

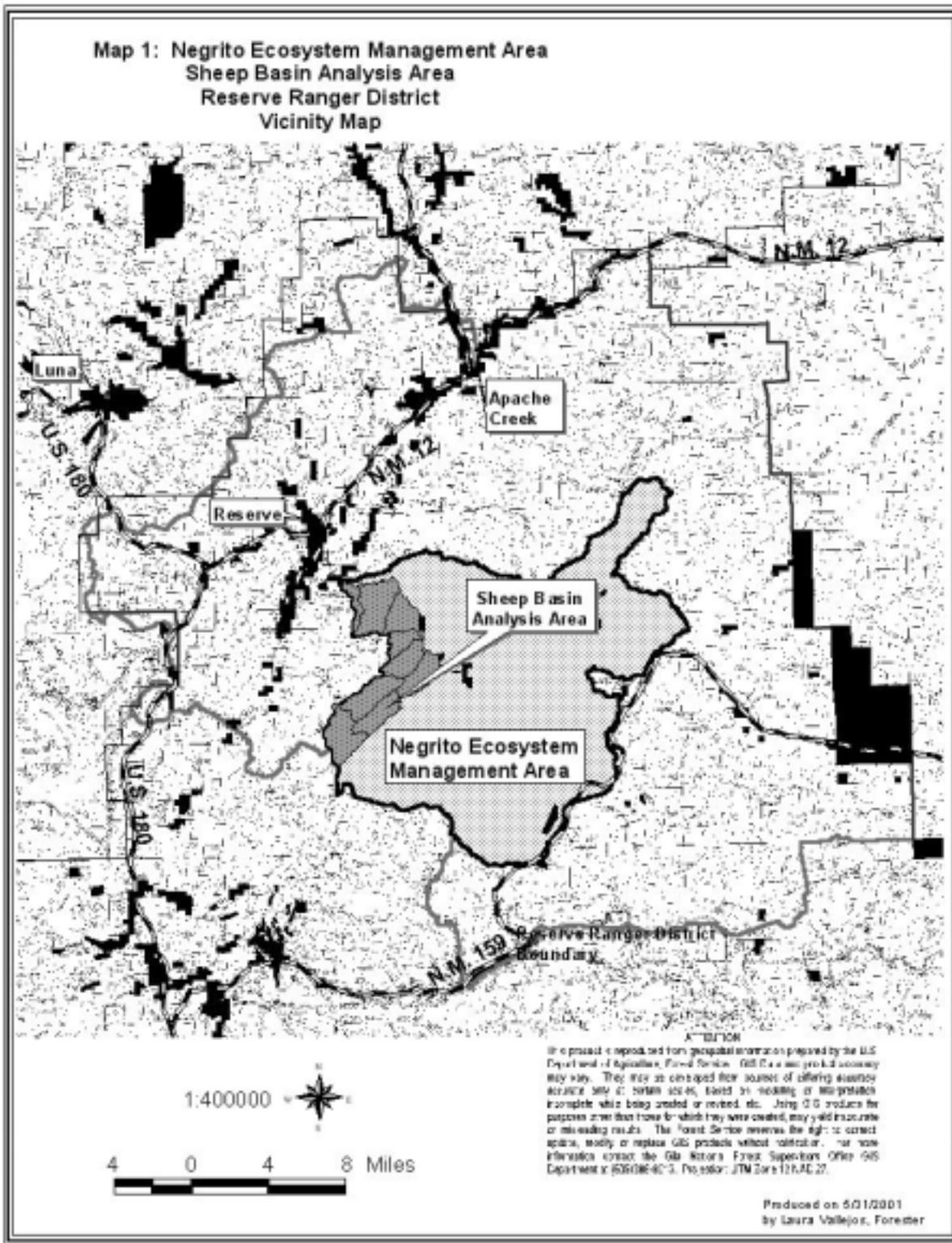


SHEEP BASIN RESTORATION PROJECT

Environmental Assessment



Gila National Forest
Reserve Ranger District
Catron County, New Mexico
November 15, 2002



Civil Rights: Past timber harvest activities and past results of environmental analyses do not indicate evidence of selective effect on any ethnic group, gender, or age group to a greater extent than another. None of the proposed alternatives selectively affect any ethnic group, gender, or age group to a greater extent than another. The alternatives have no impact on civil rights, minority groups or women.

Contents

Overview	5
Proposed Action	6
Purpose and Need for Action	6
Public Involvement.....	7
Alternatives.....	7
Vegetation Effects	11
Fuels Effects	18
Wildlife Effects	23
Watershed, Soils, and Air Effects	52
Range Resources.....	57
Other Effects.....	60
Cumulative Effects.....	63
Literature Cited.....	107
List of Agencies and Persons Consulted	109

Overview

This environmental assessment (EA) has been prepared to provide the Gila National Forest Supervisor sufficient evidence and analysis for determining whether to prepare an environmental impact statement or decision notice and finding of no significant impact as outlined in 40 CFR 1508.9 (a) for the Sheep Basin Restoration Project. The content has been developed in accordance with 40 CFR 1508.9 (a) and tiers directly into the Gila National Forest Land and Resource Management Plan Environmental Impact Statement 1986, to eliminate repetitive discussions of the same issues and to focus on those issues ripe for decision (Forest Service Handbook 1909.15 – 42.1-*Tiering*).

This environmental assessment is being re-released to public. The initial EA was appealed and remanded back to the Reserve Ranger District for revision. An additional alternative has been added based on public comment and changes in management direction regarding some aspects of the project. This is explained in detail in subsequent sections of this document.

The associated project record for the Sheep Basin Restoration Project is referenced throughout this Environmental Assessment and is available for viewing at the Gila National Forest Supervisor's Office, Silver City New Mexico.

The Gila National Forest Supervisor is the responsible official for the Sheep Basin Restoration Project and has discretion to sign a decision notice and finding of no significant impact that could implement all or portions of alternatives disclosed in this environmental assessment.

The decision to be made will focus exclusively on: group selection/single selection harvesting, thinning, burning, herbicide treatment and road decommissioning activities directly associated with the Sheep Basin Restoration Project on National Forest System land. Should an action alternative be selected, the Forest Supervisor would authorize activities by timber sale, service, and/or embedded contract(s).

The activities proposed in this analysis have been developed within the legal framework and stewardship policy that guides resource management in the National Forest System. With the exception of Alternative 5, the proposed project activities were developed within the guidelines of the National Environmental Policy Act, Endangered Species Act, and the National Forest Land and Resource Management Plan 1986, Forest Plan goals, standards, and guidelines for improving site productivity, maintaining and improving Mexican spotted owl and goshawk habitat (1996 Forest Plan Amendment, pg 87-94), providing fuelwood and pulpwood to aid in providing employment opportunities in rural communities, and meeting the Forest Plan timber emphasis of harvesting within Management Area (MA) 6C (Forest Plan pg. 185-192).

Alternative 5 does not comply with Mexican spotted owl, old growth, and goshawk guidelines. Approximately 155 acres of ponderosa pine and 1,042 acres of woodland would be managed as grassland. An additional 210 acres of ponderosa pine-Gambel oak stands would convert to oak woodland in 20 years. Should Alternative 5 be selected, a Forest Plan amendment would be required to address the cover type conversion and departure from Forest Plan guidelines (see Vegetation Effects, page 18 Alternative 5).

Proposed Action

The Forest Supervisor is proposing to: regenerate stands of ponderosa pine using single tree selection harvest methods; thin stands of ponderosa pine, manage woodland stands as grassland; eliminate harvest generated fuels by lopping, scattering, burning and piling; apply herbicide to juniper stumps; broadcast burn ground fuels and; decommission roads in the Sheep Basin Restoration Project Area. A more detailed description of the proposed action can be found in the Alternatives discussion on page 7.

The Sheep Basin Restoration Project Area (project area) is located southeast of the Village of Reserve, New Mexico. It is entirely within the Reserve Ranger District, Catron County New Mexico (Vicinity Map – inside cover). Treatment would occur across 6,143 acres (Alternatives 2, 3, 4 and 6) or 15,379 acres (Alternative 5) of National Forest System land in the central portion of the Reserve Ranger District. The area is predominantly covered by ponderosa pine, pinyon pine, and juniper. Elevations range from 6,800 feet to 7,900 feet. Approximately 211 acres of the Sheep Basin Restoration Project overlap with the Apache Timber Sale Project Area. Maintenance broadcast burning would occur 3-5 years after harvesting within this overlap area.

Purpose and Need for Action

The desired future condition for the Sheep Basin Restoration Project Area was developed using the Forest Plan, the Negrito Ecosystem Analysis Report, and site-specific data. In the future, it is desired that the project area include a variety of tree age classes and stand densities distributed across the landscape (Project Records 57 and 123). The stand structures would provide a sustainable mixture of vegetative structural stages (VSS). Dwarf mistletoe would continue to exist at endemic levels. Ground cover across woodlands would be adequate to hold soil in place. There would be a mosaic of tree canopy openings with minimal ground and ladder fuels present. Where Gambel oaks occur, they would be well distributed among the ponderosa pine with multiple age and size classes represented. The VSS classes would be well distributed within project area. Excess roads would not be contributing to sedimentation.

Class	Description	Diameter at Breast Height	
VSS 1	grass-forb-shrub	0-1	inches
VSS 2	seedling/sapling	1-5	inches
VSS 3	young forest	5-12	inches
VSS 4	mid-age forest	12-18	inches
VSS 5	mature forest	18-24	inches
VSS 6	old forest	24+	inches

Presently, the majority of individual stands within the project area are even-aged with minor differences in individual trees age and size and very little vertical structural diversity. The VSS classes in the area are presently as follows: VSS 1 = >2%; VSS 2 = 8%; VSS 3 = 49%; VSS 4 = 28%; VSS 5 = 11%; and VSS 6 = >4%. Twenty-five ponderosa pine stands are infected with dwarf mistletoe. Live and dead fuel loadings range from 1 to 20 tons/acre. Dense

vegetation creates ladder fuels that extend into the upper canopy. Canopies are interlocked with very few openings. All tree species are declining in vigor with poor age class, size representation, and distribution (Project Records 57 and 123). Herbaceous plants are sparse in some areas under moderate to dense ponderosa pine, pinyon pine and juniper canopies. Some secondary roads, with duplicative routes, are contributing to sedimentation.

There is a need to decrease the risk of damage to people and resources should an intense wildfire rapidly spread across the project area, consuming surface (litter, needles, small branches, etc.) and ground (duff layer) fuels and utilizing fuel ladders to torch tree crowns. Age classes need to be increased approximately 35% in mid-age and mature stands (VSS 4, 5, 6) to provide habitat constituents for goshawk and other wildlife species. Larger size class representation and improved stand structural diversity is needed to promote sustainable forest and wildlife habitat components. Dwarf mistletoe infected trees need to be removed to reduce the risk of further infection and tree loss in the area. Openings are needed in ponderosa pine stands to promote ponderosa pine regeneration. Roads that are duplicated, poorly located, and/or contributing sedimentation need to be decommissioned or closed to prevent further resource damage. Density in pinyon pine and juniper stands needs to be decreased to encourage herbaceous plant growth (ground cover), which would decrease soil erosion.

Public Involvement

The Sheep Basin Restoration Project has been listed in the Gila National Forest Schedule of Proposed Actions. Individuals interested in the Sheep Basin Restoration project have participated in the development of the proposed actions as follows:

June 14, 2000 – The Forest solicited comments from interested parties in a scoping letter (Project Record 2).

June 14, 2000 - The Forest solicited comments from interested parties by publishing a notice in the Silver City Daily Press requesting comments (Project Record 7).

July 21, 2000 – The Forest hosted a field trip to the project area (Project Record 20).

May 25, 2001 - The Forest hosted a field trip to review sample marking (Project Record 51).

May 29, 2002 - The Forest hosted a field trip to review marking (Project Record 115).

August 26, 2002 - The Forest hosted a field trip to review marking (Project Record 115).

Alternatives

The project interdisciplinary team evaluated all comments received on the proposed action (Project Record 24). The following significant issues were brought forward into the alternative development process (Project Record 25).

Issue 1: Applying herbicides to control alligator juniper stump sprouting may cause health risks to people and wildlife.

Issue 2: Removing trees larger than 12” and 16” diameter at breast height (DBH) would reduce declining old growth in ponderosa pine stands.

Issue 3: Harvesting ponderosa pine would reduce the canopy closure to a point that may not provide suitable habitat for wildlife such as some management indicator species.

The following alternatives were developed by the project interdisciplinary team to address one or more of the three significant issues while meeting the purpose and need of the project.

In this revision of the EA, an additional alternative has been added and analyzed based on input from interested parties and addresses issue 2. Retention of yellow pines has been

analyzed as Alternative 6. An additional alternative was generated through public scoping, evaluated, and dropped from detailed analysis. This alternative proposed the use of prescribed and natural fire alone. This was dropped from further analysis, as it did not adequately meet the purpose and need of reducing ladder fuels and promoting structural diversity.

The following alternatives have been carried forward into further analysis. Alternative 1 represents no action as required by 40 CFR § 1502.14 (d). Alternative 2 is designed to promote old growth characteristics across 22% of the ponderosa pine cover type and 28% of the woodland type, promote goshawk habitat, and manage 20% of ponderosa pine-Gambel oak in restricted Mexican spotted owl habitat for target/threshold conditions. Additionally, Alternative 2 is designed for disclosure of effects related to issues 1, 2, and 3. Alternative 3 is similar to Alternative 2 but adjusts the diameter class harvested and excludes herbicide use for disclosure of effects related to issues 1, 2, and 3. Alternative 4 is similar to Alternative 3 with further adjustments to the diameter class harvested. Alternative 4 also provides for additional cover for wildlife by excluding treatment in additional stands. Alternative 5 represents the proposed action. Alternative 6 combines components of Alternative 2 and 4 and leaves all yellow pine.

Alternative 1: No Action: None of the proposed activities would be implemented in the analysis area. On-going administrative activities would continue.

Alternative 2: Group Selection: Uneven-aged management would occur across approximately 3,362 acres of ponderosa pine. Regeneration would be accomplished by utilizing the group selection harvest method. The groups would be limited to 2 acres in goshawk Post Fledgling Family Areas (PFA) and 4 acres in remaining areas. Group selection would be used in stands with little or no dwarf mistletoe infection. Of the 3,362 acres, approximately 10% of the area would be regenerated and the remainder would be thinned (between groups). The majority of trees harvested would be less than 18" DBH. No trees larger than 23.9 " DBH would be harvested in Mexican spotted owl restricted habitat.

