessed for the potential for each species or its habitat to occur within the Sycamore Allotment (Table 1 in fisheries specialist report).

#### *Gila chub*

The Gila chub (*Gila intermedia*) is listed as endangered with critical habitat (USDI 2005b). Gila chub and designated critical habitat occur in Sycamore Creek in the project area (Figure 2). The Sycamore Creek Gila chub population is classified as unstable-threatened based on threats from fire, grazing, and nonnative species (USDI 2005b). Gila chub distribution is limited to a 3 mile reach between the Double T Waterfall downstream to the Rock Bottom Box. Gila chub and rainbow trout occur within this reach as well as nonnative crayfish (Bettaso et al. 1995; USDA 2003b, 2005e). Only rainbow trout occur above the Double T Waterfall. This Gila chub population is considered healthy based on the presence of multiple size classes. The Rock Bottom Box site serves as an effective fish barrier to upstream movement of nonnative fish from lower Sycamore Creek. In addition, there is a 2.5 mile stretch of dry channel below this site before perennial flow is present again in the vicinity of the confluence with Dry Creek. Livestock grazing is very limited in this reach of the creek due to the canyons and inaccessibility to the stream.

Fish collected in the lower reach of Sycamore Creek from near the confluence of Dry Creek downstream to the Forest boundary fence include native desert sucker, longfin dace, and speckled dace and non-native green sunfish and fathead minnow (Bettaso et al. 1995; USDA 2003b, 2005e, 2006b). The sunfish, minnow, and nonnative crayfish are abundant in the stream. Gila chub may occur occasionally in this lower reach of the creek due to displacement from upper reaches during high flow events. However, they are not expected to persist in this lower reach due to the high abundance of nonnative fish that would limit their survival and reproduction. One individual was collected in 2006 near Sycamore cabin, most likely

displaced from upstream from the series of high flood events that occurred in the last year (USDA 2006b). The last previously recorded occurrence of Gila chub in lower Sycamore Creek was in 1980 (Weedman et al. 1996).

### *Gila chub critical habitat*

Critical habitat is a term in the Endangered Species Act (ESA). It identifies geographic areas that contain features essential for the conservation of a threatened or endangered species and may require special management considerations. Consultation with the U.S. Fish and Wildlife Service is required for projects that may impact federally listed species and/or designated critical habitat under the Endangered Species Act.

Gila chub designated critical habitat occurs in Sycamore Creek in the project area (Figure 2). A total of 11.4 miles of Sycamore Creek is designated critical habitat extending from its confluence with Little Sycamore Creek upstream to Nelson Place Spring (at Pine Mountain Wilderness). This creek segment is perennial interrupted with aquatic habitat occurring in three reaches. Occupied critical habitat occurs along 3.0 miles of Sycamore Creek within the Loball Pasture on the Sycamore Allotment. In 2006, this pasture received reduced grazing as a result of low summer 2005 rain on the pasture south of Sycamore Creek that had been burned in the Cave Creek Fire (see Grazing History and Actual use in Vegetation Resource Report). Unoccupied critical habitat occurs along 3.0 miles (includes two private land parcels) of creek from Nelson Place Spring downstream to Double T Waterfall within the Pine Pasture. All Primary Constituent Elements (PCE) (see Glossary) of critical habitat are in place, except habitat devoid of nonnative aquatic species that currently does not allow for survival of Gila chub. The following seven PCEs are considered:

1. Perennial pools, areas of higher velocity between pool areas, and areas of shallow water among plants or eddies all found in headwaters, springs, and cienegas generally of smaller tributaries;
2. Water temperatures for spawning ranging from 17 to 24°C (62.6 to 75.2 °F), and seasonally appropriate temperatures for all life stages (varying from approximately 10 to 30° C (50 to 86°F));
3. Water quality with reduced levels of contaminants, including excessive levels of sediments adverse to Gila chub health, and adequate levels of pH (e.g., ranging from 6.5 to 9.5), dissolved oxygen (e.g., ranging from 3.0 to 10.0) and conductivity (e.g., 100 to 1000 mmhos);
4. Food base consisting of invertebrates (e.g. aquatic and terrestrial insects) and aquatic plants (e.g. diatoms and filamentous green algae);
5. Sufficient cover consisting of downed logs in the water channel, submerged aquatic vegetation, submerged large tree root wads, undercut banks with sufficient overhanging vegetation, large rocks and boulders with overhangs, a high degree of streambank stability, and a healthy, intact riparian vegetation community;
6. Habitat devoid of nonnative aquatic species detrimental to Gila chub or habitat in which detrimental nonnative are kept at a level that allows Gila chub to continue to survive and reproduce; and
7. Streams that maintain a natural flow pattern including periodic flooding.

## Sycamore Creek

Aquatic habitat occurs along Sycamore Creek in the project area. This stream is within the Ash Creek – Sycamore Creek 5th code watershed (soil and watershed report). Sycamore Creek originates at Pine Springs within the Pine Mountain Wilderness on the western side of the Verde Rim. It runs about 20 miles in a southwesterly direction to its confluence with the Agua Fria River near the community of Cordes Junction. There are about 13 miles of stream channel within the boundaries of the Prescott NF. There are about 10 miles of stream channel in the project area. Ownership is primarily forestlands (8 miles) with 4 private land parcels (totaling 2 miles) intermixed throughout this stream segment.

Stream habitat inventories were completed in 2003 and 2008 (USDA 2003b, 2008) along Sycamore Creek based on the Forest Service Region 3 Stream Inventory handbook (USDA 2005d). There are three reaches of perennial interrupted stream that occur within the project area (Figure 2). Riparian-wetland assessments were conducted for the three reaches using the process for assessing proper functioning condition (USDI 2008).

Reach 1 is within the Loball Pasture of the Sycamore Allotment. Total perennial stream length is 0.6 miles. The aquatic habitat is characterized by a sequence of shallow riffle and pool habitats. Substrates are dominated by cobble and boulder with lesser amounts of gravel and sand. Streambanks are stable due to coarse substrate material as well as from rootwads of riparian trees that line the banks. Aquatic habitats have partially filled in with sediments from impacts from the Cave Creek Complex Fire of 2005. In addition, there is a small amount of fine sediment contribution from a gully system in the uplands of the holding pasture (soil and watershed report). There are two road crossings of the creek along FR 677 and the road parallels this reach for most of its length. There is also one motorized trail crossing of the creek by Trail 503 near Dry Creek. There is a small dispersed recreational camping area along the reach but this activity has very limited impacts to the creek. There is a 2.5 mile stretch of dry channel above this reach before perennial flow is present again in reach 2.

A PFC assessment was completed July 9, 2008 and the creek was rated at proper functioning condition (soil and watershed report, appendix 4).

Reach 2 is within the Loball pasture of the Sycamore Allotment. This reach begins at Rock Bottom Box and continues upstream to Double T Ranch. Total stream length is about 3 miles. All of this reach is canyon bound with no road access and no evidence of recreational activities. This reach is perennial-interrupted with only 0.5 miles of perennial water and 2.5 miles of dry channel at base flows. Aquatic habitat in the reach is characterized by three main pool areas separated by dry reaches. Each of these pool areas are located in boxed, bedrock controlled stream channels (figures 3-5 in soil and watershed report). Substrates are dominated by cobble and boulder with lesser amounts of gravel, sand, and bedrock. Streambanks are stable due to coarse substrate material as well as from rootwads of riparian trees that line the banks. Aquatic habitat from the confluence of South Prong downstream is partially filled in with sediments from impacts from the Cave Creek Complex Fire of 2005. There is a 0.5 mile stretch of private land (Double T Ranch) above this reach before the start of reach 3. The main use of the land is for livestock gathering and holding.

A PFC assessment was completed February 13, 2008 and the upper 2/3 of this reach is in PFC; however, the lower 1/3 was rated as functioning at risk condition, with an upward trend because of an increased sediment bedload due to the Cave Creek Complex Fire (soil and watershed report, appendix 4).

Reach 3 is within the Pine pasture of the Sycamore Allotment. This reach begins at Double T Anchor Ranch and continues upstream to Nelson Place Spring. Total stream length is 1.6 miles. This reach is perennial-interrupted with 1.0 mile of perennial water and 0.6 miles of dry channel. Livestock are

excluded from the first mile of creek by fencing, except for one water lane. All of this one mile reach is canyon bound with road access only at the lower and upper ends of the enclosure. Substrates are dominated by cobble and boulder with lesser amounts of gravel, sand, and bedrock. Streambanks are stable due to coarse substrate material as well as from rootwads of riparian trees that line the banks. Salt Flat campground, the trailhead for Pine Mountain Wilderness, and a livestock watering lane are located at the upstream end of the enclosure. There is a low amount of recreational activity in the area and Trail 159 parallels the creek up to Pine Mountain Wilderness. There is a 0.5 mile stretch of unfenced private land above this reach that includes Nelson Place Spring. The 2 miles of creek from above Nelson Place Spring upstream to Pine Springs are typically dry and were not inventoried.

A PFC assessment was completed July 9, 2008 and the creek was rated at proper functioning condition (soil and watershed report, appendix 4).

### Candidate Aquatic Species

A list of candidate aquatic species was assessed for the potential for each species or its habitat to occur within the Sycamore Allotment (table 1 in fisheries specialist report).

#### *Mexican gartersnake*

The Mexican gartersnake (*Thamnophis eques megalops*) is listed as a candidate species (USDI 2008). Species ranges from central Arizona and west central New Mexico south to Mexico at elevations from 130 to 8,497 feet. This species is considered extirpated from the Agua Fria River drainage (USDI 2008). Suitable habitat occurs in all three reaches of Sycamore Creek in the project area. Threats to the species include the presence of non-native crayfish and green sunfish in reach 1 and rainbow trout in reaches 2 and 3.

### Sensitive Aquatic Species

A list of sensitive species was assessed for the potential for each species or its habitat to occur within the Sycamore Allotment (table 1 in fisheries specialist report).