Pre-commercial and Commercial Thinning Only: Approximately 183 acres of dense ponderosa pine stands would be commercially (intermediate harvest) and noncommercially thinned. The majority of trees thinned would be less than 18" DBH.

Mexican Spotted Owl Management: Approximately 220 acres (20%) of the ponderosa pine-Gambel oak type would be thinned and 59 acres would be broadcast burned to achieve Mexican spotted owl restricted habitat target/threshold conditions.

Ponderosa Pine Savanna Management: All trees less than 18" DBH would be cut across approximately 155 acres to enhance and restore ponderosa pine savanna characteristics.

Woodland Management: Thinning and broadcast burning would occur across approximately 1,042 acres of pinyon-juniper woodlands reducing stand density 30-60%.

Burning and Activity Fuels Treatment: Approximately 554 acres of ponderosa pine stands and approximately 134 acres of woodland stands would be broadcast burned outside of mechanical treatment areas. Approximately 173 acres would be broadcast burned within harvest units. Activity fuels on approximately 4,998 acres would be lopped,

scattered and broadcast burned and 225 acres would be piled and burned. A total of 5,918 acres would be broadcast burned. Maintenance (follow-up) broadcast burning would occur 3-5 years after the initial burning. Prescribed burning would not occur during periods of high fire danger.

Grassland Restoration: Conifers less than 18" DBH encroaching into approximately 223 acres of existing grassland and meadows would be cut using commercial and non-commercial methods. Meadows and edges of the treated grassland would be broadcast burned.

Road Management: Approximately 8.24 miles of existing roads would be decommissioned. Decommissioning activities would include ripping, reshaping, and seeding the roadbed with certified "weed free" grass. Forest roads proposed for decommissioning are as follows:

4042R	4042S	4042T	4162B	4162C
4162J	4162U	4162V	4163B	4163W
4167A	4167B	4167C	4314N	4317V

Approximately 3.84 miles of closed roads may be reopened for harvest activities including forest development roads:

141C	4162W	141B	4162D
4162X	4163C	4163X	

At the conclusion of harvesting, these roads would be closed once again. Minor road reconditioning may be required to bring the closed roads up to a safe standard for large haul trucks. Road reconditioning activities may include removing vegetation, grading dips, and blading along existing roadbeds. A pipe gate would be installed on FDR 526.

Herbicide Treatment: Following the mechanical treatments in woodlands, the herbicide picloram would be hand applied to alligator juniper stumps across 1,418 acres.

Alternative 3: Activities associated with Alternative 3 are identical to those listed under Alternative 2 with the following exceptions. No trees 12.1" DBH and larger would be harvested. Commercial & noncommercial ponderosa pine thinning would occur across approximately 2,810 acres. Regeneration groups would be created across 12% or 735 acres using uneven age management. No herbicides would be used. Alligator juniper stumps would be removed (grubbed) either by hand or with a small dozer across approximately 1,206 acres.

Alternative 4: Activities associated with Alternative 4 are identical to those listed under Alternative 2 with the following exceptions. No trees 16.1" DBH and larger would be harvested. Commercial & noncommercial ponderosa pine thinning would occur across approximately 343 acres. Of the 2,250 acres of pine harvested, approximately 11% would be regenerated using uneven age management. No harvest would occur in stands designated as developing old growth or wildlife corridors. No herbicides would be used.

Approximately 778 acres of woodlands would be thinned. Approximately 2,205 would be broadcast burned. Activity fuels on approximately 3,684 acres would be lopped, scattered and broadcast burned and 195 acres would be piled and burned.

A total of 5,948 acres would be broadcast burned. Maintenance (follow-up) broadcast burning would occur 5 to 7 years after the initial burning. Prescribed burning would not occur during periods of high fire danger.

Alternative 5: Activities associated with Alternative 5 are similar to those listed under Alternative 2 with the following exceptions. Herbicide application would occur across 1,889 acres. A single tree selection harvest method would be utilized across approximately 1,060 acres of ponderosa pine. Commercial & noncommercial thinning would occur across approximately 3,260 acres of ponderosa pine stands. Approximately 1,430 acres of forest and woodlands would be thinned and broadcast burned to create grasslands. Approximately 15,379 acres would be broadcast burned. Prescribed burning would not occur during periods of high fire danger. Eight pipe gates and twelve trick tanks would be installed.

Alternative 6: Activities associated with Alternative 6 are similar to those listed under Alternatives 2 and 4. Fuel treatment would occur on approximately 6,143 acres. Mechanical treatment would occur on approximately 2,756 acres of ponderosa pine with a 24" DBH cut limit on ponderosa pine in Mexican spotted owl restricted habitat. Retain all yellow pine. Treat by cutting approximately 1,102 acres woodland and grassland. Treat alligator juniper sprouts with prescribed burning. Decommission 8.24 miles of roads and install one gate. No harvest would occur in stands designated as developing old growth or wildlife corridors. No herbicides would be used.

To minimize resource impacts, the following mitigation measures would be followed for Alternatives 2-6.

- To reduce soil erosion and sedimentation, appropriate best management practices (BMPs) would be followed for any ground disturbing activity.
- To enhance wildlife habitat, retention of snags would occur as prescribed by the 1996 Forest Plan amendment.
- To reduce the potential of introducing noxious weed species into the area, certified "noxious weed free" grass seed would be used when revegetating landings, skid trails, and decommissioning roads.
- A buffer prohibiting tree cutting would be established extending away from the ephemeral drainages. The width of the buffer would be evaluated on a site-specific basis based on topography.
- Herbicide would not be applied to water and straw bale sediment retention structures would be placed, when and where appropriate, in ephemeral drainages to offset potential effects to aquatic species (Alternatives 2 and 5).
- Where felling of trees whose roots appear to be growing within archaeological features is prescribed, the tree would be hand cut (directionally fell away from features,

using chainsaws). A site visit would take place by an archaeologist prior to treatment to determine if all sites are marked for avoidance. No piling and burning would occur within heritage resource site boundaries.

- A 30-foot buffer would be maintained around any live waters and dry drainages when treating with herbicides (Alternatives 2 and 5).
- Should Mexican spotted owl activity be discovered, the area would be resurveyed and appropriate protection assigned prior to implementation of activities.

A summary of the Alternatives presented above is displayed in the following tables on page 12-14.

Vegetation Effects

A detailed analysis of old growth (Project Record 29), Mexican spotted owl habitat (Project Record 26), and northern goshawk (Project Record 37) has been completed and has been summarized and incorporated into the following discussion.

Alternative 1: Tree growth would slow as stand density increases. Native cool season grasses, shrubs, and forbs would continue to decline in vigor and growth and no new openings in the canopies would be created for conifer regeneration. Grassland maintenance would not occur and herbaceous forage would decline. The majority of ponderosa pine and woodland sites would be fully occupied affecting individual tree diameter and volume growth.

Over a 100-year period, approximately 764 acres ponderosa pine forest type and 317 acres of woodland would slowly obtain the characteristics of an old growth stand. Approximately 47 acres of ponderosa pine-oak would obtain the characteristics of a Mexican spotted owl restricted habitat threshold stand. Canopy closure would be dense across the project area. One 49-acre ponderosa pine-Gambel oak stand would convert to oak-woodland over a 90-year period. The VSS would slowly transition towards desirable structural habitat components for northern goshawk (Project Record 57). Mistletoe infection would slowly increase.

No new seedlings would become established except where minor openings occur and trees would grow slowly into the 24-inch or greater diameter class (VSS 6). The majority of the area would remain in a young to mid-age structural class (VSS 3 and 4). There would continue to be a deficiency in VSS 1, 2, 5, and 6. Individual small and large trees and total stand growth would decrease, health and vigor would decline due to density related mortality and mistletoe infection. A high intensity wildfire could potentially eliminate the stands.

Alligator juniper component within stands would increase in density until site capacity has been reached and mortality occurs. Sprouting would occur as individual trees become damaged or die.

Alternative 2: In selected stands, decreasing stand densities would release dominant and co-dominant trees allowing them to become more vigorous, resistant to insects and disease, and grow at a faster rate into larger size classes. Growth would be slightly slower in stands designated for Mexican spotted owl restricted habitat because trees larger than 23.9" DBH would not be treated. As openings are created, seedlings would become established.

Table 1. Sheep Basin Restoration Project - Alternative Activity Summary

Initial Treatment Burn Activities	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Broadcast Burn (excluding MSO acres in following listing)	861 acres	861 acres	2,205 acres	15,379 acres	2,411 acres
Broadcast burn pine-oak in Mexican spotted owl restricted habitat for target/threshold conditions.	59 acres burned	59 acres burned	59 acres burned	0 acres	59 acres burned
Pile and burn activity fuels	225 acres	225 acres	195 acres	0 acres	195 acres
Lop/Scatter and broadcast burn activity fuels	4,998 acres	4,998 acres	3,684 acres	0 acres	3,478 acres
TOTAL	6,143 acres	6143 acres	6143 acres	15,379 acres	6143 acres
Ponderosa Pine Harvest	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Cut ponderosa pine and pinyon / junipers to enhance ponderosa pine savanna characteristics	155 acres	155 acres	155 acres	None	155 acres
Harvest ponderosa pine utilizing uneven age management.	3,362 acres	735 acres	2,250 acres	1,060 acres	2,332 acres
Commercial and pre-commercial thin ponderosa pine stands	183 acres	2,810 acres	343 acres	3,260 acres	178 acres
Thin pine-oak in Mexican spotted owl restricted habitat for target/threshold conditions.	220 acres	220 acres	91 acres	0 acres	91 acres
TOTAL	3,920 acres	3,920 acres	2,839 acres	4,320 acres	2,756 acres
Woodland and Grassland Treatment	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Thin pinyon pine/juniper woodland	1,042 acres	1,042 acres	778 acres	0 acres	879 acres
Cut conifers for grassland maintenance.	223 acres	223 acres	223 acres	1,430 acres	223 acres
TOTAL	1,265 acres	1,265 acres	1,001 acres	1,430 acres	1,102 acres

Table 2. Sheep Basin Restoration Project – Summary of Alternative Other Activities

Other Activities	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Hand apply herbicide to alligator juniper stumps.	1,418 acres	0 acres	0 acres	1,889 acres	0 acres
Grubbing to remove alligator juniper stumps	0 acres	1,206 acres	0 acres	0 acres	0 acres
Decommission roads	8.24 miles				
Install pipe gates on roads	1 gate	1 gate	1 gate	8 gates	1 gate
Install trick tanks for water supply	None	None	None	12 tanks	None
Broadcast burn harvest units 3-5 years <u>after</u> harvest treatment	5,918 acres	5,918 acres	5,948 acres	15,379 acres	5,948 acres

Table 3. Sheep Basin Restoration Project – Effects Highlights

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Grass growth	Declining 0%	Increasing 30%	Increasing 31%	Increasing 26%	Increase 51%	Increasing 26%
Canopy closure	Dense	open/mod	open/mod	open/mod	open/mod	open/mod
Acres of ponderosa pine obtaining old growth (size) characteristics within 100 years	764 acres	376 acres	331 acres	764 acres	N/A	764 acres
Acres of woodland obtaining old growth (size) characteristics within 100 years	317 acres	317 acres	317 acres	317 acres	N/A	317 acres
Acres of ponderosa pine-Gambel oak obtaining restricted Mexican spotted owl target/threshold conditions within 100 years	47 acres	129 acres	129 acres	47 acres	N/A	47 acres
Acres of ponderosa pine-Gambel oak converted to oak woodland	49 acres	none	none	49 acres	170 acres	49 acres
Desired VSS % ponderosa pine	% of ponderosa pine acres in VSS 20-yr after treatment					
VSS 1 - 10%	0%	7%	2%	5%	0%	5%
VSS 2 - 10%	6%	3%	2%	3%	1%	3%
VSS 3 - 20%	37%	14%	13%	20%	13%	20%
VSS 4 - 20%	36%	42%	46%	41%	47%	41%
VSS 5 - 20%	14%	24%	27%	22%	28%	22%
VSS 6 - 20%	5%	10%	10%	9%	10%	9%
Approximate density of ponderosa pine across area						
% fairly open	2%	31%	34%	40%	44%	40%
% moderately dense	7%	36%	41%	33%	33%	33%
% dense	70%	21%	23%	16%	22%	16%
% very dense	21%	1%	1%	10%	0.2%	10%
Approximate density of pinyon/juniper/oak woodland across area						
% fairly open	0%	0%	0%	0%	100%	0%
% moderately dense	0%	15%	0%	0%	0%	0%
% dense	6%	45%	21%	60%	0%	60%
% very dense	94%	39%	79%	39%	0%	39%
Alligator juniper sprout control lifespan	N/A	15-20 yrs	3-5 yrs	1 yr	15-20 yrs	1 yr
May effect likely to adversely effect wildlife or fish.	No	no	no	no	Mexican spotted owl (habitat) loach minnow (individual and habitat)	no
Effect on Water / Air / Soil Quality	None	short-term	short-term	short-term	short-term	short-term

Grassland maintenance would occur, increasing herbaceous forage. Native cool season grasses, trees, shrubs, and forbs would improve in vigor and growth across much of the area due to the reduced forest canopy.

Approximately 332 acres would be regenerated to VSS 1. Approximately 613 acres of ponderosa pine and 134 acres of woodland would not be treated.

Presently no stands within the project area simultaneously meet the characteristics for old growth and Mexican spotted owl target/threshold conditions (issues 2 and 3). Over a 100-year period, approximately 376 acres of ponderosa pine forest type and 317 acres of woodland would slowly obtain the characteristics of an old growth stand. In the event that prescribe burning becomes too intense there would be a risk of loss of one old growth characteristic - dead and down woody material. The risk of this occurring is very low. Approximately 129 acres of ponderosa pine-Gambel oak would obtain the characteristics of a Mexican spotted owl restricted habitat threshold stand. Canopy closure would be open to moderate across the project area (issue 3).

The VSS classes would change over a 20-year period creating uneven-aged stand structural characteristics over a larger area due to more acres being treated using a group regeneration method. Deficiencies would remain in VSS 1, 2, 3, and 6. Advancement in structural classes would promote the area towards a desirable habitat for northern goshawk more rapidly than Alternative 1 (Project Record 57).

Mistletoe infection would decrease across 1,221 acres due to the removal of large infested trees leaving stands less susceptible to secondary fungi infections or insect damage. There is a possibility that the seedlings would become infected with mistletoe due to retention of infected trees. The total trees infected with mistletoe would decrease overtime as they are harvested or die.

There would be an increase in the variation in stand densities. Decreased stand density in the smaller size classes would release dominant and co-dominant trees allowing them to become more vigorous and resistant to insects and diseases. The effects in untreated stands are the same as those projected under Alternative 1. The risk of stand loss in the event of a high intensity wildfire or insect epidemic is reduced in the treated stands.

Alligator juniper sprouting would increase slightly across 1,418 acres within treatment areas (woodland and ponderosa pine). Sprouting would decrease approximately 60-80% with herbicide application. Control is expected to last 15-20 years reducing competition to newly established seedlings, increasing herbaceous growth, and increasing grass establishment and diversity. Moderate intensity prescribed burning outside the herbicide application area may stimulate alligator sprouting. Burning on a 5-7 year interval within the herbicide treatment areas would reduce the level of re-sprouting. Some broadleaf native grasses and forbs may be killed within 2-3 feet of the target juniper sprout, but would be replaced with adjacent seed sources. There is a possibility that no seeds would germinate from vegetation adjacent to the treatment locations while herbicide persists in the soil (issue 1).

Alternative 3: As in Alternative 2, reduction in stand density would release dominant and co-dominant trees. Release of these trees would be inadequate in some areas due to the diameter restrictions and the growth effects would be similar to Alternative 1. Approximately 91 acres would be regenerated to VSS 1. There would be a slight increase in the variation of stands densities in the smaller size classes. Obtaining seedling regeneration and selection for removal

groups would be difficult due to the diameter limit. Grass land maintenance would be less effective than Alternatives 2, 4, and 5 because trees greater than 12 inches diameter would be retained competing for moisture and sunlight. Native cool season grasses, trees, shrubs, and forbs would improve in vigor and growth as openings are created.

Presently no stands within the project area simultaneously meet the characteristics for old growth and Mexican spotted owl target/threshold conditions. Over a 100-year period, approximately 331 acres of ponderosa pine forest type and 317 acres of woodland would slowly obtain the characteristics of an old growth stand (issue 2 and 3). Fire effects on old growth are the same as those disclosed under Alternative 2. Approximately 129 acres of ponderosa pine-oak would obtain the characteristics of a Mexican spotted owl restricted habitat threshold stand. Canopy closure would be open to moderate across the project area (issue 3).

The VSS classes would change over a 20-year period creating a slightly more even-aged stand structure over a larger area due to thinning up to 12-inch diameter trees. Deficiencies would remain in VSS 1, 2, 3, and 6. Advancement in structural classes would promote the area towards a desirable habitat for northern goshawk more rapidly than Alternative 1.

Mistletoe infection would slightly decrease across 1,221 acres due to the removal of understory trees 12" diameter or smaller. The effectiveness of this treatment would be lower than that of Alternatives 2 and 4 because mistletoe infected stands are not treated by the group selection method. No regeneration is planned in mistletoe infected stands therefore there is no risk the seedlings would become infected.

The effects in untreated stands are the same as those projected in Alternative 1. Approximately 613 acres of ponderosa pine and 134 acres of woodland would not be treated.

Alligator juniper sprouting would increase across 1,206 acres within treatment areas (ponderosa pine and pinyon). Following treatment, mechanical and manual treatments are anticipated to reduce 60-80% of sprouting. Sprout control is expected to last 3-5 years reducing competition to newly established seedlings, increasing herbaceous growth, and increasing grass establishment and diversity. Moderate intensity prescribed burning may stimulate alligator sprouting. The effects of juniper density in the untreated stands are the same as those disclosed under Alternative 1.

Alternative 4: Effects on ponderosa pine stand density would be similar to Alternative 3 and effects on grassland density same as Alternative 2. Presently no stands within the Sheep Basin Restoration Project area simultaneously meet the characteristics for old growth and Mexican spotted owl target/threshold conditions. Over a 100-year period, approximately 764 acres of ponderosa pine forest type and 317 acres of woodland would slowly obtain the characteristics of an old growth stand. Fire effects on old growth would be the same as those disclosed under Alternative 2 (issues 2 and 3). Approximately 47 acres of ponderosa pine-Gambel oak would obtain the characteristics of a Mexican spotted owl restricted habitat threshold stand. Canopy closure would be open to moderate across the project area (issue 3).

The VSS classes would change over a 20-year period creating an uneven aged stand structure over a large area due to the group selection harvest method. Deficiencies would remain in VSS 1, 2, and 6. Advancement in structural classes promoting northern goshawk habitat is similar to Alternatives 2 and 3.

Mistletoe infection would slightly decrease across 915 acres due to the removal of understory trees 16" diameter or smaller. The risk of seedling infection is similar to Alternative 2.

The effects in untreated stands are the same as those projected in Alternative 1. Approximately 1,694 acres of ponderosa pine and 398 acres of woodland would not be treated.

The impacts of alligator juniper sprouting and density would be similar to Alternative 3 with the exception that treatment would occur across 1,207 acres and control is expected to last less than 1 year.

Alternative 5: There would be a slight increase in the variation in stand densities. The effects on individual small and large trees, stand growth/density, and wildfire are similar to those disclosed under Alternative 2. Tree growth in Mexican spotted owl restricted stands would not be decreased because there is no diameter limit.

In many areas, canopy closure would provide inadequate sunlight for ponderosa pine seedling regeneration using the single tree selection method. Approximately 155 acres of ponderosa pine and 1,042 acres of woodland would be managed as grasslands resulting in a forest cover type conversion. Grass would be more abundant as a greater number of acres would be managed as grasslands.

An additional 210 acres would have a forest cover type conversion from ponderosa pine to oak-woodland (*this includes old growth, Mexican spotted owl restricted habitat being managed for target/threshold conditions, and other areas*) (issue 2).

A total of 170 acres of ponderosa pine-Gambel oak Mexican spotted owl restricted habitat would be converted to oak woodland in 2010.

The VSS classes would change over a 20-year period creating an uneven aged stand structure over a smaller area, when compared to Alternatives 2, 3, and 4, due to high leave densities proposed in conjunction with the single tree selection harvest method. Deficiencies would remain in VSS 1, 2, 3, and 6. In stands that do not convert to a different cover type, advancement in structural classes promoting northern goshawk habitat is similar to Alternatives 2, 3 and 4.

The effects of mistletoe infection would be the same as those disclosed under Alternative 2 with the exception that 1,002 acres would be treated and there would be a higher risk that seedlings would be infected by residual trees.

The effects in untreated stands are the same as those projected in Alternative 1. Approximately 454 acres of ponderosa pine would not be treated.

The effects of alligator juniper sprouting and density would be similar to those disclosed under Alternative 2 only across 1,889 acres with more trees removed and greater spacing within mechanical treatment areas. Due to the intensity of the treatment sprouting would be greater than that predicted under Alternative 2.

Alternative 6: Effects on ponderosa pine stand density would be similar to Alternatives 3 and 4 and effects on grassland density same as Alternative 2. Presently no stands within the Sheep

Basin Restoration Project area simultaneously meet the characteristics for old growth and Mexican spotted owl target/threshold conditions. Over a 100-year period, approximately 764 acres of ponderosa pine forest type and 317 acres of woodland would slowly obtain the characteristics of an old growth stand. Fire effects on old growth would be the same as those disclosed under Alternative 2 (issues 2 and 3). Approximately 47 acres of ponderosa pine-Gambel oak would obtain the characteristics of a Mexican spotted owl restricted habitat threshold stand. Canopy closure would be open to moderate across the project area (issue 3).

The VSS classes would change over a 20-year period creating an uneven aged stand structure over a large area due to the group selection harvest method. Deficiencies would remain in VSS 1, 2, and 6. Advancement in structural classes promoting northern goshawk habitat is similar to Alternatives 2-4.

Mistletoe infection would slightly decrease across 915 acres due to the removal of understory trees 16" diameter or smaller. The risk of seedling infection is similar to Alternatives 2 and 4.

The effects in untreated stands are the same as those projected in Alternative 1. Approximately 1,694 acres of ponderosa pine and 398 acres of woodland would not be treated.

The impacts of alligator juniper sprouting and density would be similar to Alternative 3 with the exception that treatment would occur across 1,102 acres and control is expected to last less than 1 year.

Fuels Effects

The analysis area varies in fuel loadings from 1-20 tons/acre. Fuel loading is a major factor in determining susceptibility to wildfires. All the vegetative components including the duff (decomposed layer) litter layer, dead woody, herbaceous, shrub, tree regeneration, branchwood, and foliage components are used to describe the fuel loading on a site. As a general rule, fuel loads tend to increase with stand age, mostly as a result of accumulated downfall from insect, disease, blowdown, needle cast, and natural thinning.

Fire suppression has eliminated most of the naturally occurring, low intensity fires. As a result, the amount of ground fuels and density of forest stands have increased. This has also changed the fire severity regimes. The concept of fire severity regimes combines the elements of fire frequency and fire intensity. As fires occur more frequently, fire intensity is reduced because there is less fuel to support the fire. In contrast low fire frequency allows fuel to accumulate so, when a fire does occur, there is an increased likelihood that fire intensity would be high.

Recent fires have been high intensity crown fires, killing most vegetation and destroying soils productivity over large areas. Examples are the H. B. fire (3771 acres, Aug 1995) and the B.S. Fire (1883 acres, Oct. 1998). Fire behavior analysis attributes this trend to accumulated high fuel loadings, drought, topography (steep slopes), weather (high winds), and increased stand densities. Though high fire intensities can result in damage to vegetation, wildlife, soils, and other elements of the ecosystem, they have and would continue to occur. With this in mind the biggest concern under current conditions is the intensity of fires that are likely under the dense vegetation conditions that now exist.

Within the past 31 years, there have been a total of 519 wildfires within the Negrito Watershed, 71% of these fires were ¼ acre or less. Fires averaged about 22 per year between 1970-1981, 10 per year between 1982-1993 with 17 per year between 1993-2001.

Road access for fire suppression is good for most areas where fire potential is more critical. There are also several open areas that can be used for helispots. The area is within a 15 minute response time from Negrito Fire Base via helicopter.

Over the past 10 years, approximately 14846 acres of broadcast burning has taken place in Sheep Basin Analysis Area. This included the Frisco Plaza MIF in 1992 (2922 acres) and the Sheep Basin MIF in 1995 (11924 acres).

Fire behavior observed during the Sheep Basin prescribed burn, showed low to moderate fire intensities. Previous timber harvest activities opened up the area, slash was lopped and scattered, and the roads created fuel breaks that were used for burn unit boundaries. Increase in fire intensities occurred on steep slopes, and in dense pockets of ponderosa pine, some torching of trees occurred. The fire burned on the ground through most of the area, with minimal scorching or mortality to existing stands.

Forest Plan and Negrito Watershed Objectives: The Sheep Basin project area is located in Forest Land Management areas 4B, 6C, and 6D. Forest Plan Objectives for the area include utilizing planned and unplanned ignitions (within established prescriptions or conditions based on preattack planning) to accomplish fuels management goals, and to construct fuelbreaks to Regional standards. Objectives for Negrito Ecosystem Analysis Report are to reintroduce fire into the ecosystem, and schedule maintenance burns on a 5-7 year rotation. All components of the ecosystem can benefit from natural and overall fuel reduction. The fuels treatment objectives for the Sheep Basin project are to reduce fuel loadings on most of the analysis area.

Proposed treatments: Broadcast burning would occur approximately 3-5 years after harvesting activities to allow fuels time to cure sufficiently for good consumption. Fires would be ignited on ridgetops to create a backing fire, which would create low-to-moderate fire intensities and protect residual timber stands. Prescribed burning in the ponderosa pine would occur in the spring or fall months. The proposed burn area would consist of 1000-2000 acre burn blocks. No more than 200-500 acres would be ignited per day. Acres broadcast burned would not exceed 5,000 acres annually. Naturally-ignited wildland fires would be used to protect, maintain, and enhance resources, and return fire to a more natural role in the ecosystem. Implementation would be based on the Wildland Prescribed Fire Management Policy Implementation Procedures Reference Guide. The Action Alternatives would increase fuel loadings and increase fire hazards. However, the effects would be short term until fuel treatment for the project is completed.

Alternative 1 - No Action Alternative: There would be no treatments. Under this alternative, no activity slash would be created. Consequently, fire risk and potential would not increase immediately. However, fuel buildup would continue as new trees sprout and grow and old ones die and litter the forest floor. Live and dead fuel loadings and fire enhancing characteristics (of fuels) would increase overtime which would eventually contribute to higher fire risk and potential.

Roads: Road access would aid in fire suppression, but would increase the chance for man-caused fires within the area.

Air Quality: The resource value most affected by air pollution is visibility. The affect or potential for deterioration to visibility is from smoke and dust. This alternative does not allow prescribed burning without exceeding New Mexico Air quality standards prescribed by law. Should a wildfire occur in the project area, state air quality standards would be exceeded until suppression personnel were able to extinguish it. No changes in air quality from forest management actions would occur.

Alternative 2

Commercial and Non-Commercial Thinning and Slash Treatment: Both positive and negative effects would be short-term, 1-5 years after treatment. More open stands of trees would reduce the risk of a crown-replacing wildfire. The negative effects are associated with the slash created from the treatment. As slash cures (red slash) it becomes very volatile fuel that would affect fire behavior and fire intensity if a wildfire were to occur. This period of risk lasts 3-5 years, until the slash decomposes to an extent that it does not generate high levels of heat when it burns or is treated in some manner to reduce these risks. Prescribed burning would reduce the additional risks of a high intensity wildfire associated with precommercial thinning slash. Air quality would be affected since approximately 5,918 acres would be a broadcast burn, and 225 acres pile and burn (See Smoke Emissions Index, Project Record 56).

Pinyon/juniper Woodlands: Fire management opportunities appear to be somewhat limited in many alligator juniper communities due to the prolific sprouting ability of this species. Thinning and lopping would increase surface fuels needed to carry fire in this fuel type. Present conditions would not sustain a ground fire unless extreme conditions exist (high temps, dry fuels, high winds). With this in mind, surrounding stands would be affected if a crown fire burned through pinyon/juniper under extreme fire intensities. Opening these stands would reduce the fire risk to surrounding ponderosa pine and mixed conifer stands.

Wildfire Hazard Reduction Ground Fuels/Live Aerial Fuels: Using prescribed fire following mechanical treatments would further reduce surface and aerial fuels and the risk of high intensity wildfire. This would also open the opportunity to use natural occurring ignitions.