#### *Verde Rim springsnail*

The Verde Rim springsnail (*Pyrgulopsis glandulosa*) occurs at Nelson Place Spring complex in the project area. The total range of this species is the Nelson Place Spring complex that forms the headwaters of Sycamore Creek, Yavapai County, Arizona (AGFD 2003). This occurrence is on private lands within the Pine Pasture and is not fenced from livestock grazing. Threats to the species include wildfire, improper livestock grazing, and recreational activities in reach 3. Population trends are unknown (AGFD 2003).

#### *Desert sucker*

The desert sucker (*Catostomus clarki*) occurs in Sycamore Creek in the project area (USDA 2003b, 2005e, 2008). Occupied habitat only occurs in reach 1 of the creek. Threats to the species include the presence of non-native green sunfish and crayfish. Population trends range-wide are unknown (AGFD 2002).

#### *Longfin dace*

The longfin dace (*Agosia chrysogaster*) occurs in Sycamore Creek in the project area (USDA 2003b, 2005e, 2008). Occupied habitat only occurs in reach 1 of the creek. Threats to the species include the



presence of non-native green sunfish and crayfish. Population trend is declining within Arizona (AGFD 2006).

### *Lowland leopard Frog*

The lowland leopard frog (*Rana yavapaiensis*) occurs in Sycamore Creek in the project area (USDA 2003b, 2005e, 2008; Walters 2006). They have been recorded along the entire reach of Sycamore Creek within the project area. Threats to the species include the presence of non-native green sunfish and crayfish in reach 1 and rainbow trout in reaches 2 and 3. Population trends within central Arizona are stable but declining elsewhere in their range (AGFD 2006).

### *Arizona toad*

No Arizona toad (*Bufo microscaphus*) surveys were conducted in the project area but they have been documented in the project vicinity (Sullivan 1993). Suitable habitat occurs in Sycamore Creek in the project area. Threats to the species include the presence of non-native green sunfish and crayfish in reach 1 and rainbow trout in reaches 2 and 3. Population trends within the state are not well documented (AGFD 2002).

## Management Indicator Species (MIS)

### *Macroinvertebrates*

Macroinvertebrates are the MIS for late seral riparian vegetation and aquatic habitat.

Population trends on the forest are stable and habitat trends are up (USDA 2003a). Macroinvertebrates occur in reaches 1, 2 and 3 of Sycamore Creek in the project area. Water quality ratings in support of the A&Ww (aquatic and wildlife warm-water) designated use classification are used as an indicator of the health of the macroinvertebrate aquatic community in relation to turbidity levels. ADEQ (Arizona Department of Environmental Quality) ratings for Sycamore Creek are Attaining with no exceedances (ADEQ 2008). See also water quality discussion under the soil and watershed section.

## *Environmental Consequences Alternative 1*

### Threatened and Endangered Species and Critical Habitat

#### *Gila chub - Direct and Indirect Effects*

With no livestock grazing in the project area, there would be no direct or indirect effects to Gila chub or their habitat in reach 2.

#### *Cumulative Effects*

With no direct or indirect effects to Gila chub or their occupied habitat, there would be no cumulative effects from this Alternative. There would be no change to population trends of Gila chub or to existing occupied habitat conditions (i.e., pool habitat quantity or quality, streambank stability) in Sycamore Creek. No effect to Gila chub.

#### *Gila chub critical habitat - Direct and Indirect Effects*

With no livestock grazing in the project area, there would be no direct or indirect effects to critical habitat. With no livestock grazing, impaired TES units that are located in lower elevations and concentrated in the holding pasture would begin to recover and moved towards satisfactory conditions in the long-term as a

result of increased vegetative ground cover (soils and watershed report). The gullies in the holding pasture would also recover over time. These soil and watershed improvements would reduce excess sedimentation to reach 1 of Sycamore Creek.

### ***Cumulative Effects***

With no direct and indirect effects to critical habitat, there would be no contribution from this Alternative to the listed cumulative effects considerations in Appendix B. Primary constituent elements of critical habitat in Sycamore Creek would be maintained. No effect to Gila chub critical habitat.

### **Candidate Species**

#### ***Mexican gartersnake - Direct and Indirect Effects***

No direct effects to Mexican gartersnake because populations are considered extirpated in the Agua Fria River drainage including Sycamore Creek (USDI 2008). No indirect effects to species habitat. Existing suitable habitat conditions, primarily hiding and foraging cover in Sycamore Creek would slightly improve as riparian vegetation would move towards its potential plant community in the absence of livestock grazing.

### ***Cumulative Effects***

With no direct effects to Mexican gartersnake or indirect effects to their suitable habitat, there would be no contribution from this Alternative to the listed cumulative effects considerations in Appendix B. No impact to the species.

### **Sensitive Aquatic Species**

#### ***Verde Rim springsnail - Direct and Indirect Effects***

With no livestock grazing in the project area, there would be no direct or indirect effects to these species or their habitat. Existing occupied habitat conditions at Nelson Place Spring in reach 3 of Sycamore Creek would slightly improve as riparian vegetation would move towards its potential plant community in the absence of livestock grazing.

### ***Cumulative Effects***

With no direct and indirect effects to the Verde Rim springsnail and their habitat, there would be no contribution from this Alternative to the listed cumulative effects considerations in Appendix B. No impacts to the species.

#### ***Desert sucker and longfin dace - Direct and Indirect Effects***

With no livestock grazing in the project area, there would be no direct or indirect effects to desert sucker and longfin dace or their habitat in reach 1 of Sycamore Creek. With no livestock grazing, impaired TES units that are located in lower elevations and concentrated in the holding pasture will begin to recover and moved towards satisfactory conditions in the long-term as a result of increased vegetative ground cover (soils and watershed report). The gullies in the holding pasture would also recover over time. These soil and watershed improvements would reduce excess sedimentation to reach 1 of Sycamore Creek.

### *Cumulative Effects*

With no direct and indirect effects to these species or their habitat, there would be no contribution from this Alternative to the listed cumulative effects considerations in Appendix B. No impacts to these species.

### *Arizona toad and lowland leopard frog - Direct and Indirect Effects*

With no livestock grazing in the project area, there would be no direct or indirect effects to these species or their habitat. Existing suitable or occupied habitat conditions, primarily hiding and foraging cover, in Sycamore Creek would slightly improve as riparian vegetation would move towards its potential plant community in the absence of livestock grazing.

### *Cumulative Effects*

With no direct and indirect effects to these species or their habitat, there would be no contribution from this Alternative to the listed cumulative effects considerations in Appendix B. No impacts to these species.

## Management Indicator Species

### *Macroinvertebrates - Direct and Indirect Effects*

With no livestock grazing in the project area, there would be no effects to MIS habitat quantity or quality along Sycamore Creek. With no livestock grazing, impaired TES units that are located in lower elevations and concentrated in the holding pasture will begin to recover and move towards satisfactory conditions in the long-term as a result of increased vegetative ground cover (soils and watershed report). The gullies in the holding pasture would also recover. These soil and watershed improvements would reduce excess sedimentation to reach 1 of Sycamore Creek over time. This would improve habitat quality along 0.6 miles of creek.

### *Summary of Effects*

No effect to the Forest-wide habitat and population trends.

## *Environmental Consequences Alternative 2*

### Threatened and Endangered Species and Critical Habitat

#### *Gila chub - Direct and Indirect Effects*

This Alternative may affect Gila chub because of livestock access to occupied habitat along reach 2 of Sycamore Creek within the Loball pasture. With livestock grazing, there would be access to Sycamore Creek in the Loball pasture 3 of 4 years with a grazing period of 4 months followed by 1 year of rest. In high water flow periods, direct injury to Gila chub in the 3 main pool sites would be unlikely because of water depths and bedrock formations that limit livestock access. In low water flow periods, livestock could access the lower two pool sites which could result in direct injury to Gila chub. However, the intent of the well development and additional waters in the uplands of Loball pasture is to reduce livestock reliance on watering from Sycamore Creek. In addition, monitoring of livestock use and impacts to chub pool habitats would be conducted to reduce their time along the creek.

Effects to Gila chub habitat in Reach 2 from livestock would be from grazing on riparian herbaceous and woody species along the stream, trailing and crossing the stream, and waste products deposited along occupied habitat. However, because of natural stream channel stability and implementation of mitigation measures to minimize effects to species (see mitigation specific to Alternative 2), perennial pool habitat quantity, water quality and streambank stability would be maintained at existing levels.

With the well development along Sycamore Creek, there would be no direct effect to the Gila chub population because this would be located approximately 1.25 miles downstream of occupied habitat in reach 2. The other options for water development would occur in uplands outside of occupied habitat and would not affect perennial flow.

No effects from range structures because they would be constructed outside of occupied habitat.

**Cumulative Effects**

This Alternative, added to the listed cumulative effects considerations in Appendix B, may affect the Gila chub and their habitat. With the implementation of mitigation measures incorporated into Alternative 2, Gila chub populations and their habitat would be maintained.

**Gila chub critical habitat - Direct and Indirect Effects**

This Alternative may affect Gila chub critical habitat because of livestock access along reaches 1-3 of Sycamore Creek within the Loball and Pine pastures and the well development above reach 1. There would be minimal reduction in streamflow in reach 1. With implementation of project design features there would be no change to existing Primary Constituent Elements of critical habitat in reaches 2 and 3.

Table 5 summarizes the direct and indirect effects to Gila chub critical habitat by primary constituent elements (PCE)<sup>5</sup>.

**Table 5. Potential direct and indirect effects to Gila chub critical habitat**

Primary Constituent Elements (PCE)	Direct and Indirect Effects to Gila Chub Critical Habitat
<p><b>PCE 1</b> Perennial pools and other habitat.</p>	<p>-With livestock grazing, there would be access to critical habitat (Loball and Pine pastures; Tule pasture water lane) along Sycamore Creek in 3 of 4 years with a grazing period of 4 months followed by 1 year of rest. Effects to perennial pools/physical habitat would be low because of limited livestock access to the creek due to rough terrain (primarily occupied habitat in reach 2); high streambank stability due to cobble/boulder substrates, rootwads, and areas of bedrock; conservative utilization levels for riparian vegetation in all reaches, and implementation of project design features minimizing effects to habitat.</p> <p>-With the well development on Sycamore Creek, groundwater withdrawal by the well may affect streamflow in reach 1. The amount of water from the well pumped to the uplands would be commensurate with existing livestock grazing consumption from the creek. There would be minimal streamflow reduction to reach 1 (soil and watershed report). The other options for water development would occur in uplands outside of Critical Habitat and would not affect perennial flow.</p>

<sup>5</sup> A Primary Constituent Element is a physical or biological feature essential to the conservation of a species for which its designated or proposed critical habitat is based on (i.e., space, food, cover or shelter, breeding areas) and habitats that are protected from disturbance or are representative of the species’ historic geographic and ecological distribution.