Roads: Past timber sales have developed a number of roads that greatly aid fire suppression in the area. These roads serve as fuelbreaks, and are used as firelines during wildfires and prescribed fires.

Grasslands: Fuel treatments can help control shrubs and other species invading grasslands. Opportunities to use fire as a management tool can be limited, however because the fuel loads are often inadequate to support a fire. Open grasslands serve as fuelbreaks for fire suppression, and as landing areas for firefighting personnel. This expedites fire fighting forces time in getting to fires within the area, openings also serve as safety zones for firefighters if needed during high intensity wildfires.

Alligator-Juniper Stump Sprouting Control: Under this alternative the herbicide Picloram, would be used to treat alligator juniper stumps. The use of herbicides is highly controversial. Sprouting occurs even after aboveground vegetation is consumed or damaged by high intensity fires. Mechanical grubbing (dozer) can be successful if maintained. With open stands and an increase in herbaceous and woody plants, prescribed fire can be used to maintain these stands by reducing sprouting.

Allocated Old Growth: Thinning the understory of old growth would reduce ladder fuels that can threaten these stands during wildfires. Thinning followed by low intensity prescribed burns may result in a loss of up to 10% of large dead and down material within these stands. These losses would not substantially affect the characteristics or make them unsuitable as existing or developing old growth stands. Thinning would reduce the severity from future high intensity fires.

Alternative 3

Commercial and Non-Commercial Thinning and Slash Treatment: Under this alternative, fire potential and the need to treat slash would also increase moderately. As in Alternative 2 fire suppression difficulty and cost would increase slightly until fuel treatment, on the project area is completed. Once again, air quality would be affected since approximately 5918 acres would be broadcast burn, and 225 acres would be pile and burn areas.

Pinyon/Juniper Woodlands: Under this alternative, less slash would be created with a diameter cap of 12 inches. Fuels/ fire management concerns are the same as in Alternative 2.

Wildfire Hazard Reduction Ground/Aerial Fuels: Under this alternative less slash would be created with a diameter cap of 12 inches. This can increase fire hazard if live aerial fuels are not treated. Slash would be well distributed over the project area, which would be the 2nd most economical to treat. Only Alternative 4 is more economical to treat.

Roads: Fire/Fuels management concerns are the same as in Alternative 2.

Grasslands: This alternative has the same affects as all Action Alternatives.

Alligator Juniper Stump Sprouting Control: Under this alternative no herbicides would be used, alligator juniper stumps would be mechanically treated. As in Alternative #2 mechanical treatment can be successful if maintenance is kept up, followed by prescribed fire.

Allocated Old Growth: Same as Alternative 2

Alternative 4

Commercial and Non-Commercial Thinning and Slash Treatment: Under this alternative, fire potential and the need to treat slash would increase moderately. Fire suppression difficulty and cost would increase slightly until fuel treatment on the project is completed. Lopping and prescribed fire would be the dominant fuel treatment, due to the low cost of this type of treatment. Air quality would be affected under this alternative since more 5,948 acres is planned for broadcast burn, and 195 acres for pile and burn.

Pinyon/Juniper Woodlands: Under this alternative less fuels manipulation would occur within these stands. The “mosaic” of pinyon/juniper between ponderosa pine and mixed conifer, along with fuel breaks and roads, helps minimize the probability of a large wildland fire (over 500 acres). If left untreated the canopies would close and pose a higher fire risk in the future.

Wildfire Hazard Reduction Ground/Aerial Fuels: Under this alternative less acres of slash would be created with the effects similar to all action alternatives. This alternative would have an increase in aerial fuels.

Roads: Fuels and fire management concerns are the same as all action alternatives.

Grasslands: Fuels and fire management concerns are the same as all action alternatives.

Allocated Old Growth: See Alternative 2

Alternative 5

Commercial and Non-Commercial Thinning and Slash Treatment: As in Alternative 2, both positive and negative effects would be short-term, 1-5 years after treatment. The negative effects are associated with slash created, this alternative would create the highest volume of slash. Air Quality would be affected due to increase in acreage to 15,379 acres for broadcast burn.

Single Tree Selection: This type of treatment would increase fire potential due to an increase in slash, and would open up the area, which would also increase winds, adding to fires potential. Prescribed burning would burn any regeneration that would sprout after mechanical treatment.

Pinyon/Juniper Woodlands: See effects for Alternative 2.

Wildfire Hazard Reduction Ground Fuels/Live Aerial Fuels: See Alternative 2.

Roads: This alternative would have 35.5 miles of road maintenance, negative effects would be an increase in man-caused fires due to road access into the project. On the positive side the roads serve as fuel breaks and easier access for fire suppression.

Grasslands: See Alternative 2

Alligator Juniper Stump Sprouting Control: Under this alternative no herbicides would be used, alligator juniper stumps would be mechanically treated. Maintenance following treatment is needed to keep sprouting from occurring, this can be done mechanically or with prescribed fire. However sprouting has occurred even after high intensity wildfires.

Allocated Old Growth: See Alternative 2

Alternative 6

Commercial and Non-Commercial Thinning and Slash Treatment: Both positive and negative effects would be short-term, 1-5 years after treatment. More open stands of trees would also reduce the risk of a crown-replacing wildfire. The negative effects are associated with the slash created from the treatment. As slash cures (red slash) becomes very volatile fuel that would affect fire behavior and fire intensity if one occurs. This period of risk 3-5 years lasts until the slash decomposes to an extent that it does not generate high levels of heat when it burns or is treated in some manner to reduce these risks. Prescribed burning would reduce the additional risks of a high intensity wildfire associated with precommercial thinning slash. Air quality would be affected since approximately 5948 acres would be a broadcast burn, and 195 acres piled and burned.

Pinyon/Juniper Woodlands: See Alternative 4

Wildfire Hazard Reduction Ground/Aerial Fuels: See Alternative 4

Roads: Same as All Action Alternatives

Grasslands: See Alternative 4

Alligator Juniper Stump Sprouting Control: Prescribed burning alone would not eliminate juniper sprouting, sprouting occurs even after high intensity wildfires.

Allocated Old Growth: Prescribed burning may result in a loss of up to 10% of large dead and down material within these stands. These losses would not substantially affect the characteristics or make them unsuitable as existing or developing old growth stands. It would help reduce the severity from future high intensity fires.

Wildlife Effects

Overview: All fish and wildlife would be heavily impacted by a large-scale, high intensity wildfire burning through the area destroying habitat, individuals, and prey species. The implementation of Alternatives 2-6 would reduce the risk of a high intensity wildfire burning through the project area and would consequently benefit all fish and wildlife. The effects on wildlife species in the Sheep Basin Restoration Project Area from activities listed in Alternatives 1-6 are projected as follows. Several species and habitats with special State or Federal status may be, or are, present in the Sheep Basin Restoration Project Area (Table 4) (Project Record 116).

Mexican Spotted Owl

Alternatives 2-6: The following discussion highlights effects common to alternatives 2-6. Broadcast burning would occur in the spring and fall. Mortality of larger trees may occur but the loss is anticipated to be low (Project Record 119) and occur mainly in the younger age classes. Silvicultural and burn activities are anticipated to have a negative short-term effect on Mexican spotted owl (MSO) prey due to habitat alteration. Although there may be some loss of larger trees, emphasis would be placed on retaining existing snags and large down logs which provide habitat for MSO prey. Residual activity slash would provide a fuel base over a 3-5 year period. There is a short-term risk to MSO individuals and potential foraging habitat should a high intensity wildfire burn through the activity slash. However, after activity slash is lopped/scattered/piled and/or burned, the wildfire risk would decline substantially minimizing the risk of fire destroying MSO nesting habitat adjacent to the project area. The closure and decommissioning of roads would reduce the amount of vehicular disturbance to any Mexican spotted owls that may be using the area.

Prescribed fire would occur in all alternatives. The project area would be divided into burn blocks of 1000-2000 acres, with an ignition of about 200 acres to per day. Under ideal conditions, a maximum of 500 acres per day may be ignited. A maximum of 5,000 acres per year would be burned.

The fires are planned to be ignited in the spring and fall and burn with low to moderate fire intensities with backing fires ignited where appropriate. Decreasing fire risks in the project area would also decrease fire risks to nearby occupied and potential nesting habitat by minimizing the probability that crown fires could spread and severely degrade or eliminate this habitat.

Table 4. Species considered in analysis of the Sheep Basin Restoration Project: C- Federal Candidate; SC= Species of Concern; S= Forest Service Region 3 Sensitive Species; StE= State of New Mexico Endangered; StT - State of New Mexico Threatened; MIS=Management Indicator Species FT=Federal Threatened; FPT Federal Proposed Threatened

S; ST	American peregrine falcon (<i>Falco peregrinus anatum</i>)	SC	long-eared myotis (<i>Myotis evotis</i>)	SC	Arizona southwestern toad (<i>Bufo microscaphus</i>)
S	flamulated owl (<i>Otus flammeolus</i>)	SC	western small-footed myotis (<i>Myotis ciliolabrum</i>)	S; SC; StE	Gila groundsel (<i>Senecio quaerens</i>)
C	ferruginous hawk (<i>Buteo regalis</i>)	SC	Allen's lappet-browed bat (<i>Idionycteris phyllotis</i>)	SC; MIS	Sonora sucker (<i>Catostomus insignis</i>)
S;SIT	gray vireo (<i>Vireo vicinior</i>)	SC	Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	S; SC; StE	grama grass cactus (<i>Toumeyia papyracantha</i>)
C	loggerhead shrike (<i>Lanius ludovicianus</i>)	SC	longfin dace (<i>Agosia chrysogaster</i>)	S; SC	spotted bat (<i>Euderma maculatum</i>)
SC	occult little brown bat (<i>Myotis lucifigus occultus</i>)	SC	speckled dace (<i>Rhinichthys osculus</i>)	SC	fringed myotis (<i>Myotis thysanodes</i>)
S;SC; SIT	narrow-headed garter snake (<i>Thamnophis rufipunctatus</i>)	SC; MIS	desert sucker (<i>Catostomus clarkii</i>)	SC	long-legged myotis (<i>Myotis volans</i>)
FT	Mexican spotted owl (<i>Strix occidentalis lucida</i>)	FT	Loach minnow (<i>Rhinichthys [Tiaroga] cobitis</i>)	FT	Spikedace (<i>Meda fulgida</i>)
S; SC	Mogollon clover (<i>Trifolium longipes</i> , var. <i>neurophyllum</i>)	FT	Chiricahua leopard frog (<i>Rana chiricahuensis</i>)	S; SC	northern goshawk (<i>Accipiter gentilis</i>)

In restricted/protected habitat where management activities would take place, including prescribed fire, pre- and post-treatment monitoring would be implemented according to Region 3 monitoring protocol.

Alternative 1: No short-term effects on MSO habitat are anticipated. Over time however, MSO habitat may be degraded or eliminated should a catastrophic wildfire occur.

One stand of the six target/threshold stands, 6213-18, would meet all criteria for Mexican spotted owl threshold as outlined in the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 1996 in approximately 70 years if this alternative is implemented. Project foresters used the Plan criteria to identify stands that would have the most potential for achieving the desired target/threshold condition (Project Record 26). Target/threshold stands were identified by foresters as being those stands that have the best structural qualities. In stands 6194-22, 6194-25, and 6213-21, Alternative 1 is less effective than Alternatives 2 and 3 in terms of obtaining characteristics of Mexican spotted owl target/threshold stands. In stands 6194-31 and 6213-19, effects of implementing Alternative 1 would be the same as the other alternatives (Project Record 57 and 59).

Alternative 1 would have no effect on the Mexican spotted owl and its habitat in the short-term.

Alternative 2: Silvicultural activities are proposed in pine/oak restricted target/threshold MSO habitat including: Compartment 6194 stands 22, 25, 31 and; Compartment 6213 stands 18, 19, 21. Approximately 38 acres of young forest would move towards mid-age to mature/very mature forest. This contributes towards target/threshold condition by providing for larger trees.

The removal of trees less than 24"DBH from restricted MSO habitat that isn't being specifically managed toward target/threshold condition would favor the growth of the residual larger ponderosa pines as well as Gambel oak. Pure ponderosa pine stands, and pinyon/juniper woodlands would provide potential foraging/wintering/migration/ dispersal MSO habitat.

Application of an herbicide to alligator juniper stumps following removal of trees that are encroaching on grasslands, and road maintenance activities are not anticipated to have an effect on MSO individuals/nesting habitat or prey base (issue 1).

Alternative 2 may affect the Mexican spotted owl and its restricted, foraging, wintering, migration, and dispersal habitat. As the effects should be insignificant and discountable, they are not likely to be adverse. In the long term, Alternative 2 should have a beneficial effect on Mexican spotted owl habitat as the risk of severe degradation or elimination of habitat due to catastrophic wildfires would decrease and target/threshold restricted habitat may be attained quicker than in the no action alternative.

Alternative 3: The silvicultural activities proposed in Mexican spotted owl pine/oak restricted habitat, being managed for target/threshold condition, and associated effects to MSOs are identical to those described under Alternative 2.

The removal of trees less than 12"DBH from restricted MSO habitat, that isn't being specifically managed toward target/threshold condition, would favor the growth of the residual larger size class ponderosa pines as well as Gambel oak.

Alternative 3 may affect the Mexican spotted owl and its restricted, foraging, wintering, migration, and dispersal habitat. As the effects should be insignificant and discountable, they are not likely to be adverse. In the long term, these alternatives should have a beneficial effect on Mexican spotted owl habitat as the risk of severe degradation or elimination of habitat due to catastrophic wildfires would decrease and target/threshold restricted habitat may be attained quicker than in Alternative 1.

Alternative 4: Silvicultural activities are proposed in pine/oak restricted target/threshold MSO habitat including compartment 6194 - stand 22. Approximately 19 acres of young forest would move towards mid-age to mature/very mature forest. This contributes towards target/threshold conditions but to a lesser degree than those activities proposed under Alternatives 2 and 3. The removal of trees less than 16" DBH from restricted MSO habitat that isn't being specifically managed toward target/threshold condition would favor the growth of the residual larger size class ponderosa pines as well as Gambel oak to a greater degree than Alternative 3 but to a lesser degree than Alternative 2.

Silvicultural activities would create Mexican spotted owl threshold conditions over a 100-year period in one of the six stands in the treatment areas. Stand 6213-18, would meet all criteria for Mexican spotted owl target/threshold conditions as outlined in the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 1996 in approximately 70 years if this

alternative is implemented. In stand 6194-22, Alternative 4 is as equally effective as Alternatives 2 and 3 and more effective than Alternative 1 in terms of obtaining characteristics of Mexican spotted owl target/threshold stands. Vegetative effects on other threshold stands are disclosed in the Vegetation Effects (Project Record 57).

Alternative 4 may affect the Mexican spotted owl and its restricted, foraging, wintering, migration, and dispersal habitat. As the effects should be insignificant and discountable, they are not likely to be adverse. In the long term, this alternative should have a beneficial effect on Mexican spotted owl habitat as the risk of severe degradation or elimination of habitat due to catastrophic wildfires would decrease and target/threshold restricted habitat may be attained quicker than in the no action alternative.

Alternative 5: Silvicultural activities are proposed in approximately 919 acres of Mexican spotted owl pine/oak restricted habitat including habitat that is to be managed toward target/threshold condition in Alternatives 2, 3, and 4. Single tree selection would occur in a total of approximately 251 acres of restricted habitat and 96 acres of stands to be managed target/threshold condition. Approximately 170 acres of pine/oak restricted habitat would be converted to oak woodlands as would 96 acres of stands to be managed toward target/threshold condition in the other action alternatives.

Because of harvesting of trees 24" DBH and greater in Mexican spotted owl restricted habitat, conversion of some restricted and target/threshold managed stands to oak woodlands, and lack of surveys in likely suitable habitat, this alternative is not in compliance with the Mexican spotted owl Recovery Plan or the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 1996. Therefore no further analysis of the effects of silvicultural activities in this alternative was conducted.

Alternative 5 may affect the Mexican spotted owl and its restricted, foraging, wintering, migration, and dispersal habitat. The effects would not be insignificant and discountable – they would likely be adverse. In the long term, this alternative should have a beneficial effect on Mexican spotted owl habitat as the risk of severe degradation or elimination of habitat due to catastrophic wildfires would decrease and target/threshold restricted habitat may be attained quicker than in the no action alternative.

Alternative 6: Silvicultural activities are proposed in pine/oak restricted target/threshold MSO habitat located in Compartment 6194 - stand 22. Approximately 19 acres of young forest would move towards mid-age to mature/very mature forest. This contributes towards target/threshold conditions but to a lesser degree than those activities proposed under Alternatives 2 and 3. In restricted habitat that is not being specifically managed toward target/threshold condition, both commercial thinning (intermediate harvest) and non-commercial thinning of ponderosa pine would occur. The objective of the thinning would be to reduce the risk of catastrophic wildfire. Commercial thinning of ponderosa pines up to 23.9" DBH that do not have yellow bark would target mistletoe-infected trees where mistletoe brooms occur in the lower third of the canopy and create a fire ladder into the upper crown. The growth of the residual larger size class ponderosa pines as well as Gambel oak would be favored to a greater degree than Alternative 3 but to a lesser degree than Alternative 2.

Silvicultural activities would create Mexican spotted owl threshold conditions over a 100-year period in one of the six stands in the treatment areas. Stand 6213-18, would meet all criteria for

Mexican spotted owl target/threshold conditions as outlined in the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 1996 in approximately 70 years if this alternative is implemented. In stand 6194-22, Alternative 6 is as equally effective as Alternatives 2, 3, and 4 and more effective than Alternative 1 in terms of obtaining characteristics of Mexican spotted owl target/threshold stands. Vegetative effects on other threshold stands are disclosed in the Vegetation Effects (Project Record 123)

Alternative 6 may affect the Mexican spotted owl and its restricted, foraging, wintering, migration, and dispersal habitat. As the effects should be insignificant and discountable, they are not likely to be adverse. In the long term, this alternative should have a beneficial effect on Mexican spotted owl habitat as the risk of severe degradation or elimination of habitat due to catastrophic wildfires would decrease and target/threshold restricted habitat may be attained quicker than in the no action alternative.

Loach Minnow

Alternatives 2-6: The following discussion highlights effects common to alternatives 2-6. Loach minnow preferred habitat is described as turbulent, rocky riffles. One of the main threats to the loach minnow is accelerated erosion and subsequent excessive sediment deposition into their habitat that fills the interstitial spaces of cobble and rubble substrates that are essential for successful reproduction. Effects to occupied loach minnow critical habitat therefore focus on how ash, soil, and herbicide residue deposited into Negrito Creek impact habitat structure and water quality (Project Record 121).

Alternative 1: The Sheep Basin Restoration Project Area drains into Negrito Creek that forms the northern project area boundary. Riparian Area Survey and Evaluation System (RASES) transects evaluated and rated the riparian condition of Negrito Creek as unsatisfactory in 1991, 1992, and 1994. The riparian condition of Negrito Creek is now projected to be in an upward trend and towards satisfactory condition (Project Record 121).

Should Alternative 1 be selected, soil would continue to erode and there would be increased sedimentation into Negrito Creek (Project Record 121) potentially filling the interstitial spaces of cobble and rubble substrates in occupied loach minnow critical habitat and negatively impacting water quality.

Alternative 1 would have no effect on the loach minnow and its critical habitat in the short term. However, in the foreseeable future, the risk of degradation of habitat due to catastrophic wildfires would increase.

Alternative 2: Occupied loach minnow critical habitat occurs in Negrito Creek approximately 7.0 miles downstream from the project area boundary. Herbicide application would occur only during the dry season. Otherwise, if a high intensity rainfall occurred just after herbicide application, chemical residue may travel, via roughly 2.0 miles of ephemeral drainages, into Negrito Creek. The chemical residue would then travel an additional 7.0 miles to reach critical occupied loach minnow habitat (issue 1). Additional minor ash and soil deposition may occur into ephemeral drainages. Stream deposition from herbicide residue, ash, and soil may produce a minor short-term effect on the water quality and structural components of critical occupied loach minnow habitat.

Road reconditioning may cause a slight increase in soil erosion. The improved road drainage would offset this effect. Vehicles may cause some short-term compaction of soils and reduction in water infiltration when accessing the area for firewood removal. Road reconditioning, road decommissioning, and firewood activities are not anticipated to produce measurable effects on loach minnow habitat downstream.

Fuels removal in the project area would reduce the risk of a catastrophic wildfire destroying resources and depositing large amounts of ash and soil into Negrito Creek. This is viewed as a positive preventative action for protection of occupied loach minnow critical habitat downstream.

Best Management Practices would be implemented that include herbicide application only during the dry season and straw bale retention structures would be placed at appropriate intervals in ephemeral drainages.

Alternative 3: Effects would be similar to those predicted under Alternative 2 with the exception that herbicide treatment would not occur (issue 1). Subsequently, the risk of herbicide residue washing downstream would be eliminated and a slight increase in activity related soil sedimentation may cause a minor short-term effect on the water quality and structural components of critical occupied loach minnow habitat.

Alternative 4: The effects to critical occupied loach minnow habitat would be similar to those predicted in Alternative 2 with the following exceptions. Activity related soil deposition into Negrito Creek would be reduced diminishing impacts to water quality and structural composition of critical occupied loach minnow habitat. Herbicides would not be used in this alternative (issue 1).

Alternative 5: Alternative 5 would have the highest number of trees harvested and would use an herbicide on stumps to treat alligator juniper sprouting. Any herbicide residues would be transported along at least 2.0 miles of ephemeral drainages before reaching Negrito Creek. It is an additional 7.0 miles to occupied critical habitat (issue 1). Broadcast burning would occur in the portion of the project area not silviculturally treated and as close as the mesas and ridge tops that are located just above occupied critical habitat. The overstory vegetation in this area ranges from open/moderately closed canopy stands of pinyon/juniper seedlings and saplings, to open/moderately closed canopy ponderosa pine pole stands.

Alternative 6: The effects to occupied loach minnow critical habitat would be similar to those predicted in Alternatives 2, 3, and 4 with the following exceptions. Activity related soil deposition into Negrito Creek would be reduced diminishing impacts to water quality and structural composition of critical occupied loach minnow habitat. Herbicides would not be used in this alternative (issue 1).

Summary: Alternatives 2-4, and 6 may affect the loach minnow and its critical habitat in the short term. The effects are predicted to be insignificant and discountable and are not likely to be adverse for either the species or its critical habitat. In the long term, these alternatives should have a beneficial effect on the loach minnow and its critical habitat, as the risk of degradation of habitat due to catastrophic wildfires would decrease.

Alternative 5 may affect the loach minnow and its critical habitat in the short-term. The effects are predicted to be significant and not discountable and are likely to be adverse for the species and its

critical habitat. The primary constituent habitat element of clean water may be temporarily adversely affected.

In the long term, this alternative should have a beneficial effect on the loach minnow and its critical habitat, as the risk of degradation of habitat due to catastrophic wildfires would decrease.

Overall, from a short-term perspective, Alternative 1 would have the lowest impacts to the loach minnow and critical habitat followed by Alternatives 6, 4, 3, 2, and 5 respectively. From a long-term perspective, Alternative 5 would have the most improvement to loach minnow habitat conditions (water quality and structural composition) followed by Alternatives 2, 3, 4, 6, and 1 respectively.

Spikedace

Alternatives 2-6: The following discussion is common to Alternatives 2-6. The spikedace does not now and has not historically occurred in Negrito Creek. The spikedace has been extirpated from the San Francisco River (Project Record 117), however the San Francisco River, from its confluence with Negrito Creek downstream to its confluence with the Gila River (in Arizona), is designated critical spikedace habitat. The critical habitat is approximately 12.0 miles downstream from the project area. Both Negrito Creek (see loach minnow discussion above) and the San Francisco River are rated as being in unsatisfactory condition but progressing in an upward trend towards satisfactory conditions.

Spikedace occupy flowing waters, usually less than a meter deep, and as adults often aggregate in shear zones along gravel-sand bars, quiet eddies on the downstream edge of riffles, and broad, shallow areas above gravel-sand bars (Propst and Bestgen, 1986, Rinne and Kroeger 1988). Smaller, younger fish are found in quiet water along pool margins over soft, fine-grained bottoms.

Effects of project activities on critical spikedace habitat are similar to those found in critical occupied loach minnow habitat (see loach minnow discussion above) only to a lesser degree as the habitat is further removed from the project area along the San Francisco River.

Alternative 1: The effects would be similar to the loach minnow effects-Alternative 1 projected above only to a lesser degree as the critical spikedace habitat is further removed from the project area along the San Francisco River.

Alternative 1 would have no effect on the spikedace and its critical habitat in the short term. However, in the foreseeable future, the risk of degradation of habitat due to catastrophic wildfires would increase.

Alternative 2: The effects would be similar to the loach minnow effects-Alternative 2 projected above only to a lesser degree as the critical spikedace habitat is further removed from the project area along the San Francisco River herbicide residue would have a longer distance to travel (issue 1).

Best Management Practices would be implemented that include herbicide application only during the dry season and straw-bale retention structures would be placed at appropriate intervals in ephemeral drainages.

Alternative 3: The effects would be similar to the loach minnow effects-Alternative 3 projected above, only to a lesser degree, as the critical spikedece habitat is further removed from the project area along the San Francisco River.

Alternative 4: The effects would be similar to the loach minnow effects-Alternative 4 projected above, only to a lesser degree, as the critical spikedece habitat is further removed from the project area along the San Francisco River.

Alternative 5: Alternative 5 would have the highest number of trees harvested and would use an herbicide on stumps to treat alligator juniper sprouting. Any herbicide residues would be transported along at least 2.0 miles of ephemeral drainages before reaching Negrito Creek (issue 1). It is an additional 10.0 miles to unoccupied critical habitat. Broadcast burning is planned in Alternative 5 in the portion of the project area not silviculturally treated and as close as the mesas and ridge tops that are located just above Negrito Creek, approximately 4.0 miles from unoccupied critical habitat.

Best Management Practices would be implemented that include herbicide application only during the dry season and straw-bale retention structures would be placed at appropriate intervals in ephemeral drainages.

Alternative 6: The effects would be similar to the loach minnow effects-Alternative 6 projected above, only to a lesser degree, as the critical spikedece habitat is further removed from the project area along the San Francisco River.

Summary: Alternatives 2-6 may affect the spikedece and its critical habitat in the short term. The effects are predicted to be insignificant and discountable and are not likely to be adverse for either the species or its critical habitat. In the long term, these alternatives should have a beneficial effect on the spikedece and its critical habitat, as the risk of degradation of habitat due to catastrophic wildfires would decrease.

Overall, from a short-term perspective, Alternative 1 would have the lowest impacts to spikedece critical habitat followed by Alternatives 6, 4, 3, 2, and 5 respectively. From a long-term perspective, Alternative 5 would have the most improvement to spikedece critical habitat conditions (water quality and structural composition) followed by Alternatives 2, 3, 4, 6, and 1 respectively.

Chiricahua Leopard Frog

Alternatives 2-6: The following discussion is common to Alternatives 2-6. This most aquatic of New Mexico leopard frogs is found in a variety of habitats including springs and seeps, intermittent rocky creeks, lakes, reservoirs, stock tanks and mainstream river reaches. The Chiricahua leopard frog has been found along the San Francisco River and may occur in Negrito Creek although it has not been documented as occurring there. The upper Tularosa/San Francisco River drainages (which include Negrito Creek) may support the largest remaining metapopulations of *Rana chiricahuensis* in New Mexico (Jennings, 1995).

Population declines are attributed in many cases to habitat loss or predation by introduced predaceous fishes, amphibians, and crayfish. A fungal disease, *chytridiomycosis*, has been linked to Chiricahua leopard declines in Arizona and New Mexico. *Chytridiomycosis* is the likely cause of

extirpation of Chiricahua leopard frogs from some stock tanks in the Negrito 5th code watershed (Jennings, pers. comm., 2002). Deterioration of watersheds, and erosion and/or siltation of stream courses are also threats.

This analysis focuses on the effects of harvest activities on watershed condition, erosion, and subsequent sediment deposition into Chiricahua leopard frog habitat.

One stock tank has been confirmed as occupied in the project area and several stock tanks were confirmed as occupied in an analysis area adjoining the project area (Project Record 117). A natural buffer surrounding the occupied stock tank in the project area would catch the sediment and ash deposition that may be generated from management activities in the surrounding forested stands.

Alternative 1: Alternative 1 would not affect the Chiricahua leopard frog and its habitat in the short-term. However, in the foreseeable future, the risk of degradation of habitat due to catastrophic wildfires would increase.

Alternative 2: The Sheep Basin Restoration Project Area drains into Negrito Creek that forms the northern project area boundary. Riparian Area Survey and Evaluation System (RASES) transects evaluated and rated the riparian condition of Negrito Creek as unsatisfactory in 1991, 1992, and 1994. The riparian condition of Negrito Creek is now projected to be in an upward trend and towards satisfactory condition (Project Record 121).