Primary Constituent Elements (PCE)	Direct and Indirect Effects to Gila Chub Critical Habitat
<b>PCE 2</b> Water Temperatures.	Livestock grazing would not alter water temperatures in critical habitat along Sycamore Creek because riparian grazing utilization would maintain or enhance riparian vegetation that would contribute to normal water temperatures through stream shading.
<b>PCE 3</b> Water Quality.	<ul style="list-style-type: none"> <li>-There would be short-term, minor impacts to water quality from livestock waste products from livestock grazing along Sycamore Creek and in the watershed.</li> <li>-Livestock grazing in uplands of Sycamore Creek would maintain or improve soil conditions in satisfactory condition and would not contribute sediments to the creeks above normal levels.</li> <li>- Erosion control structures within the holding pasture would reduce sedimentation to Sycamore Creek. This would have a beneficial effect to 0.6 miles of reach 1.</li> <li>-Currently, water quality assessments are “attaining” for all designated uses for Sycamore Creek (ADEQ 2008).</li> </ul>
<b>PCE 4</b> Food base.	<ul style="list-style-type: none"> <li>-Livestock grazing in critical habitat would not affect food base because the use of riparian grazing utilization would maintain or enhance existing riparian vegetation used by invertebrates and livestock grazing would not contribute to streambank erosion and stream sedimentation that could impact aquatic insects because of high streambank stability.</li> <li>-Livestock grazing in uplands of Sycamore Creek would maintain or improve soil conditions and would not contribute sediments to the creeks above normal levels that could smother aquatic insects and reduce their production and availability.</li> <li>- Erosion control structures within the holding pasture would reduce sedimentation to Sycamore Creek. This would have a beneficial effect to water quality and macroinvertebrate community in 0.6 miles of reach 1.</li> </ul>
<b>PCE 5</b> Stream cover Streambank Stability Riparian health	Livestock grazing in critical habitat would not alter cover and would maintain an intact riparian vegetation community because of high streambank stability and the use of riparian grazing utilization that would maintain or enhance existing riparian vegetation.
<b>PCE 6</b> Non-native Species.	Livestock grazing activities would not alter the level of non-native aquatic species present in the creek. Green sunfish, fathead minnow, and crayfish are present in reach 1. Non-native species in reach 1 appear to be a major limiting factor in existence of a Gila chub population. Rainbow trout are present in reach 2 and 3.
<b>PCE 7</b> Natural flow pattern.	<ul style="list-style-type: none"> <li>-Livestock grazing in critical habitat would not impact natural flow patterns including periodic flooding.</li> <li>-Well development would not impact occupied habitat because it would occur 1.25 miles downstream of reach 2 in a dry channel area.</li> <li>- With the well development on Sycamore Creek, groundwater withdrawal by the well may affect streamflow in reach 1. The amount of water from the well pumped to the uplands would be commensurate with existing livestock grazing consumption from the creek. There would be minimal streamflow reduction to reach 1 (soil and watershed report). The other options for water development would occur in uplands outside of critical habitat and would not affect perennial flow.</li> </ul>

**Cumulative Effects**

This Alternative added to the listed cumulative effects considerations in Appendix B may affect, and is likely to adversely affect Gila chub critical habitat.

## Candidate Species

### *Mexican gartersnake - Direct and Indirect Effects*

With livestock grazing, no direct effect to species is anticipated because it is considered extirpated from the Agua Fria River drainage (USDI 2008).

With livestock grazing, there would be access to suitable habitat in the Loball and Pine Pastures along Sycamore Creek in 3 of 4 years with a grazing period of 4 months followed by 1 year of rest. Effects to suitable habitat in all reaches would be low because of high streambank stability due to cobble/boulder substrates, rootwads, and areas of bedrock; conservative utilization levels for riparian vegetation; and implementation of project design features minimizing effects to Sycamore Creek.

Well development on Sycamore Creek would have minimal streamflow reduction to reach 1. Level of water use from the well development pumped to the uplands would be commensurate with existing livestock water consumption from the creek. The other options for water development would occur in uplands outside of suitable habitat.

Erosion control structures within the holding pasture would reduce sedimentation to Sycamore Creek. This would have a beneficial effect to suitable habitat in reach 1.

Expanding the Tule and Double T corrals and installing the cattleguard would have no effects to this species.

### *Cumulative Effects*

With no direct effect to species and indirect effects to suitable habitat, there would be no contribution from this project to the listed cumulative effects considerations in Appendix B. There would be no impact to the species.

## Sensitive Aquatic Species

### *Verde Rim springsnail - Direct and Indirect Effects*

With livestock grazing, there would be access to occupied habitat at Nelson Place spring complex along Sycamore Creek in the Pine pasture in 3 of 4 years with a grazing period of 4 months followed by 1 year of rest. Effects to springsnail in reach 3 would be low because of conservative utilization levels for riparian vegetation (i.e., 20 percent relative use of current year's production on selected key riparian woody species).

Well development on Sycamore Creek, erosion control structures in the holding pasture, expanding the Tule and Double T corrals, and installing the cattleguard would have no effects to this species because they occur outside of reach 3.

### *Cumulative Effects*

This Alternative added to the listed cumulative effects considerations in Appendix B may impact individuals of Verde Rim springsnail, but is not likely to result in a trend toward federal listing or loss of viability.

### *Desert sucker and longfin Dace - Direct and Indirect Effects*

With livestock grazing, there are potential direct effects to species from disturbance or injury with livestock walking in the creek in shallow water areas. Currently, populations exhibit good abundance and

varied age classes. There would be access to reach 1 of Sycamore Creek in the Loball pasture 3 of 4 years with a grazing period of 4 months followed by 1 year of rest. Effects to species habitat would be low because of high streambank stability due to cobble/boulder substrates, rootwads, and areas of bedrock; conservative utilization levels for riparian vegetation; and implementation of project design features minimizing effects to Sycamore Creek. Overall, there would be no change to existing fish populations or habitat conditions.

Well development on Sycamore Creek would have minimal streamflow reduction to reach 1. Level of water use from the well development pumped to the uplands would be commensurate with existing livestock water consumption from the creek. The other options for water development would occur in uplands outside of occupied habitat.

Erosion control structures within the holding pasture would reduce sedimentation to Sycamore Creek. This would have a beneficial effect to aquatic habitat in reach 1. Expanding the Tule and Double T corrals and installing the cattleguard would have no effects to these fish species.

### ***Cumulative Effects***

This Alternative added to the listed cumulative effects considerations in Appendix B may impact individuals of desert sucker and longfin dace, but is not likely to result in a trend toward federal listing or loss of viability.

### ***Arizona toad and lowland leopard frog - Direct and Indirect Effects***

With livestock grazing, there is the potential for disturbance or injury of amphibians with livestock trailing along the streambanks or walking in the creek in shallow areas. Currently, populations of lowland leopard frogs exhibit good abundance and varied age classes. With livestock grazing, there would be access to species habitat in the Loball and Pine pastures along Sycamore Creek in 3 of 4 years with a grazing period of 4 months followed by 1 year of rest. Effects to species habitat would be low because of high streambank stability due to cobble/boulder substrates, rootwads, and areas of bedrock; conservative utilization levels for riparian vegetation; and implementation of mitigation and BMPs minimizing effects to Sycamore Creek.

Well development on Sycamore Creek would have minimal streamflow reduction to reach 1. Level of water use from the well development pumped to the uplands would be commensurate with existing livestock water consumption from the creek. The other options for water development would occur in uplands outside of occupied habitat.

Erosion control structures within the holding pasture would reduce sedimentation to Sycamore Creek. This would have a beneficial effect to aquatic habitat reach 1. Expanding the Tule and Double T corrals and installing the cattleguard would have no effects to these amphibian species.

### ***Cumulative Effects***

This alternative added to the listed cumulative effects considerations in Appendix B may impact individuals of Arizona toad or lowland leopard frog, but is not likely to result in a trend toward federal listing or loss of viability.

## Management Indicator Species

### *Macroinvertebrates - Direct and Indirect Effects*

With livestock grazing, there would be access to habitat in the Loball and Pine pastures along Sycamore Creek in 3 of 4 years with a grazing period of 4 months followed by 1 year of rest. There would be no effect to habitat quantity because of the following factors: high streambank stability due to cobble/boulder substrates, rootwads, and areas of bedrock; conservative utilization levels for riparian vegetation; and implementation of mitigation and BMPs minimizing effects to Sycamore Creek.

Ongoing livestock grazing in the project area has been documented as not affecting the macroinvertebrate community in Sycamore Creek (ADEQ 2008).

Well development on Sycamore Creek would have minimal streamflow reduction to reach 1. Level of water use from the well development pumped to the uplands would be commensurate with existing livestock water consumption from the creek. The other options for water development would occur in uplands outside of MIS habitat.

Erosion control structures within the holding pasture would reduce sedimentation to Sycamore Creek. This would have a beneficial effect to MIS habitat quality in reach 1. Expanding the Tule and Double T corrals and installing the cattleguard would have no effects to MIS habitat.

### Summary of Effects

There would be no effect to forest-wide population or habitat trends.

## Wildlife Resource

### *Affected Environment*

#### Threatened and Endangered Species

A list of threatened and endangered species was assessed for the potential for each species or its habitat to occur within the Sycamore Allotment (Table 1 in terrestrial wildlife specialist report).

#### *Mexican spotted owl*

The Mexican spotted owl (*Strix occidentalis lucida*) has never been documented within the allotment although surveys were done in 1993, 1994, and 1995 when the majority of the Mexican spotted owl on the Prescott National Forest were first detected. The nearest confirmed documented occurrence of a Mexican spotted owl is 27 miles to the west on Towers Mountain (map 9 in terrestrial wildlife specialist report), just north of Crown King. While the Pine Mountain Wilderness is technically considered "protected habitat" by virtue of its designation as wilderness, the vegetation within the wilderness does not necessarily have the required vegetative structure and features for quality Mexican spotted owl nesting or roosting habitat. The vegetation within the Pine Mountain Wilderness was assessed using the terrestrial ecosystem survey (TES) in a forest-wide assessment and 935 acres were identified as having the vegetative characteristics of "restricted" pine/oak habitat for the Mexican spotted owl. The key physical characteristics of restricted habitat are large trees and basal area of Gambel oak. The blocks of restricted habitat occur in 9 different polygons ranging in size from 16 acres to 362 acres (map 2 in Terrestrial Wildlife Specialist Report) and the lie on the steep side slopes in the wilderness area. Although no critical habitat occurs within or adjacent to the project area, the small ribbons of riparian vegetation along the drainages within the allotment are "restricted" Mexican spotted owl habitat. Prey species habitat



is typically contingent upon the habitat surrounding the nesting habitat and can vary from grasses, shrubs and forbs to rock outcroppings and down woody material.

### Candidate Species

A list of candidate species was assessed for the potential for each species or its habitat to occur within the Sycamore Allotment (Table 1 in terrestrial wildlife specialist report).

#### *Western yellow-billed cuckoo*

The western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is thought to occur in Sycamore Creek within the Loball pasture of the Sycamore Allotment (map 3 in terrestrial wildlife specialist report), and has been documented as breeding in the Agua Fria important bird area (IBA).

The key habitat components of western yellow-billed cuckoo nesting habitat are the broad-leaved riparian over and mid story vegetation. Primary prey species would be tent caterpillars and cicadas that would be expected to occur in mid to upper story riparian vegetation. Other prey items to include lizards, frogs, berries, fruit, and a few bird eggs would be associated with more understory vegetation and aquatic habitat.

### Sensitive Species

A list of sensitive species was assessed for the potential for each species or its habitat to occur within the Sycamore Allotment (Table 1 in terrestrial wildlife specialist report).

#### *Northern goshawk*

Northern goshawk (*Accipiter gentilis*) and Mexican spotted owl have similar nesting habitat requirements and different foraging habitat requirements. The Mexican spotted owl restricted pine/oak may provide suitable nesting habitat for northern goshawks. Habitat for goshawk prey species is typically grasses, forbs, and shrubs in the understory of a ponderosa pine forest (Table 1 in terrestrial wildlife specialist report). The existing condition for the ponderosa pine vegetation type is good species and structural diversity among the trees, shrubs, and grasses. Grass cover for prey species is inversely proportional to the tree canopy cover and not limited by grazing (see vegetation resource report).

#### *Eastwood alumroot*

Approximately 15 Eastwood alumroot (*Heuchera eastwoodiae*) plants were located in the Loball pasture along a northerly facing granite outcrop (map 4 in terrestrial wildlife specialist report). Some plants were growing out of the bedrock although most were growing in silty sandy soils and leaf litter at the base of boulders on slopes about 20 degrees (Envirosystems, 2003).

#### *Common black hawk*

Common black hawk (*Buteogallus anthracinus*) are known to occur along Sycamore Creek within the Allotment (map 5 in terrestrial wildlife specialist report) and has been documented as breeding in the Agua Fria IBA. These hawks nest in mature riparian hardwoods and forage on primarily aquatic species and riparian reptiles.

#### *Abert's towhee*

Abert's towhee (*Pipilo aberti*) would be expected to occur in the dense riparian understory along Sycamore Creek and has been documented as breeding in the Agua Fria IBA.

## **Bats**

Several species of bats would be expected to occur along Sycamore Creek roosting in the riparian broad-leaved overstory trees or in rock crevices in the walls along the creek. These bats are insectivorous and feed primarily on moths and other insects. The western red bat (*Lasiurus blossevillii*) is associated with broad-leaf deciduous riparian forests and woodlands, and roosts by day in trees. The pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*) uses abandoned mines or caves for roosting habitat. The pocket free-tailed bat (*Nyctinomops femorosaccus*) is found in arid lower elevations usually around high cliffs and rugged rock outcrops, roosts in crevices during the day and may also use human built structures.

## **Management Indicator Species (MIS)**

Management Indicator Species (MIS) are animals or plants identified in the Forest Plan, developed under the 1982 Planning Rule that are selected because their population changes are thought to indicate the effects of Forest Service management activities.

MIS known to occur within the project area include pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), and turkeys (*Meleagris gallopavo*). MIS for which habitat occurs and the species are likely to be found in the allotment include Lucy's warbler (*Vermivora luciae*), juniper titmouse (*Baeolophus ridgwayi*), pygmy nuthatch (*Sitta pygmaea*), hairy woodpecker (*Picoides villosus*), Abert's squirrel (*Sciurus aberti*), and spotted towhee (*Pipilo maculatus*).

### **Pronghorn**

Pronghorn habitat within the allotment occurs in the holding pasture, which has been used for pronghorn fawning (Warnecke 2008). The Black Hills area on the east side of the Tule pasture was determined not to be suitable pronghorn habitat (Ockenfels, et al. 1996).

### **Mule Deer**

This is the MIS for early seral stage pinyon-juniper and chaparral vegetation types. According to the AGFD (Fousek 2008), the mule deer population trend on the Prescott National Forest portion of GMU 21 is swinging slightly upward in the Sycamore Allotment area.

### **Turkey**

This is a MIS for late seral stage ponderosa pine vegetation type. The AGFD are transplanting wild turkeys in the Pine Mountain area with the intent of establishing a breeding population (Fousek 2008) (map 6 in terrestrial wildlife specialist report).

### **Lucy's warbler**

This is the MIS for late seral riparian habitat. It is a secondary cavity nester. Suitable habitat occurs for this species within the allotment along Sycamore Creek. This species has been documented breeding in the adjacent Agua Fria IBA.

### **Juniper titmouse**

This species has been documented breeding on the adjacent Agua Fria IBA. This is the MIS for late seral stage pinyon-juniper vegetation type and the snag component within pinyon-juniper vegetation type.

*Pygmy nuthatch*

This is a MIS for late seral stage ponderosa pine vegetation type, which occurs in the Sycamore Allotment.

*Hairy woodpecker*

This is the MIS for snag component in ponderosa pine vegetation type, which occurs within the Sycamore Allotment.

*Abert's squirrel*

This is the MIS for early seral stage ponderosa pine vegetation type, which occurs within the Sycamore Allotment.

*Spotted towhee*

This is the MIS for late seral stage chaparral vegetation type. The spotted towhee has been documented as breeding in the Agua Fria IBA.

Table 6 shows the existing condition of habitat and current population trends for associated MIS in the Sycamore Allotment.

**Table 6. Existing condition of habitat and current population trends for associated MIS in the Sycamore Allotment**

Vegetation type	% Allotment Approximate acres	Seral stages	Vegetative Existing condition	Associated MIS (Current population trend <sup>a</sup> )
<b>Pinyon Juniper</b>	77% 21,651 acres	Various	0-15% slope – similar to TES potential 16-39% & >40% slope – Similarity to TES potential influenced by canopy density as impacted by fires or lack of fires	Early Seral: mule deer (decreasing) Late Seral & snag: Juniper titmouse (unknown)
<b>Ponderosa Pine</b>	15% 4,218 acres	Various	Essentially good species & structural diversity in trees, shrubs and grasses, with grass cover inversely relative to tree cover	Early Seral: Abert's squirrel (Unknown) Late Seral: Goshawk (unknown), turkey (increasing), pygmy nuthatch (stable) Snag: hairy woodpecker (stable)
<b>Grassland</b>	2% 562 acres	NA	Highly similar to TES potential	Pronghorn (Antelope) (declining)
<b>Grassland w/ shrub</b>	<1% 281 acres	NA	Highly similar to TES potential	Pronghorn (Antelope) (declining)
<b>Chaparral</b>	3% 843 acres	Various	Mostly on slopes >40% - Highly similar to TES potential	Early seral: mule deer (decreasing) Late seral: spotted (rufous-sided) towhee (unknown)
<b>Riparian</b>	3% 843 acres	Various	Vegetation ranges from very good to fair.	Late seral: Lucy's warbler (unknown)

a- **Increasing** - Survey results indicate that population numbers appear to be increasing; **Decreasing** or **Declining** - Survey results indicate a trend for population numbers becoming lower each year; **Stable** - Survey results indicate that population numbers are neither increasing nor decreasing; **Unknown** - Not enough data to determine any kind of trend for the population

Table 1 in the terrestrial wildlife specialist report provides more detailed information about the known distribution and habitat association for these MIS species.

### Wildlife of Special Concern

Wildlife of special concern in Arizona are species whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines, as described by the Arizona Game and Fish Department's listing of wildlife of special concern in Arizona.

#### *Belted kingfisher*

Belted kingfishers (*Ceryle alcyon*) have been observed within the Sycamore Allotment. This species typically nests in cavities in dirt stream banks or occasionally in tree cavities and forages on fish and other aquatic species.

#### *Ferruginous hawk*

Ferruginous hawks (*Buteo regalis*) would be expected to forage in the open grassland habitat and nest in adjacent juniper habitat. Prey species' habitat is primarily grassland vegetation. The current condition is highly similar to the TES potential for both canopy cover and species diversity.

Table 1 in the terrestrial wildlife specialist report provides more detailed information about the known distribution or habitat association for these species.

### Migratory birds

A total of 94 species of migratory birds were assessed for their potential to occur on the Prescott National Forest in the Prescott National Forest Working Draft Migratory Bird Report (July 2009). An extensive list of migratory birds from Birds of Conservation Concern (BOCC), Partners in Flight (PIF), and the current Forest Plan revision Species of Interest / Species of Concern (SOI/SOC) species lists was reviewed for species to assess or consider in the analysis of this project.