Herbicide application would occur only during the dry season. Otherwise, if a high intensity rainfall occurred just after herbicide application, chemical residue may travel, via roughly 2.0 miles of ephemeral drainages, into Negrito Creek. Additional minor ash and soil deposition may occur into ephemeral drainages. Stream deposition from herbicide residue, ash, and soil may produce a minor short-term effect on the water quality and structural components of potential, unoccupied Chiricahua leopard frog habitat in Negrito Creek.

Road reconditioning may cause a slight increase in soil erosion. The improved road drainage would offset this effect. Vehicles may cause some short-term compaction of soils and reduction in water infiltration when accessing the area for firewood removal. Road reconditioning, road decommissioning, and firewood activities are not anticipated to produce measurable effects on potential, unoccupied Chiricahua leopard frog habitat downstream.

Fuels removal in the project area would reduce the risk of a catastrophic wildfire destroying resources and depositing large amounts of ash and soil into Negrito Creek. This is viewed as a positive preventative action for protection of potential Chiricahua leopard frog habitat downstream.

Best Management Practices would be implemented that include herbicide application only during the dry season and straw bale retention structures would be placed at appropriate intervals in ephemeral drainages.

Alternative 3: Effects would be similar to those predicted under Alternative 2 with the exception that herbicide treatment would not occur (issue 1). Subsequently, the risk of herbicide residue washing downstream would be eliminated and a slight increase in activity related soil sedimentation may cause a minor short-term effect on the water quality and structural components of potential Chiricahua leopard frog habitat.

Alternative 4: The effects to potential Chiricahua leopard frog habitat would be similar to those predicted in Alternative 2 with the following exceptions. Activity related soil deposition into Negrito Creek would be reduced diminishing impacts to water quality and structural composition of potential Chiricahua leopard frog habitat. Herbicides would not be used in this alternative (issue 1).

Alternative 5: Alternative 5 would have the highest number of trees harvested and would use an herbicide on stumps to treat alligator juniper sprouting. Any herbicide residues would be transported along at least 2.0 miles of ephemeral drainages before reaching Negrito Creek.

Broadcast burning would occur in the portion of the project area not silviculturally treated and as close as the mesas and ridge tops that are located just above occupied critical habitat. The overstory vegetation in this area ranges from open/moderately closed canopy stands of pinyon/juniper seedlings and saplings, to open/moderately closed canopy ponderosa pine pole stands.

Alternative 6: The effects to potential habitat would be similar to those predicted in Alternatives 2-5 with the following exceptions. Activity related soil deposition into Negrito Creek would be reduced diminishing impacts to water quality and structural composition of potential habitat. Herbicides would not be used in this alternative (issue 1).

Summary: Alternatives 2-6 may affect the Chiricahua leopard frog in the short term. The effects are predicted to be insignificant and discountable and are not likely to be adverse. In the long term, these alternatives should have a beneficial effect on the Chiricahua leopard frog and its habitat, as the risk of degradation of habitat due to catastrophic wildfires would decrease.

Overall from a short-term perspective, Alternative 1 would have the lowest impacts to soils and watershed conditions followed by Alternatives 6, 4, 3, 2, and 5 respectively.

From a long-term perspective Alternative 5 would have the most improvement to the soils and watershed conditions followed by Alternatives 2, 3, 4, 6, and 1 respectively.

Northern Goshawk

Alternatives 2-6: Forest plan guidelines for northern goshawk habitat for the Sheep Basin Restoration Project Area include ponderosa pine stands where 60% of the stands should be in a VSS class of 4 or greater. Presently, the project area is marginal northern goshawk nesting habitat, containing a deficiency of large mature ponderosa pines that are not in groups. The small area where goshawks were reported contains marginally appropriate nesting habitat. Prey availability in the project area is probably sufficient to support nesting goshawks although populations of prey species associated with mature and very mature trees are likely low.

Goshawk surveys took place within, and 0.5 miles beyond the project area and although no goshawks were found, surveyors reported that a female goshawk responded to a begging call and a male responded to an alarm call within approximately 150 meters of one another (Project Record 30). As a conservative course of action, 731 acres of ponderosa pine stands surrounding the reported goshawk call location would be managed as a post-fledging family area (PFA) (only for Alternatives 2, 3, 4, and 6). This includes the delineation and management of the requisite

number of nest stands within the PFA. Approximately 245 acres of the 731-acre PFA are also designated as restricted Mexican spotted owl habitat and would be managed toward target/threshold condition. See Mexican spotted owl analysis for fire effects.

The closure and decommissioning of roads would reduce the amount of disturbance to any northern goshawks utilizing the project area. The expansion of grasslands to their historic size may minimally alter habitat and prey base at their peripheries.

Alternatives 2-6 manage in varying degrees toward the desired age classes and structural stages as outlined in the standards and guidelines in the Record of Decision for Amendment of Forest Plans, USDA Forest Service, Southwestern Region, 1996 (ROD) and Management Recommendations for the Northern Goshawk in the Southwestern United States - General Technical Report RM-217.

Alternative 1: Activities proposed under Alternative 1 would not modify northern goshawk habitat in the short term as existing environmental conditions and trends would continue. In the foreseeable future, the risk of degradation or elimination of habitat due to catastrophic wildfires would increase.

Alternative 5: Alternative 5 does not contain the conservative delineation of a PFA and associated nest stands. The ROD and RM-217 are not incorporated, as portions of the project in this alternative have not been surveyed for goshawks.

Summary: Alternatives 2-6 may impact individual northern goshawks and their habitat in the short term but due to the spatial scale involved, the impacts are not likely to result in a trend toward Federal listing or loss of viability even though Alternative 5 would not comply with goshawk guidelines in the ROD and RM-217.

In the long term, these alternatives should have a beneficial effect on northern goshawk habitat as the risk of degradation or elimination of habitat due to catastrophic wildfires would decrease and tree size class diversity, canopy cover, and spatial array of different age stands would promote suitable goshawk habitat.

American Peregrine Falcon

No eyries or suitable nesting habitat exist within the project area. The project area is outside of sensitive areas but within designated peregrine falcon foraging habitat. The condition of foraging habitat is the same as northern goshawk foraging habitat previously described.

Alternative 1 would not impact the American peregrine falcon and its habitat in the short-term. However, in the long-term, the risk of degradation or elimination of habitat due to catastrophic wildfires would increase.

The removal of large trees/future snags and reduction in moderately closed to closed canopy may cause a decline in prey species associated with peregrine falcon foraging habitat (issues 2 and 3). Large trees and snags would remain fairly static under Alternatives 3 and 4, maintaining suitable peregrine falcon foraging habitat. Alternative 5 would remove a large amount of trees over much of the area reducing canopy closure with a subsequent decline in prey species associated with these habitats. Alternatives 2 and 6 would remove some of the large trees and reduce canopy closure

but to a lesser extent than Alternative 5 (issue 3). Alternative 6 would retain all yellow bark ponderosa pines regardless of diameter.

Decommissioning roads would reduce the amount of disturbance to American peregrine falcons utilizing the project area. Expanding grasslands may minimally alter peripheral prey habitat. Effects to vegetative structure and prey base from the application of an herbicide to alligator juniper stumps (Alternative 2 and 5) would be negligible (issue 1). The reintroduction of fire into the ecosystem should be beneficial. There may be a short-term impact on prey during burn activities.

Alternative 5 would alter current and future American peregrine falcon habitat the most followed by Alternatives 2, 6, 4, and 3 respectively.

Alternatives 2-6 may affect the American peregrine falcon and its foraging habitat but due to the spatial scale involved relative to overall foraging habitat, the impacts are not likely to result in a trend toward Federal listing or loss of viability.

Over time, these alternatives should have a beneficial effect on American peregrine falcon habitat, as the risk of degradation or elimination of habitat due to catastrophic wildfires would decrease.

Ferruginous Hawk

The primary habitat of this species is open arid grasslands and it may also use open juniper savannahs. The ferruginous hawk has not been documented as occurring within the project area. The 157-acre Sheep Basin grasslands are the best potential habitat, followed by a 66-acre grassland stand. Because the stands are small they are considered marginal habitat. Adjacent areas with scattered trees and rock outcrops may be used by the ferruginous hawk as it often nests in trees but is also a ground nester when no tree or outcropping is available. It preys primarily on rodents but also feeds on birds, snakes, and various insects.

Alternative 1 would not modify potential ferruginous hawk habitat. Over the last several decades, grasslands have decreased in size due to encroachment by conifers and the encroachment would continue.

Alternatives 2-6 would modify potential ferruginous hawk habitat and alter the numbers and diversity of potential prey species by expanding two separate grasslands (157 acres and 66 acres). It is possible that the ferruginous hawk may currently use some of the trees proposed for cutting. While some prey species benefit from the reduction in tree density, others may be negatively affected but not to the extent that the hawk would be harmed. In the long term, these alternatives would benefit the ferruginous hawk.

The effects of decommissioning roads and herbicide application are the same as those stated under American peregrine falcon (issue 1). See Mexican spotted owl discussion for fire effects.

Alternative 5 would alter current and future ferruginous hawk habitat the most as all conifers encroaching into grasslands would be removed regardless of diameter. Alternatives 2 and 6 would remove conifers up to 18" in diameter, Alternative 3 would remove trees up to 12" in diameter, and Alternative 4 would remove trees up to 16" in diameter. Alternative 6 would not remove any yellow bark ponderosa pines.

Alternatives 2-6 would alter the condition of potential ferruginous hawk habitat and may impact individual ferruginous hawks and their habitat in the short term, however the impacts are not likely to result in a trend toward Federal listing or loss of viability.

Flammulated Owl

The project area is marginal flammulated owl habitat, containing scattered clumps of mature ponderosa pines that are widely spaced. The flammulated owl has not been documented in the project area but is known to occur in the adjacent analysis area. Alternative 1 would not modify flammulated owl habitat in the short term.

Alternatives 5 and 2 harvest some large, older, yellow bark trees that may contain cavities used by nesting owls (issue 2). These trees may also become suitable nesting habitat as cavity excavating species. The large, older trees often contain exfoliated bark that supports some of the lepidopteran prey base. Alternative 6 would not harvest any yellow bark ponderosa pines that often contain loosened and detached bark. Alternatives 3 and 4 do not harvest any large, older trees.

Short-term impacts from least to greatest are Alternatives 4, 3, 6, 2, and 5 respectively. In the long term, these alternatives would have beneficial impacts on the flammulated owl and its habitat.

The effects of decommissioning roads and herbicide application are the same as those stated under American peregrine falcon. See Mexican spotted owl discussion for fire effects. Alternatives 2-6 may impact individual flammulated owls and their habitat in the short term, but the impacts are not likely to result in a trend toward Federal listing or loss of viability.

Gray Vireo

The gray vireo may occur in the pinyon-juniper woodlands within the project area. Alternative 1 would not modify gray vireo habitat in the short term. Over time pinyon and juniper open woodlands would continue to close as tree density increases potentially affecting gray vireo habitat. Alternatives 5 would modify habitat the most due to the high reduction in tree densities followed by Alternatives 2, 3, 6, and 4 respectively. The reduction in tree density and canopy cover would open woodlands and improve gray vireo habitat.

The effects of decommissioning roads and herbicide application are the same as those stated under American peregrine falcon. See Mexican spotted owl discussion for fire effects. Alternatives 2-6 may impact individual gray vireos and their habitat. Due to the small spatial scale involved, the impacts are not likely to result in a trend toward Federal listing or loss of viability.

Loggerhead Shrike

The loggerhead shrike has been occasionally observed in and near the grasslands and open ponderosa pine stands within the Negrito watershed. Open pine stands and the periphery of the 157-acre Sheep Basin grasslands and an additional 66-acre grassland are the best potential habitat in the project area.

Alternative 1 would not modify loggerhead shrike habitat in the short term. The risk of degradation or elimination of ponderosa pine habitat due to catastrophic wildfires would increase. Alternatives 2-6 would potentially alter loggerhead shrike habitat through grassland restoration

and opening the ponderosa pine canopy. The risk of degradation or elimination of ponderosa pine habitat due to catastrophic wildfires would decrease. The effects of decommissioning roads and herbicide application are same as those stated under American peregrine falcon. See Mexican spotted owl discussion for fire effects. Alternative 5 would alter current and future loggerhead shrike habitat the most followed by Alternatives 2, 3, 4, and 6, respectively.

Implementation of Alternatives 2-6 may impact individual loggerhead shrikes and their habitat in the short term, but the impacts are not likely to result in a trend toward Federal listing or loss of viability.

Bats

The spotted bat may be present in and near the project area and was located south of the Negrito watershed project area in 1997-98 (M. Ramsey, pers. comm. 1999). The fringed bat was located in the Negrito watershed during surveys in 1995 but is not likely to be abundant. The long-legged myotis was located in the Negrito watershed during surveys in 1995.

The long-eared myotis was located in the Negrito watershed during surveys in 1994-95. Allen's lappet-browed bats and Townsend's big-eared bats were not located in the Negrito watershed during surveys in 1994-95 but may be present.

Although bats are most often observed foraging over water, many species also forage in forests, as they are capable of traveling long distances between roosting and foraging sites. Documented population declines of bats worldwide are due primarily to disturbance in maternity colonies and hibernacula and loss of habitat. Forest harvest in particular has been shown to have detrimental effects on some bat species (Christy and West 1993). The intensities and types of silvicultural treatments were not discussed in this report. While several of these bat species consume a wide variety of insects, others specialize in the types of insects they consume.

Large snags throughout the project area are limited (generally one snag/acre or less). Efforts would be made to retain as many snags as possible as their removal may eliminate habitat and alter the insect assemblages preyed on by some of these bats. Only hazard snags would be removed. Although tree mortality caused by management-ignited fires is expected to be confined mainly to small diameter trees, some large diameter trees may also be killed that would create future suitable snag habitat. Of the silvicultural activities proposed, removal of large trees, especially those greater than 18" in diameter, pose the greatest threat to individual bats (issue 2). Many of these trees are yellowing and creating habitat as the bark becomes loosened and detached. Additionally, removal of larger trees would continue the deficit in future large snag habitat. As no road building would occur in any alternative, rock and fissure crevices potentially utilized by bats are unlikely to be altered or eliminated.