Thirty-five species of migratory birds are expected to occur on the Prescott National Forest, 13 of which have status as federally listed, Forest Service sensitive, or MIS (table 2 in terrestrial wildlife specialist report). Eight of those 13 species are expected to occur within the Sycamore Allotment and have been assessed per their respective status. Twenty-two non-status migratory bird species were listed as passing through, non-breeding, or breeding on the adjacent Agua Fria IBA (see Table 3 in terrestrial wildlife specialist report). Another 6 species of migratory birds could possibly occur within the Sycamore Allotment simply by association with vegetation types that occur within the allotment. These 35 species of migratory birds potentially occurring on the allotment represent all of the various vegetation types from ponderosa pine to desert scrub and grassland to pinyon-juniper, chaparral, and riparian. Existing conditions for these vegetation types is described in Table .

#### *Agua Fria Important Bird Area*

The Agua Fria IBA is approximately 2 miles from the project boundary. For the Agua Fria IBA, water diversion or water level changes have been identified as a conservation issue for the IBA. Diverting water from their natural channels could impact the riparian habitat within the IBA.

Table 1 in the terrestrial wildlife specialist report provides more detailed information about the known distribution or habitat association for migratory birds.

## *Environmental Consequences Alternative 1*

### Threatened and Endangered Species

#### *Mexican spotted owl - Direct and Indirect Effects*

With no livestock grazing within the allotment, there would not be any direct effects to any threatened and endangered species as nothing would directly come in contact with them.

The Mexican spotted owl has never been documented within the allotment. The nearest confirmed documented occurrence of a Mexican spotted owl is 27 miles to the west on Towers Mountain (see map 9 in wildlife resource report), just north of Crown King. While the Pine Mountain Wilderness is technically considered protected habitat by virtue of its designation as wilderness, the vegetation within the wilderness does not necessarily have the required vegetative structure and features for quality Mexican spotted owl nesting or roosting habitat. With no actions occurring with this alternative, there would be no discernible changes in the vegetative structure of the pine/oak restricted habitat or the down woody prey species habitat, and thus no direct or indirect impacts. Riparian habitat and vegetative prey species habitat would be expected to improve in the absence of livestock grazing with the expected increase in herbaceous production, litter accumulation, and woody species recruitment. With no owls known to occur in or use the allotment, there would be no direct or indirect effects to Mexican spotted owl from this alternative.

#### *Cumulative Effects*

With no anticipated direct or indirect impacts to the Mexican spotted owl or its habitat, there would be no contribution to any cumulative effects.

### Candidate Species

#### *Western yellow-billed cuckoo - Direct and Indirect Effects*

With no livestock grazing occurring in this alternative, anticipated beneficial impacts would include improvement in quality of the riparian habitat used for nesting and foraging by the western yellow-billed cuckoo and is also expected to improve in quality with increases in herbaceous production and woody recruitment. With only a possible sighting of one bird in the allotment and the relatively small patch of suitable habitat within the project area, there is potential for a pair to occupy the suitable habitat.

#### *Cumulative Effects*

With no anticipated direct or indirect adverse effects to the western yellow-billed cuckoo or its habitat, there would be no contribution to any cumulative effects.

### Sensitive Species

#### *Northern goshawk- Direct and Indirect Effects*

With no actions occurring in the alternative, the vegetative structure used by northern goshawks for nesting would not be impacted. Beneficial impacts may include improved prey species habitat for small mammals and passerine birds as this is expected to improve with no livestock grazing. With no known goshawks in the allotment, there would not be any expected direct or indirect impacts to goshawks from this alternative.

### *Cumulative Effects*

With no direct or indirect effects to the northern goshawk or their habitat, there would be no contribution to any cumulative effects.

### *Eastwood alumroot- Direct and Indirect Effects*

With no livestock grazing occurring within the project area, there would not be any direct or indirect effects to Eastwood alumroot habitat. The granite outcrop and sandy soils at the base of the slope are not expected to change from lack of grazing.

### *Cumulative Effects*

With no anticipated direct or indirect effects to Eastwood alumroot habitat, there would be no contribution to any cumulative effects.

### *Common black hawk – Direct and Indirect Effects*

Common black hawks are known to occur along Sycamore Creek within the allotment. These hawks nest in mature riparian hardwoods and forage on primarily aquatic species and riparian reptiles. Lack of livestock grazing would not impact this species' nesting habitat or its aquatic prey habitat as riparian vegetation moves toward potential and aquatic habitats are expected to remain the same.

### *Cumulative Effects*

With no anticipated direct or indirect effects to the common black hawk and its habitat, there would be no contribution to any cumulative effects.

### *Abert's towhee- Direct and Indirect Effects*

Lack of livestock grazing would not have any direct or indirect effects to Abert's towhee or the physical structure of its habitat as riparian vegetation moves toward potential with increases in herbaceous production, litter accumulation, and woody species recruitment.

### *Cumulative Effects*

With no direct or indirect effects to Abert's towhee or their habitat, there would be no contribution to any cumulative effects.

### *Bats – Direct and Indirect Effects*

Lack of livestock grazing would have no direct or indirect effects on bats or their habitat, and would not impact moth abundance.

### *Cumulative Effects*

With no direct or indirect effects to bats, their habitat or food source, there would be no contribution to any cumulative effects.

## Management Indicator Species

### *Pronghorn- Direct and Indirect Effects*

Key factors for pronghorn fawning are suitable fawning cover, forb component of available forage, and proximity between water and food. With no livestock grazing in the alternative, pronghorn fawning habitat would be adequate as the vegetation height would likely exceed 8 inches for fawning hiding cover.

Given that the fawning site in the Holding Pasture is not a key site for the pronghorn population (Warnecke 2008) there would not be any discernible impacts to the population.

Table 7 includes the anticipated direct and indirect effects to MIS, their habitat and population trends.

**Table 7. Anticipated direct and indirect effects to MIS, their habitat and population trends**

<b>Vegetation type</b>	<b>Expected Effects to Vegetation for Alternative 1</b>	<b>Anticipated impacts to MIS habitat and population trends</b>
<b>Pinyon Juniper</b>	There would not be an appreciable change in cover in grass or shrub.	Early Seral: mule deer - No impact to habitat or population trends Late Seral & snag: Juniper titmouse - No impact to habitat or population trends
<b>Ponderosa Pine</b>	No expected change would occur in herbaceous ground cover or tree component structure.	Early Seral: Abert's squirrel - No impact to habitat or population trends Late Seral: Goshawk, turkey, pygmy nuthatch - No impact to habitat or population trends Snag: hairy woodpecker - No impact to habitat or population trends
<b>Grassland</b>	Increase in vegetative ground cover and perennial grass species diversity would occur where limited by grazing	Pronghorn (Antelope) – Providing fawning habitat in an area that is not key to the population (Warnecke 2008) would not impact the population trend for pronghorn on the Prescott National Forest. Maintaining 160 acres of fawning habitat would not change the habitat trend for the species on the Forest.
<b>Grassland w/ shrub</b>	Increase in vegetative ground cover and perennial grass species diversity would occur where limited by grazing	Pronghorn (Antelope) – No impact to habitat or population trends.
<b>Late seral riparian</b>	No expected change would occur in riparian tree component structure.	Late seral: Lucy's warbler – no impact to habitat or population trends

**Cumulative Effects**

With no direct or indirect effects to MIS, their habitat and population trends, there would be no contribution to any cumulative effects.

**Wildlife of Special Concern**

**Belted kingfisher- Direct and Indirect Effects**

The belted kingfisher is known to occur within the allotment. Lack of livestock grazing along Sycamore Creek would not have any discernible impacts on kingfishers or their habitats or their prey.

**Cumulative Effects**

With no direct or indirect effects to the belted kingfisher or their habitats, there would be no contribution to any cumulative effects.

**Ferruginous hawk- Direct and Indirect Effects**

Ferruginous hawks would be expected to forage in the open grassland habitat within the allotment. Lack of livestock grazing in this alternative could create beneficial effects by improving prey species habitat

for small mammals with the increase of perennial grass species diversity. No direct or indirect adverse effects are anticipated.

### *Cumulative Effects*

With no anticipated adverse direct or indirect effects to ferruginous hawks or their prey habitat, there would be no contribution to any cumulative effects.

## **Migratory Birds**

### *Migratory Birds - Direct and Indirect Effects*

With no livestock grazing within the project area, physical habitat characteristics for migratory bird species associated with the grassland and riparian habitats would be expected to improve with the expected effects listed above for MIS. The physical habitat features for those species associated with the forested habitat types, the chaparral, and the pinyon juniper vegetation types would not be expected to change with the lack of livestock grazing. No direct or indirect effects are anticipated.

### *Cumulative Effects*

With no anticipated direct or indirect effects to migratory birds or their habitat, there would be no contribution to any cumulative effects.

### *Agua Fria Important Bird Area - Direct and Indirect Effects*

The Agua Fria IBA immediately adjacent to the Forest boundary downstream from the project area (map 8 in wildlife resource report) would not likely be impacted by the lack of livestock grazing in this alternative. No direct or indirect effects to the Agua Fria IBA are anticipated.

### *Cumulative Effects*

With no anticipated direct or indirect effects anticipated to the Agua Fria IBA under this alternative, there would be no contribution to any cumulative effects.

## **Environmental Consequences Alternative 2**

### **Threatened and Endangered Species**

#### *Mexican spotted owl - Direct and Indirect Effects*

Considering that the Mexican spotted owl is not known to occur within the project area and the nature of the proposed actions under Alternative 2, there would not be any direct effects to this species. The key physical characteristics of restricted habitat are large trees and basal area of Gambel oak. Neither of these features would be impacted by the livestock grazing proposed in this project. The location of the restricted habitat lies on steep side slopes in the wilderness area. Livestock access and use of this area is minimal and there would not be any direct impacts from livestock to these nesting and roosting habitat features. The Mexican spotted owl habitat component with the potential to be impacted by livestock grazing would be prey species habitat for small mammals and passerine birds. The small ribbons of riparian vegetation along the drainages within the allotment are also "restricted" Mexican spotted owl habitat. Although there are livestock grazing actions occurring with this alternative, there would not be any discernible changes in the vegetative structure of the pine/oak restricted habitat. Prey species habitat comprised of grasses, forbs and shrubs would be expected to be maintained or improved with the proposed grazing levels and the shifting seasons of use each year and the rest one year in four. Riparian



habitat would be expected to stay the same or improve with the proposed levels of livestock grazing and the deferred rest-rotation system. With no owls known to occur in, or to use the Sycamore Allotment, there would not be any indirect effects to Mexican spotted owl from this alternative.

### *Cumulative Effects*

With no anticipated direct or indirect impacts to the Mexican spotted owl or its habitat, there would be no contribution to any cumulative effects.

## Candidate Species

### *Western yellow-billed cuckoo – Direct and Indirect Effects*

Essentially, there is no expectation that any livestock grazing in the Sycamore Allotment would have any direct contact or effect the western yellow-billed cuckoo within the allotment. The key habitat components of western yellow-billed cuckoo habitat are the broad-leafed riparian over and mid story vegetation for the nesting and foraging habitat they provide. Livestock grazing would occur in the Loball pasture for a grazing period of up to 4 months per year followed by a year of rest. Summer grazing could occur 1 year in 3 or 4. Adaptive management would determine the duration of grazing in the pasture. The proposed well would provide drinking sources for livestock away from Sycamore Creek. Both the timing of use and the distribution of livestock would contribute to reducing livestock impacts to riparian habitat resources. This would lead to maintaining or improving habitat for western yellow-billed cuckoo and its prey through woody riparian recruitment and herbaceous riparian vegetation production. Given that this habitat would only influence possibly an individual or a pair of western yellow-billed cuckoo at the most, improving this habitat would not have any effects to the species.

### *Cumulative Effects*

With no anticipated direct or indirect adverse effects to the western yellow-billed cuckoo or its habitat, there would be no contribution to any cumulative effects.

## Sensitive Species

### *Northern goshawk- Direct and Indirect Effects*

Considering that the northern goshawk is not known to occur within the Sycamore Allotment and the nature of the proposed actions, there would not be any direct effects to these species from this alternative. The pine/oak habitat may provide suitable nesting habitat for northern goshawks. Although there are livestock grazing actions occurring with this alternative, there would not be any impacts to the vegetative structure of the pine/oak habitat. Prey species habitat comprised of grasses, forbs and shrubs would be expected to be maintained or improved with the proposed grazing levels and deferred rest-rotation system. With no known goshawks in the allotment, there would not be any expected direct or indirect effects to goshawks from this alternative.

### *Cumulative Effects*

With no anticipated direct or indirect effects to the northern goshawk or their habitat, there would be no contribution to any cumulative effects.

### *Eastwood Alumroot - Direct and Indirect Effects*

Individual Eastwood alumroot plants may be directly trampled by livestock. However, considering that Loball pasture would be used during the growing season only once every 3-4 years, and the location of

the population is associated with a granite outcrop, it is not likely that livestock grazing activities would have any discernible impacts to the population of this species due to limited access from timing and topography.

#### *Cumulative Effects*

Although individual plants could be directly impacted by livestock trampling, these direct impacts would be very limited, and there would be no contribution to any cumulative effects.

#### *Common black hawk - Direct and Indirect Effects*

Common black hawks are known to occur along Sycamore Creek within the allotment. These hawks nest in mature riparian hardwoods and forage on primarily aquatic species and riparian reptiles. Livestock grazing would not impact this species' nesting habitat as the proposed grazing actions in this alternative would provide for recruitment of woody riparian species to replace nesting habitat. The aquatic prey habitat would be maintained or improved as riparian conditions are maintained or improved.

#### *Cumulative Effects*

With no anticipated direct or indirect effects to the common black hawk or their habitat, there would be no contribution to any cumulative effects.

#### *Abert's Towhee - Direct and Indirect Effects*

Abert's towhee would be expected to occur in the dense riparian understory along Sycamore Creek. The proposed levels of livestock grazing would maintain or improve the existing riparian vegetative conditions and therefore would not have any direct or indirect impacts to this species or the physical structure of its habitat.

#### *Cumulative Effects*

With no anticipated direct or indirect effects to Abert's towhee or their habitat, there would be no contribution to any cumulative effects.

#### *Bats – Direct and Indirect Effects*

This alternative would have no direct or indirect effects on bats or their habitat, and would not impact moth abundance.

#### *Cumulative Effects*

With no direct or indirect effects to bats, their habitat or food source, there would be no contribution to any cumulative effects.

### **Management Indicator Species**

#### *Management Indicator Species - Direct and Indirect Effects*

#### **Pronghorn**

This alternative proposes mitigation to provide pronghorn fawning cover in the small mesa portion in the southern part of the holding pasture (approximately 160 acres), by grazing at conservative use levels to an average height of 7 to 9 inches during the pronghorn fawning period of March-May each year (see mitigation measures specific to Alternative 2). This may protect some individual fawns and provide for their survival in as much as that factor influences survival. The success or failure of fawning in the

holding pasture is not substantial enough to influence the population trend for the game management unit (GMU) 21 population or on the Forest. However, the quantity of habitat would be maintained and the quality would possibly be improved.

**Other MIS**

For the mule deer, turkey, Lucy's warbler, juniper titmouse, pygmy nuthatch, hairy woodpecker, Abert's squirrel, and spotted towhee, livestock grazing in the project area would not change the seral stages for any of the representative vegetation types for these species or impact species use of the habitats. This alternative would not impact the habitat or the population trends for these MIS species. Table 8 summarizes the anticipated direct and indirect effects to MIS, their habitat and population trends.

**Table 8. Anticipated direct and indirect effects to MIS, their habitat and population trends**

<b>Vegetation type</b>	<b>Expected Effects to Vegetation for Alternative 2</b>	<b>Expected impacts to MIS habitat and population trends</b>
<b>Pinyon Juniper</b>	There would not be an appreciable change in cover in grass or shrub under either alternative.	Early Seral: mule deer (decreasing) - No impact to habitat or population trends Late Seral & snag: Juniper (plain) titmouse (unknown) - No impact to habitat or population trends
<b>Ponderosa Pine</b>	No expected change in herbaceous ground cover.	Early Seral: Abert's squirrel (Unknown) - No impact to habitat or population trends Late Seral: Goshawk (unknown), turkey (increasing), pygmy nuthatch (stable) - No impact to habitat or population trends Snag: hairy woodpecker (stable) - No impact to habitat or population trends
<b>Grassland</b>	Acceptable ground cover and diversity would continue.	Pronghorn (Antelope) (declining) – Providing fawning habitat in an area that is not key to the population would not impact the population trend for pronghorn on the PNF. Maintaining 160 acres of fawning habitat would not change the habitat trend for the species on the Forest.
<b>Grassland w/ shrub</b>	Acceptable ground cover and diversity would continue.	Pronghorn (Antelope) (declining) – No impact to habitat or population trends
<b>Chaparral</b>	No expected change in shrub or grass cover.	Early seral: mule deer (decreasing) - No impact to habitat or population trends Late seral: spotted (rufous-sided) towhee (unknown) - No impact to habitat or population trends
<b>Riparian</b>	Expected increase in herbaceous production, litter accumulation, and woody species recruitment	Late seral: Lucy's warbler (unknown) - No impact to habitat or population trends

*Cumulative Effects*

With no anticipated direct or indirect effects to MIS, their habitat or population trends, there would be no contribution to any cumulative effects.

**Wildlife of Special Concern**

*Belted kingfisher - Direct and Indirect Effects*

The belted kingfisher is known to occur within the allotment. Livestock grazing would occur in the Loball pasture for a grazing period of up to 4 months per year followed by a year of rest. Summer grazing could occur 1 year in 3 or 4. Adaptive management would determine the duration of grazing in the pasture. Proposed livestock grazing in this alternative would maintain or improve riparian vegetative and aquatic

habitats due to limited livestock access in the riparian and providing water away from the riparian for livestock. Therefore this alternative would not have any impacts on kingfishers or their riparian habitats.

#### *Ferruginous hawk - Direct and Indirect Effects*

Ferruginous hawks would be expected to forage in the open grassland habitat within the allotment. The proposed livestock grazing in this alternative may improve prey species habitat for small mammals with the increase of perennial grass species diversity. This would likely only impact a few individuals of the species and would not impact the species on a whole.

### Migratory Birds

#### *Migratory Birds - Direct and Indirect Effects*

The physical habitat features for migratory bird species associated with the forested habitat types, the chaparral, and the pinyon juniper vegetation types, would not be expected to change with the proposed livestock grazing. The physical habitat characteristics for those species associated with the grassland and riparian habitats would be expected to be maintained or improved with the proposed livestock grazing, monitoring and adaptive management.

#### *Agua Fria Important Bird Area - Direct and Indirect Effects*

For the Agua Fria IBA, water diversion or water level changes have been identified as a conservation issue for the IBA. Diverting water from their natural channels could impact the riparian habitat within the IBA. According to the soil and watershed report, in all likelihood, minimal streamflow reduction is projected to occur on the Prescott National Forest In-stream flow reach. The current water use by livestock drinking directly from the stream is approximately the same amount proposed to be pumped to troughs away from the riparian. It is not likely that any of these proposed actions would have any measurable impact to the amount of water coming into the Agua Fria IBA less than 2 miles away (map 8 in Terrestrial Wildlife Specialist Report).

#### *Cumulative Effects*

With no direct or indirect effects to any of these species discussed above under this alternative, this alternative would not contribute to any cumulative effects to these species or their population trends.