Alternative 1 would not modify bat habitat. Alternative 2 would remove approximately 800-900 ponderosa pine trees that are 18" and greater in diameter (issue 2) based on a computer model projection. Actual large tree removal would be substantially less. As trees of this size are very limited within the project area, their removal may contribute to an overall small decline of bats in the project area. Alternative 3 and 4 would alter bat habitat but to a less degree in the short term than Alternative 2 as 12" and 16" tree diameter caps respectively would occur. Alternative 5 would remove some of the largest trees available although the approximate numbers that would be harvested is unavailable. Alternative 6 would not harvest any yellow bark ponderosa pines

regardless of diameter. In the long term, the numbers of these large trees would increase faster than in Alternatives 1.

Short-term impacts from least to greatest in the action alternatives are Alternatives 3, 4, 6, 2, and 5 respectively. In Alternatives 2-6 the risk of degradation or elimination of habitat due to catastrophic wildfires would decrease.

The effects of decommissioning roads, herbicide application is same as those stated under American peregrine falcon. See Mexican spotted owl discussion for fire effects. In the long term, these alternatives would have beneficial impacts on these bat species and their habitats. Alternatives 2-6 may impact these bat species and their habitats in the short term, but the impacts are not likely to result in a trend toward Federal listing or loss of viability.

Longfin Dace, Speckled Dace, Desert Sucker, Sonora Sucker

Longfin dace, speckled dace, desert sucker, Sonora sucker all occur in Negrito Creek and 12.0 miles downstream from the project area in the San Francisco River. With the exception of Alternative 5, the closest of these stands in the project area are about 2.0 miles from Negrito Creek.

The longfin dace is capable of surviving environmental extremes as it has a high tolerance for elevated temperatures and lowered oxygen levels. It is reported to survive in intermittent streams that dry to the point of no surface flow during the day where it takes refuge in moist detritus and algal mats. The speckled dace often congregates below riffles and eddies where it feeds on algae, detritus, and smaller aquatic invertebrates. The desert and Sonora suckers tend to live in fast flowing water rather than still pools or at least move to swift areas to feed and spawn as adults. The primary threats are watershed and riparian deterioration that degrade the quality of aquatic habitat.

See spikedace discussion for stream condition of Negrito Creek and the San Francisco River. See Mexican spotted owl discussion for fire effects. The effects are also identical to those found under the loach minnow and spikedace discussion. Alternative 1 would not impact the longfin dace, speckled dace, desert sucker and Sonora sucker and their habitat. Impacts from least to greatest are Alternatives 6, 4, 3, 2, and 5 respectively. In the long term, these alternatives would have beneficial impacts on these fish and their habitats. Alternatives 2-6 may impact individual longfin dace, speckled dace, desert sucker and Sonora sucker and their habitat in the short term but the impacts are not likely to result in a trend toward Federal listing or loss of viability provided that the BMPs (Alternatives 2 and 5) implemented include herbicide application only during the dry season and straw bale retention structures are placed at appropriate intervals in ephemeral drainages.

Narrow Headed Garter Snake and Southwestern Toad

The narrow-headed garter snake has been found along Negrito Creek (C. Painter, pers. comm. 1998). The primary threat to the narrow-headed garter snake is accelerated sediment deposition that alters or diminishes prey habitat. Arizona southwestern toad has been found along Negrito Creek and elsewhere in the Negrito watershed (C. Painter, R. Jennings, D. Miller, pers. comm., 1998). One of the prime threats to the Arizona southwestern toad is hybridation with a sympatric

toad species (*Bufo woodhousii*) increased by modification of habitat, which benefits the latter species and may result in a decline in prey abundance.

See the loach minnow discussion for stream conditions. The effects are similar to those disclosed in the loach minnow discussion. See Mexican spotted owl discussion for fire effects.

Alternatives 2-6 may impact the narrow-headed garter snake and Arizona southwestern toad and their habitats in the short term but the impacts are not likely to result in a trend toward Federal listing or loss of viability provided that the BMPs (Alternatives 2 and 5) implemented include herbicide application only during the dry season and straw bale retention structures are placed at appropriate intervals in ephemeral drainages.

Gila Groundsel, Grama Grass Cactus, and Mogollon Clover

Gila groundsel and grama grass cactus were not located in the Negrito watershed during floristic surveys conducted in 1994. Mogollon clover was located in the Negrito watershed during the same surveys.

Gila groundsel and Mogollon clover potential habitat in the uplands may be directly impacted by silvicultural activities and management ignited fire but the risks are low. Indirect effects to the best habitat along Negrito Creek, such as increased stream sedimentation and scouring of potential habitat due to increased runoff, should also be minimal. Most of the soils in the project area and surrounding terrain are formed from basalt that tends to be fairly stable from an erosion standpoint due to the high amount of cobble and stone sized rock on the surface and in the profile. Potentially occupied grama grass cactus habitat would most likely be affected by grassland restoration and woodland treatments.

Alternative 1 would not impact Gila groundsel, Mogollon clover, and grama grass cactus and their habitats in the short-term. See Mexican spotted owl discussion for fire effects.

Alternatives 2 and 5 would have herbicide applied to alligator juniper stumps. It is possible that Gila groundsel, Mogollon clover, and grama grass cactus plants could occur in close proximity to treated stumps. As the herbicide could be washed into the soil during periods of rainfall and taken up by these plants, mortality of individual plants could occur (issue 1).

Short-term impacts from least to greatest are Alternatives 1, 4, 6, 3, 2, and 5 respectively. The current condition of potentially occupied habitat within the project area would be altered.

Implementation of Alternatives 2-6 may impact individual Gila groundsel, Mogollon clover, and grama grass cactus plants and their habitats in the short term, but the impacts are not likely to result in a trend toward Federal listing or loss of viability.

Management Indicator Species

The Land and Resource Management Plan for the Gila National Forest, adopted in 1986, identified 26 Management Indicator Species (MIS). All 26 MIS were considered in the Sheep Basin Project analysis. Because of indicator habitat (vegetation) types found within the project area, fifteen of the MIS were found to have the potential of being affected by project implementation. They are: Rocky Mountain elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), Mexican spotted owl (*Strix*

occidentalis lucida), Merriam's wild turkey (*Meleagris gallopavo*), common [northern] flicker (*Colaptes auratus*), hairy woodpecker (*Picoides villosus*), long-tailed vole (*Microtus longicaudus*), Mexican [Mogollon] vole (*Microtus mogollonensis*), Abert's squirrel (*Sciurus aberti*), black-tail jackrabbit (*Lepus californicus*), Mearns' [Montezuma] Quail (*Cyrtonyx montezumae mearnsi*), plain [juniper] titmouse (*Baeolophus ridgwayi*), Sonora sucker (*Catostomus insignis*), and desert sucker (*Catostomus clarki*).

Because of lack of indicator habitat in or downstream of the project area, there would be no effect on the following species due to project implementation: antelope (*Antilocapra americana*), Arizona grey squirrel (*Sciurus arizonensis*), red squirrel (*Tamiasciurus hudsonicus*), beaver (*Castor canadensis*), blue grouse (*Dendragapus obscurus*), killdeer (*Charadrius vociferous*), black hawk (*Buteogallus anthracinus*), mallard (*Anas platyrhynchos*), yellow warbler (*Dendroica petechia*), hooded oriole (*Icturus cucullatus*), and Gila trout (*Onchorhynchus gilae*).

The reason these species were selected as MIS species is described in the Environmental Impact Statement, Gila National Forest Plan, 1986. The objective was to select species that would indicate successional stages of each vegetation type and serve as an indicator for detecting major habitat changes (Forest Plan EIS page 71). The vegetation types and seral stage information pertinent to the fifteen management indicator species are described as follows:

Rocky Mountain elk – moderate seral stage indicator of grassland, woodland, ponderosa pine, and mixed conifer.

Mule deer – moderate seral stage indicator of piñon-juniper woodland, oak woodland; and moderate to high seral stage indicator of desert shrub, shrub woodland.

Mexican spotted owl – high seral stage indicator of mixed conifer and high elevation riparian.

Merriam's wild turkey – moderate seral stage indicator of woodland, mixed conifer and mid to high elevation riparian; moderate to high seral stage indicator of ponderosa pine.

Common [northern] flicker – high seral stage indicator of piñon-juniper woodland and oak woodland.

Hairy woodpecker – high seral stage indicator of ponderosa pine and mixed conifer.

Long-tailed vole – Low seral stage indicator of ponderosa pine and mixed conifer.

Mexican [Mogollon] vole – Low seral stage indicator of high elevation riparian; primary high seral stage indicator of wet meadow.

Abert's squirrel – moderate to high seral stage indicator of ponderosa pine.

Black-tail jackrabbit - low seral stage indicator of desert shrub, plains grassland, and piñon-juniper woodland and oak woodland.

Mearns' (Montezuma) Quail – moderate to high seral stage indicator of piñon-juniper woodland, and high seral stage indicator of plains grassland, mountain grassland, and oak woodland.

Horned lark – low seral stage indicator of plains grassland, mountain grassland.

Plain (Juniper) titmouse - high seral stage indicator of piñon-juniper woodland, moderate seral stage indicator of shrub woodland.

Sonora and Desert suckers - low seral stage indicators of low/mid/high elevation riparian.

Within the Gila National Forest there are 277,436 acres of mixed conifer; 1,119,773 acres of ponderosa pine; 1,591,082 acres of woodland, 120,334 acres of mountain grassland; 163,787 acres of plains grassland; 43,454 acres of desert shrub; 26,741 acres of riparian (EIS, Gila National Forest Plan, 1986). To ensure population viability of all species, it is important to maintain diverse vegetation types across the landscape.

In order to evaluate changes in seral conditions associated with management indicator species, information from the 1992 Timber Stand Analysis and data from the 1986 Forest Plan analysis were reviewed.

Changes in seral conditions occur due to a number of factors including natural succession, wildland fire, disease, insect, and human influences. In general, natural succession is a slow process and takes many years for vegetation types to change seral conditions. The exceptions are changes that result from wildland fire, disease, insects, and human related activities. In order to evaluate habitat changes associated with management indicator species, a review of all activities having the potential to change vegetation conditions and associated seral stages was conducted.

Population trend is most appropriately addressed at scales above the project level. Many of the selected management indicator species occur and range far beyond the local project scale. Individuals, family groups, or herds such as elk annually use areas much larger than the Sheep Basin Project area and population trend must be examined on a much larger scale to be meaningful. For National Forest Management Act implementation, this is at the Forest scale.

At a site-specific project level, there is a great deal of fluctuation in wide ranging populations. For most species, it would be technically and practically inappropriate to conduct population trend sampling at the scale of individual projects (R Holthausen, USFS National Wildlife Ecologist, pers. comm., 2001; Elzinga et al. 2001). For these reasons, it is inappropriate to determine population trend at the local level.

Rocky Mountain Elk

Analysis indicates the acreage of mountain grassland has increased from low to moderate seral condition by 3% since the Forest Plan was developed. The acreage of moderate seral condition woodland has not changed. The acreage of moderate seral condition ponderosa pine and mixed conifer has increased 1-2%. This change has been beneficial for elk.

With increasing national and state trends, and estimates of stable to increasing numbers on the Forest, long-term population trends for the Gila National Forest appear to be stable. However, since the State Game Commission has continued to increase permits across the Forest, elk numbers are expected to decrease within the foreseeable future.

Elk occur in the Sheep Basin Project area where much of the acreage is moderate seral stage

ponderosa pine and pinyon/juniper woodland with some moderate seral stage grassland. Mixed conifer does not occur in alternatives 2, 3, 4, and 6.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of degradation or elimination of Rocky Mountain elk habitat due to catastrophic wildfire would increase.

Alternatives 2-6 would not change substantial acreage of existing seral stages. Direct effects would include human disturbance during project implementation and an immediate reduction in thermal and hiding cover. Indirect effects include an eventual, relatively short-term increase in foraging habitat, and reduced risk of degradation or elimination of habitat due to catastrophic wildfires. Project implementation would not have a detectable effect on the population trends of elk in the Gila National Forest.

Mule Deer

Analysis indicates the acreage of moderate to high seral condition for desert shrub and woodland has not changed since the Forest Plan was developed. With decreasing national and state trends, and fluctuating numbers on the Forest, long-term population trends for the Gila National Forest appear to be decreasing. Current decreasing deer numbers on the Gila may be correlated with the ongoing, prolonged drought, and inferior deer habitat.

Mule deer occur in the Sheep Basin Project area where much of the acreage is moderate seral stage ponderosa pine and pinyon/juniper woodland with some moderate seral stage grassland. Mule deer are a moderate to high seral stage indicator of desert shrub and woodland.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of degradation or elimination of mule deer habitat due to catastrophic wildfire would increase.

Alternatives 2-6 would not change substantial acreage of existing pinyon-juniper woodland. Direct effects would include human disturbance during project implementation and an immediate reduction in thermal and hiding cover. Indirect effects would include an eventual, relatively short-term increase in browsing and foraging habitat and reduced risk of degradation or elimination of habitat due to catastrophic wildfires. Overall mule deer habitat should improve with project implementation and the project would not have a detectable effect on the population trends of mule deer in the Gila National Forest.

Mexican Spotted Owl (See also previous Mexican spotted owl analysis)

Across the Gila National Forest, the acreage of high seral condition mixed-conifer has decreased 2%, while the acreage of high seral condition riparian has not changed since the Forest Plan was developed. This change has occurred in small pockets, in a mosaic pattern, scattered across the landscape. This change has been beneficial to the owl, as compared to catastrophic fire, which would have resulted in large areas of stand-replacement fire.

Suitable nesting habitat, high seral stage mixed conifer and high elevation riparian habitats do not occur within the Sheep Basin Project area although pine/oak restricted and protected habitat is present. Mexican spotted owls were documented as presumably foraging in the project area (Geo-

Marine Inc., 2001) and PACs have been delineated east of the project area based on positive surveys.

As part of the documentation prepared for consultation on this project under section 7(a)(2) of the Endangered Species Act, a biological determination that project implementation may affect, but is not likely to adversely affect the Mexican spotted owl was made for all action alternatives except Alternative 5. During section 7 consultations on Alternative 4 and combined Alternatives 2/4, the U. S. Fish and Wildlife Service concurred with the not likely to adversely affect determinations. Alternative 6 is identical to the previous Alternative 2/4 except that no yellow bark trees would be removed regardless of diameter.

Project implementation would not have a detectable effect on the population trends of the Mexican spotted owl in the Gila National Forest.