## Heritage Resource

### *Affected Environment*

A file search of the heritage resource atlas identified that 40 projects have been completed within the allotment since 1976. These 40 projects include the proposed projects for this EA. Of these 40 projects, 10 surveys do not meet the current survey standards and will not be included in the total acreage. At this time, 626 acres have been intensively surveyed which is about 2.2 percent of the allotment. Since 1973, sixty heritage resource sites have been identified by avocational archaeologists, para-archaeologists, or heritage resource specialists. Unfortunately, fourteen of the sites were not documented on a site form or were not documented in a report thus site information is not available at this time. The 46 sites that have been documented consist of 38 prehistoric sites and 8 historic sites. The prehistoric sites consist of 19 sites with masonry structures/outlines and artifact scatters, nine sites with masonry structures/outlines but no artifacts, two sites with roasting pits and artifacts, one roasting pit but no artifacts, three artifact scatters, two flaked stone scatters, one rock shelter with petroglyphs, and one site of bedrock grinding depressions. The eight historic sites consist of one power line, one substation, three work camps, two

roadbeds, and one historic petroglyph. Forty-four documented sites have been recorded as unevaluated but will be treated as eligible for the National Register of Historic Places until a formal determination can be made. Only two of the documented sites, a historic power line and a prehistoric rock alignment with a scatter, have been previously evaluated as not eligible for the National Register of Historic Places in consultation with the State Historic Preservation Office (SHPO).

## *Environmental Consequences*

### Alternative 1

#### *Direct and Indirect Effects*

There would be no direct or indirect effects on heritage properties as grazing would not be authorized and use of the allotment by domestic livestock would be discontinued after 2 years.

#### *Cumulative Effects*

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

### Alternative 2

#### *Direct and Indirect Effects*

The Prescott National Forest is complying with procedures in Region 3's First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities, Appendix H – Standard Consultation Protocol for Rangeland Management. It has been documented that the Prescott National Forest has been grazed by livestock for over 100 years. Historic properties that might be sensitive to livestock grazing such as ruins with free-standing walls, rock shelters, or historic standing structures have not been identified within the allotment. Heritage surveys of proposed range projects, a road maintenance project, and a watershed project have been completed and only one heritage property was recorded which is not eligible for the National Register of Historic Places.

The proposed actions under this alternative were surveyed and only one heritage resource site was identified and recorded on the forest. In consultation with the SHPO, the site is listed as not eligible for the National Register of Historic Places and avoidance or protection of the site is not required. Reports were completed for all of the proposed projects and they are on file at the PNF Supervisor's Office (PNF Heritage Report No. 2008-49, 2008-51, 2008-52, 2008-53, and 2009-08). In the future, if additional range improvements or other ground disturbing management practices are necessary, the Forest Service will complete the appropriate heritage surveys and/or reports as outlined in our Region 3 Programmatic Agreement Regarding Historic Property Protection and Responsibilities and be in compliance with all applicable provisions of Section 106 of NHPA. Heritage specialists conducted site inspections of nine previously recorded heritage sites and continued grazing at the current level is not expected to significantly impact historic properties.

The Forest Service's proposal to continue livestock management as proposed under this alternative is considered to have a no adverse effect on the heritage properties located within the Sycamore Allotment. The Arizona SHPO has concurred with our findings.

### *Cumulative Effects*

Appendix B provides a list of past, present and reasonably foreseeable future actions and events in the project area that have been considered as part of this cumulative impacts analysis. Authorization of livestock grazing, along with past, present, and reasonably foreseeable future actions, would have minimal cumulative effects on heritage properties.

### *Monitoring*

Heritage specialists will periodically monitor known heritage properties to assess their condition.

## Recreation Resource

### *Affected Environment*

The Sycamore Allotment is open, unless posted closed, to dispersed recreation activities, such as camping, hiking, horseback riding, hunting, mountain biking and target shooting. Motorized travel must be on designated roads and trails only. There are no developed recreation facilities in the project area. The Salt Flat trailhead is located in the allotment and people do camp at this location, but it is not listed as a developed or semi-developed campground. The Sycamore Cabin is a small 2-bedroom cabin located on the Verde Ranger District, which was originally used to house the local Forest Service district ranger and his family, but is now part of the U.S. Forest Service Southwestern Region's "Rooms with a View" cabin rental recreation fee demonstration program. It is maintained and operated by Recreation Solutions, an internal U.S. Forest Service business enterprise. Visitation of the Prescott National Forest in general forest areas, which the project area would be designated as such, has increased by about 20 percent since 2002 (USDA 2008).

Within the boundaries of the Sycamore Allotment there are 3 recreation opportunity spectrum (ROS) categories; semi-primitive motorized (7,043 acres), roaded natural (208,742 acres) and primitive (8,534 acres). Semi-primitive motorized means that a moderate probability for experiencing solitude, closeness to nature and tranquility in a predominately natural appearing environment is likely to occur. Roaded natural means having an opportunity to affiliate with other users in developed sites but with some chance for privacy is likely. Pine Mountain Wilderness, like all wilderness areas, is classified as primitive and is discussed below.

There are ten designated trails in the project area. Nine trails are designated as non-motorized (only hiking, horseback riding, bicycling are allowed) and one trail (T 503) is a multi-use trail (open for quads and motorbikes). Trail condition reports for each of the ten trails were read and the trail conditions were rated to be in good or fair condition.

No comments from recreationists regarding negative interactions with other uses in the project area were received at the Verde, Chino Valley and Bradshaw Ranger Districts. There are no records of complaints and/or negative experiences concerning interactions with livestock from recreationists in the project area. No unacceptable resource impacts to areas where recreationists may frequent (i.e., meadows or riparian areas) have been documented in the course of monitoring by wilderness rangers and recreation managers.

Portions of the Pine Mountain Wilderness Contiguous Inventoried Roadless Area (IRA) are within the Sycamore Allotment. This IRA is adjacent to the northwest part of Pine Mountain Wilderness and was identified as an IRA in 1979.

## *Environmental Consequences*

### Alternative 1

#### *Direct and Indirect Effects*

No direct or indirect impacts are anticipated. Most recreationists would not notice that the area was no longer used to graze livestock.

No livestock would be encountered when hiking trails, and no more signs of grazing (i.e., livestock droppings) would be found in some areas that recreationists frequent.

The recreation opportunity spectrum (ROS) would not change the current classifications if there were no livestock within the Sycamore Allotment.

This alternative would not affect the characteristics of the Pine Mountain Contiguous Inventoried Roadless Area (IRA), and would be in compliance with the Roadless Area Conservation Final Rule (36 CFR Part 294 Special Areas).

#### *Cumulative Effects*

No direct or indirect impacts are anticipated, thus there would be no contribution to any cumulative effects.

### Alternative 2

#### *Direct and Indirect Effects*

No direct and minimal indirect impacts are anticipated. Recreationists may or may not notice livestock when they are using the Sycamore Allotment for recreational activities. Allowing up to 450 cow/calf and 7 horses to continue grazing on the Sycamore Allotment would not have any adverse impacts on recreationists in the area.

Livestock may be encountered when hiking trails and cow droppings may be noticed on trails.

Current recreation opportunity spectrum (ROS) classifications would not change.

Alternative 2 would not affect the characteristics of the Pine Mountain Contiguous Inventoried Roadless Area (IRA) and would be in compliance with the Roadless Area Conservation Final Rule (36 CFR Part 294 Special Areas). Under this final rule, management actions that do not require the construction of new roads will still be allowed, including activities such as grazing of livestock.

#### *Cumulative Effects*

Appendix B includes a list of past, present and reasonably foreseeable future actions and events that were considered in this analysis. Two toilets at Salt Flat trailhead, a popular but infrequently used camp area, were removed by the Forest Service in early 2009 because of infrequent use and vandalism.

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

This alternative is not anticipated to have any contribution to any cumulative effects.

## Wilderness Resource

### *Affected Environment*

The Pine Mountain Wilderness designated by Congress in 1973, straddles the boundary between the Prescott and Tonto National Forests. The Sycamore Allotment includes approximately 7,600 acres of the 20,100 acre wilderness. Lying along the high Verde Rim, the area stands as an island of tall, green timber, surrounded by brush-covered desert mountains with hot, dry mesas and deep canyons. A great variety of wildlife and plants occur in several life zones that culminate on top of Pine Mountain at 6,800 feet elevation. Pine Mountain is one of eight wilderness areas on the Prescott National Forest.

The recreation opportunity spectrum (ROS) has classified Pine Mountain Wilderness as primitive (8,534 acres), meaning that the recreation experience in this location would have a very high probability of experiencing solitude, freedom, closeness to nature, tranquility, self reliance, challenge and risk in a unmodified natural or natural appearing environment. The wilderness is mostly untrammled, natural and does not appear to receive many nonconforming wilderness uses. This area has had cattle grazing on it for a long time and this has not adversely affected a visitor's wilderness experience.

The Prescott National Forest Wilderness Ranger has surveyed/maintained most of the trails in Pine Mountain Wilderness and has noticed livestock grazing along the gentler slopes of Pine Flat in the wilderness. The steeper slopes of the various drainages and upper Pine Mountain are much less utilized by livestock and what use that may occur is dispersed.

### *Environmental Consequences*

#### Alternative 1

##### *Direct and Indirect Effects*

The wilderness experience would be as it is now but without the potential of encountering livestock on trails.

The current recreation opportunity spectrum (ROS) classification of primitive would not change.

##### *Cumulative Effects*

Since no direct or indirect impacts to the wilderness resource are anticipated, there would be no contribution to any cumulative effects.

#### Alternative 2

##### *Direct and Indirect Effects*

No direct or indirect effects to the wilderness resource are anticipated. Allowing up to 450 cow/calf and 7 horses to continue grazing on the Sycamore Allotment year round would not have any adverse impacts on the wilderness resource or on visitors in the Pine Mountain Wilderness. Wilderness conditions would be as they currently are.

The current recreation opportunity spectrum (ROS) classification of primitive would not change.



*Cumulative Effects*

The effects of all past, present and reasonably foreseeable actions and events that have/will take place within Sycamore Allotment (Appendix B) would not change the ROS standards, thus would not affect visitors' wilderness experience. No cumulative effects are anticipated.

## Chapter 4 – Consultation and Coordination

The Forest Service consulted with the following agencies and tribes during the planning process for concurrence on proposal and impacts of implementation:

- Arizona Game & Fish Department, Region VI, Mesa, AZ
- US Fish and Wildlife Service, Ecological Services, Phoenix, AZ
- State Historic Preservation Office, Phoenix, AZ
- Hopi Tribe
- Hualapai Tribe
- Tonto Apache Tribe
- Yavapai-Apache Nation
- Yavapai-Prescott Tribe
- Fort McDowell Indian Community
- Prescott National Forest, Planning

The mailing list for this project included 21 individuals, organizations and agencies interested in the rangeland management of the Sycamore Allotment area. The responses to the proposed action, summary environmental assessment, and summary of those responses and disposition by the planning team are included in project planning record. Comments received from the public during these comment periods were used by the deciding official as important input to the planning process.

### Preparers, Prescott National Forest:

Dee Hines/Linda Jackson	District Ranger
Kelli Spleiss	Rangeland Management Specialist
Ed Holloway	Range NEPA Specialist
Albert Sillas	Fisheries Biologist
Noel Fletcher	Wildlife Biologist
Dorothy Baxter	Recreation Specialist
Elaine Zamora	Archeologist
Scott Spleiss	Fire Management Specialist
Greg Olsen	Hydrologist
Christine Thiel	Writer-Editor, ID Team Lead

### USDA Forest Service, TEAMS Enterprise

Susan A. Howle - Interdisciplinary Team Leader

Kristin Whisennand – Writer/Editor

Dustin Walters – Soils and Watershed Specialist

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## Glossary

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

**Allotment Management Plan (AMP)** - An Allotment Management Plan (AMP) is unique, and is based on the individual landscape and ranch operation and will be modified with modification or issuance of a new permit following a NEPA decision to ensure consistency with the NEPA decision. The AMP must be included in Part 3 of the term grazing permit. The Sycamore Allotment must maintain a current AMP developed within the bounds of the NEPA based decision (USDA 2007).

**Animal Unit Month (AUM)** – The quantity of forage required by one mature cow (1,000 pounds) or the equivalent for 1 month.

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

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

**Best Management Practice (BMP)** – Application of the best available demonstrated control technology, processes, measures and operating methods that are socially, economically and technically feasible for controlling soil loss or improving water quality.

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

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

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

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

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

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

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

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

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

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

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

**Ephemeral** – A stream that flows only in direct response to precipitation, and whose channel is above the water table at all times.

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

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

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

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

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

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

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

**Gully Erosion** – The erosion process whereby water accumulates in narrow channels and, over short periods, removes the soil from this narrow area to depths ranging from 20 miles to as much as 75 to 90 feet.

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

**Head Month**- A month's use and occupancy of rangeland by a single animal or equivalent.

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

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

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

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

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

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

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

**Management Indicator Species** – See "Indicator Species."

**Mesa** – A tableland; a flat-topped mountain or other elevation bounded on at least one side by a steep cliff.

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

**Montmorillonitic Soils**- Heavy clay soils that have a high water and nutrient holding capacity, and resist erosion.



**National Environmental Policy Act (NEPA) –**

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

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

**NEPA-** See “National Environmental Policy Act”

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

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

**Primary Constituent Element-** A physical or biological feature essential to the conservation of a species for which its designated or proposed critical habitat is based on, such as space for individual and population growth, and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and habitats that are protected from disturbance or are representative of the species’ historic geographic and ecological distribution.

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

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

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

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

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

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

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

**Seral Community -** an intermediate stage found in ecological succession in an ecosystem advancing towards its climax community.

**Sinuosity-** A bending or curving shape or movement.

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

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

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

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

**Stream Reach** - the length of the stream selected for monitoring.

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

**Suitable Range** – Range which is accessible to livestock or wildlife and which can be grazed on a sustained yield basis without damage to other resources.

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

**Thermal Cover** – Cover used by animals to reduce effects of weather.

**Threatened Species** – Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

**Travelway** - Any transportation facility that allows vehicle passage of any sort, that came into existence without plans, design or standard construction methods, that is not maintained or signed and has a very low traffic volume.

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

**Trick Tank**- A watering device for livestock or wildlife. It collects precipitation, holds the water in a covered tank to minimize evaporation and maintain adequate water quality, and dispenses water on demand into a basin from which animals can drink.

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

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

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

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

## Appendices

### Appendix A – Best Management Practices

Soil and water conservation measures are a 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.

#### Standard BMPs

- 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/or livestock numbers.
- Periodic field checks to measure forage use to determine if allowable use levels are being reached and inform the permittee of needed pasture movement.
- Periodic field checks to assess vegetation health and trend as well as soil function.
- Application of standard practices such as salting, herding, use of electric fencing, and controlling access to water to achieve proper distribution or lessen the impact on areas which are sensitive or are natural concentration areas.
- Cooperate with permittees to make stock water supplies available for wildlife needs during critical periods.

The following BMPs will be employed. Practice numbers and titles are followed by a brief explanation of site-specific application plans. The number affiliated with each BMP references FSH 2509.22 – (R3) Soil and Water Conservation Practices Handbook, Southwest Region Directive, Chapter 20: Resource Management Activities.

#### 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 stubble height, and adjusting season and duration of use.

#### 22.1 Range Analysis, Allotment Management Plan, Grazing Permit System, and Annual Operating Instructions

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 (AOI) 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 sheets. 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 may occur by controlling access to water, changing season of use, by herding, and by locating salt to encourage use of side slopes or other areas of unused forage. Riparian grazing prescriptions will comply with the Forest Plan and applicable Forest Service Manual/Handbook guidance.

### **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 to ensure vegetation, soil, and water conservation practices are employed to achieve desired conditions (i.e., ensure livestock grazing does not prevent soil condition improvement or adversely affect vegetative cover and diversity).

### **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.

### **25.16 Soil Moisture Limitations**

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

### ***Range Improvement Installations***

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

### **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.

## Appendix B – Past and Present Actions and Events and Reasonably Foreseeable Future Actions

The following table lists the past and present actions and events and reasonably foreseeable future actions on the Verde Ranger District of the Prescott National Forest that have been considered as part of the cumulative impacts analysis. As mentioned previously, not all listed actions and events may be considered in each cumulative effects analysis; each analysis examines only those actions and events that are relevant to the resource in question.

**Table 9. Past, present and reasonably foreseeable future actions or events**

Action or Event	Date	Description
<b>Hiball Prescribed Fire</b>	1994	Approximately 2,250 acres burned on Sycamore Allotment
<b>Willow Springs Prescribed Fire</b>	2001	Approximately 1,333 acres burned on Sycamore Allotment (approximately 1,900 total acres burned)
<b>Pine Mountain Wildland Fire</b>	2001	Approximately 2,994 acres burned on Sycamore Allotment (approximately 7,468 total acres burned)
<b>Cave Creek Complex Wildland Fire</b>	2005	Approximately 3,899 acres burned on Sycamore Allotment (approximately 10,500 total acres burned)
<b>Butte Wildland Fire</b>	2005	Approximately 8,000 acres burned just north of Sycamore Allotment
<b>Willow Fence Range Improvement Project</b>	11/2006	Improve animal distribution through the construction of a cross fence on the Willow Allotment
<b>Forest Plan Amendment – Fire use</b>	8/2007	LMP amendment for wildland fire use
<b>Rice Peak Livestock Grazing Authorization</b>	9/2007	Authorize continued livestock grazing on the Rice Peak Allotment
<b>Willow Livestock Grazing Authorization</b>	9/2007	Authorize continued livestock grazing on the Willow Allotment
<b>Todd Livestock Grazing Authorization</b>	9/2007	Authorize continued livestock grazing on the Willow Allotment
<b>Dugas Livestock Grazing Authorization</b>	9/2007	Authorize continued livestock grazing on the Willow Allotment
<b>V-bar Livestock Grazing Authorization</b>	9/2007	Authorize continued livestock grazing on the Willow Allotment
<b>Aerial Application of Fire Retardant</b>	10/2007	The Forest Service proposes to continue the aerial application of fire retardant to fight fires on NFS lands. An environmental analysis will be conducted to prepare an Environmental Assessment on the proposed action.
<b>APS Sycamore 69kV Powerline Permit Reissuance</b>	On hold	Update and re-authorize Arizona Public Service 69-kV power transmission line across approximately 17 miles of NFS lands
<b>Toilet Removal at Salt Flat Camp Area</b>	2/2009	2 Toilets removed due to non-use and vandalism.
<b>Black Hill Vegetation Management Project (note: this project is west of I-17 south of Forest Road 318A on Verde Ranger District)</b>	6/2009	Develop a plan to manage forest vegetation on approximately 185,000 acres with a primary objective of restoring natural ecological systems and reducing the risk of uncharacteristically intense wildfires.

<b>Action or Event</b>	<b>Date</b>	<b>Description</b>
<b>Designation of Energy Corridors on Federal Land in the 11 Western States (EIS)</b>	7/2009	In accordance with Sec 368 of the Energy Policy Act of 2005, "...The Sec of Agriculture, Commerce, Defense, Energy and Interior, in consultation with FERC, States, tribal or local units of government shall designate energy corridors on federal land. Note: The Forest Service published a Notice of Availability Record of Decision in the Federal Register on March 24, 2009. The document contained an incorrect Internet address, and was reposted April 2, 2009
<b>Dispersed recreation</b>	On-going	Throughout Sycamore Allotment
<b>Firewood gathering</b>	On-going	Throughout Sycamore Allotment
<b>Road and trail maintenance</b>	On-going	Throughout Sycamore Allotment
<b>Future Action</b>	<b>Planned Completion Date</b>	<b>Description</b>
<b>Aqua Fria Antelope habitat Improvement project</b>	9/2009	Wildlife habitat improvement project along antelope migration corridor to reduce pinyon-juniper stocking and improve forage. Project would also improve watershed values.
<b>Forest Plan Revision</b>	9/2012	Revising the Prescott National Forest Land and Resource Management Plan. The Agency published a Final rule at 36 CFR part 219 (April 21, 2008) which replaced the 2005 rule, issued on January 5, 2005 (2005 rule).
<b>Sycamore Ranch APS</b>	9/2009	Arizona Public Services proposes to provide residential electrical service to private lands surrounded by public lands. This includes an application for a road use permit to access private land. There is also an 83 lot single family residential subdivision being planned along Sycamore Creek on private land (unknown date).
<b>Sycamore Livestock Grazing Project</b>	9/2009	Authorize continued livestock grazing on the Sycamore Allotment