Merriam's Wild Turkey

Across the Gila National Forest, the acreage of moderate seral condition mixed conifer has increased 1% since the Forest Plan was developed. The acreage of moderate seral condition ponderosa pine has increased 2%, and the acreage of high seral condition ponderosa pine has decreased 2%. Overall, these changes have been beneficial to the turkey.

In New Mexico, wild turkey populations have experienced recent declines due to drought conditions. The NMDGF (2000) predicts population numbers would increase over the next five years as wild turkeys occupy currently unoccupied habitats and via transplants.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of degradation or elimination of Merriam's wild turkey habitat due to catastrophic wildfire would increase.

Alternatives 2-6 would increase the acreage of moderate to high seral stage ponderosa pine habitat. Direct effects would include human disturbance during project implementation, potential reduction in quality of nesting habitat in some stands, created openings in the forest canopy, and the probability that some roost trees would be removed. Indirect effects would be an eventual, relatively short-term increase in herbaceous biomass that would improve habitat quality for both poults and adults. Project implementation would not have a detectable effect on population trends of Merriam's wild turkey in the Gila National Forest.

Common (Northern) Flicker

Across the Gila National Forest, the acreage of high seral condition woodland has not changed significantly since the Forest Plan was developed.

With secure global, national, and state rankings, and a slight increase in state population trends, long-term population trends for the Gila National Forest appear to be stable. Large snags are an important habitat component for the northern flicker. With over 2,988,000 acres of ponderosa pine, mixed conifer, and woodland type vegetation on the Gila National Forest, snag habitat is abundant for this species.

In the Sheep Basin Project area, emphasis is placed on the retention of existing snags and most large trees that would provide future snags. High seral condition woodlands would be increased somewhat as no pinyon or juniper 18.0" in diameter or larger would be removed except in Alternative 5.

Pine/oak stands within the project area would be managed for the Mexican spotted owl with the intent of retaining most large diameter ponderosa pines which would also benefit the northern flicker.

Alternative 1 (no action) would continue existing environmental conditions and trends. Potential northern flicker habitat would continue to decline as the densities and canopy cover in pinyon-juniper woodlands continued to increase and high seral stages decrease. The risk of degradation or elimination of habitat due to catastrophic wildfire would increase.

Alternatives 2-6 would somewhat increase the acreage of high seral stage pinyon-juniper woodland habitat. Direct effects would include human disturbance during project implementation, and potential immediate reduction in quality of nesting habitat in some stands. Indirect effects would include an eventual, relatively short-term increase in herbaceous biomass that would improve overall habitat quality and reduced risk of degradation or elimination of habitat due to catastrophic wildfires. Project implementation would not have a detectable effect on population trends of northern flickers in the Gila National Forest.

Hairy Woodpecker

Across the Gila National Forest, the acreage of high seral condition ponderosa pine has decreased 2%, and the acreage of high condition mixed-conifer has also decreased 2% since the Forest Plan was developed. These changes have occurred primarily due to natural fires, and have been beneficial to the hairy woodpecker because of increased snag habitat.

With secure global, national, and state rankings, slightly decreasing regional trends, slightly increasing state trends, and moderately decreasing trends on individual BBS routes, long-term population trends for the hairy woodpeckers appear to be stable to slightly decreasing at the Forest level. Limiting factors for the hairy woodpecker include predation and habitat modification. Snags (25cm or more DBH) and an average of five snags/hectare are assumed optimal for hairy woodpecker reproduction, but may not be adequate for foraging (Sousa, 1987).

With over 2,988,000 acres of ponderosa pine, mixed conifer, and woodland type vegetation on the Gila National Forest, snag habitat is abundant for this species.

In the Sheep Basin Project area, emphasis is placed on the retention of existing snags and most large trees that would provide future snags.

Alternative 1 (no action) would continue existing environmental conditions and trends. Catastrophic fire in the watershed would result in more snag habitat that would be beneficial to the hairy woodpecker.

Alternatives 2- 6 would somewhat increase the acreage of mature and overmature ponderosa pines preferred by this species. Pine/oak stands within the project area would be managed for the Mexican spotted owl with the intent of retaining most large diameter ponderosa pines which would

also benefit the hairy woodpecker. Direct effects would include human disturbance during project implementation, and removal of some trees that are potential habitat. Indirect effects would include an eventual, relatively substantial increase in the acreage of high seral stage ponderosa pine. The reduced risk of catastrophic wildfires would lower the probability of a large-scale increase in snag habitat. Project implementation would not have a detectable effect on population trends of hairy woodpeckers in the Gila National Forest.

Long-tailed Vole

Across the Gila National Forest, the acreage of low seral condition ponderosa pine has not changed, and the acreage of low seral condition mixed conifer has increased 1% since the Forest Plan was developed. This change has been beneficial to the long-tailed vole.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of catastrophic wildfire would increase. Catastrophic fire in the watershed would result in more low seral stage ponderosa pine and mixed conifer habitat that may be beneficial to the long-tailed vole.

Alternatives 2-6 direct effects would include human disturbance during project implementation and an immediate marginal increase in the acreage of low seral stage ponderosa pine habitat. Indirect effects would include a reduction in the risk of catastrophic wildfire and decreased possibility of increased acreage of low seral stage ponderosa pine habitat. Project implementation would not have a detectable effect on population trends of long-tailed voles in the Gila National Forest.

Mexican [Mogollon] Vole

Across the Gila National Forest, the acreage of low seral condition riparian has decreased 26% by moving to moderate seral condition, and the acreage of high seral condition riparian has remained stable. The improvement of riparian condition has been beneficial to the Mexican vole.

Riparian vegetation seral stages do not occur in the Sheep Basin Project area and downstream riparian condition would not be altered to a measurable degree. Mexican voles also inhabit grassy open places in ponderosa pine forests including openings created in the forest canopy.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of degradation or elimination of habitat due to catastrophic wildfire would increase. If a large-scale catastrophic wildfire were to occur, the effects would be to a degree that there would be a detectable effect on the population trends of Mexican voles in the Gila National Forest.

Alternatives 2-6 direct effects would include human disturbance during project implementation. Indirect effects would include the reduced possibility of riparian habitat degradation that corresponds with the reduced risk of catastrophic wildfire. The resultant increase in herbaceous biomass would improve potential habitat quality. Project implementation would not have a detectable effect on population trends of Mexican voles in the Gila National Forest.

Abert's Squirrel

Across the Gila National Forest, the acreage of moderate seral condition ponderosa pine has increased 2%, although the high seral condition ponderosa pine has decreased 2%. Therefore there has been no net change in habitat for Abert's squirrels. With secure global and national rankings, and an apparently secure rank at the state level (sufficiently abundant to withstand hunting), the long-term population trend for Abert's squirrel on the Gila National Forest appears to be stable.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of degradation or elimination of Abert's squirrel habitat due to catastrophic wildfire would increase.

Alternatives 2-6 direct effects would include human disturbance during project implementation, and the removal of some potential nest trees. The removal of some potential nest trees may, in the short term, cause a reduction of the Abert's squirrel population in the project area. The predicted short-term reduction would occur on less than 0.3% of available ponderosa pine habitat on the Forest.

The indirect effects would include an increased combined acreage of up to approximately 25% of moderate and high seral stage ponderosa pine habitat and reduction in the risk of degradation or elimination of habitat due to catastrophic wildfire. Project implementation would not have a detectable effect on the population trend of Abert's squirrels in the Gila National Forest.

Black-tailed Jackrabbit

Across the Gila National Forest, the acreage of low seral condition woodland has remained stable, low seral condition plains grassland has decreased 1%, low seral condition mountain grassland has decreased 3%, and low seral condition desert shrub has remained stable. With secure global, national and state rankings, the long-term population trend for the black-tailed jackrabbit on the Gila National Forest appears to be stable. At the Forest scale, jackrabbits are a fairly common species (USDA Forest Service 1995).

Black-tailed jackrabbits have not been documented in the Sheep Basin Project. Occurrence has been documented in the Negrito Creek 5th code watershed where they were commonly observed in Collins Park grasslands and reported in a transition area of open meadow to ponderosa pine forest (Frey, 1995) approximately 2.0 miles from the project area. Personal observations of black-tailed jackrabbits on the Reserve Ranger District on an annual basis since 1989 indicate that cyclical fluctuations in population numbers occur but the overall population trend appears to be stable.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of degradation or elimination of potential habitat due to catastrophic wildfire would increase.

Alternatives 2-6 direct effects would include human disturbance during project implementation, an immediate reduction in the acreage of low seral stage pinyon-juniper habitat, and immediate increase in the acreage of available grasslands. Mountain grassland restoration would occur on approximately 223 acres where encroachment conifers less than 18.0" DBH would be removed. Meadows, treated grasslands, and oak woodlands would be broadcast burned. Thinning and broadcast burning would occur across 778 to 1,042 acres of pinyon/juniper woodlands where

stand densities would be reduced 30-60%. Indirect effects include the reduction in the risk of degradation or elimination of habitat due to catastrophic wildfire. These management activities would improve the quality of existing potential habitat. Project implementation would not have a detectable effect on the population trend of black-tailed jackrabbits in the Gila National Forest.

Mearns' (Montezuma) Quail

Mearns' quail are uncommon, breeding residents of the Gila National Forest (Zimmerman 1995). Censusing for Mearns' quail has not occurred on the Forest, however, over the past five years the species has been observed in various locations where they were previously unknown. More numerous and larger coveys of Mearns' quail have been seen on both the Wilderness and Silver City Ranger Districts (Jerry Monzingo, Wilderness District Wildlife Biologist, pers. comm.; Russell Ward, Range and Wildlife Assistant Staff, Gila National Forest, pers. comm.).

Across the Gila National Forest, acreage of moderate and high seral condition woodland has remained stable, and acreage of high seral condition grassland has also remained stable. Therefore, habitat has remained stable for the Mearns' quail. With apparently secure global, and national rankings, vulnerable state rankings, an overall fluctuating trend in New Mexico, and increased observations and larger coveys of Mearns' quail on at least two Ranger Districts, the trend for the species on the Forest is thought to be stable. The status of Mearns' quail cannot be accurately assessed using the current BBS and CBS data (Great Backyard Bird Count 2002).

As with other quail, Mearns' populations are often impacted by uncontrollable factors (i.e., weather). Quail populations are often dependent on nesting success. Spring and summer moisture has a strong influence on hatches and chick survival (Dixon and Knight 1993).

Mearns' quail have not been documented in the Sheep Basin Project area where high seral stage mountain grassland and low seral stage oak woodland are limited. Personal observations of Mearns' quail on the Reserve Ranger District at various times since 1989, indicate population levels are low but appear to be stable.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of degradation or elimination of potential habitat due to catastrophic wildfire would increase.

Alternatives 2-6 direct effects include human disturbance during project implementation. There would be an immediate marginal increase in the acreage of mountain grassland. Grassland restoration would occur on approximately 223 acres where encroachment conifers less than 18.0" DBH would be removed. Meadows, treated grasslands, and oak woodlands would be broadcast burned. The acreage of moderate and high seral stage pinyon/juniper woodlands should increase somewhat and the overstory canopy coverage would be more open. In the short term, habitat quality would decrease as the limited amount of high seral stage grassland would be subjected to broadcast burns but in the long term, the acreage of this seral stage should increase. Additionally, in the long term, the amount of Gambel oak acorns produced should increase as the Gambel oak competition with ponderosa pine is reduced by thinning of the pine. Overall long-term habitat quality should improve. Indirect effects would include the reduction in the risk of degradation or elimination of habitat due to catastrophic wildfire. Project implementation would not have a detectable effect on the population trend of Mearns' quail in the Gila National Forest.

Horned Lark

Four BBS routes are located on or near the Gila National Forest. Two routes, one near Horse Springs and the other near Quemado, have detected horned larks. They were present in all years surveyed at both routes, and neither data set indicates a declining trend. Horned larks seem particularly abundant on the Quemado route. The horned lark has not been documented as occurring within the Sheep Basin Project area where low seral stage mountain grassland is limited.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of degradation or elimination of potential habitat due to catastrophic wildfire would increase. Unless catastrophic wildfire occurred, horned lark habitat would continue to decline as conifer encroachment into grasslands occurs.

Alternatives 2-6 direct effects would include human disturbance during project implementation. There would be an immediate marginal increase in the acreage of mountain grassland. Grassland restoration would occur on approximately 223 acres where encroachment conifers less than 18.0" DBH would be removed. Meadows and treated grasslands would be broadcast burned. Overall long-term habitat quality should improve by project implementation.

Indirect effects would include the reduction in the risk of degradation or elimination of habitat due to catastrophic wildfire. Project implementation would not have a detectable effect on the population trend of the horned lark on the Gila National Forest.

Plain (Juniper) Titmouse

Within the 1,591,082 acres of woodlands on the Gila National Forest, habitat is abundant for the plain titmouse. Four Breeding Bird Survey routes were used to evaluate trend on the Gila National Forest. The Reserve and Emory routes (Rt. 69 and 76 respectively) are on the Forest, and part of the Horse Springs route (Rt. 19) is also on the Forest. Data from the Quemado route (Rt. 63) are also included due to its proximity to the Forest, and to its similar piñon-juniper habitat. The plain titmouse was regularly detected on the Emory and Reserve routes from 1993 to 2000. The plain titmouse was also regularly detected on the Quemado route from 1995 to 1997 (no subsequent data available). This species was detected on the Horse Springs route in 1975 and 1977, however it has not been detected since then.

Trend estimates for Reserve and Emory indicate an increasing trend in the plain titmouse on the Gila National Forest. Analyzing population change on survey routes is probably the most effective use of BBS data, however these data do not provide an explanation for the causes of population trends (Sauer, 2001). Across the Gila National Forest, the acreage of high seral condition woodland has remained stable. With approximately 1,591,082 acres of woodland vegetation type on the Gila National Forest, cavities are expected to be abundant for this species.

Breeding Bird Survey Route 69 traverses the Sheep Basin Project area. The plain (juniper) titmouse was documented as occurring in the Sheep Basin Project area (Hawks Aloft, Inc. 1999) where some high seral stage piñon/juniper habitat occurs.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of degradation or elimination of habitat due to catastrophic wildfire would increase.

Alternatives 2-6 direct effects would human disturbance during project implementation. There would be an immediate marginal increase in the acreage of high seral stage pinyon-juniper woodlands. Thinning and broadcast burning would occur across approximately 778 to 1,042 acres of piñon/juniper woodlands where stand densities would be reduced 30-60%. No tree larger than 18.0" DBH would be removed. Indirect effects would include the reduction in the risk of degradation or elimination of habitat due to catastrophic wildfire. Overall long-term habitat quality should improve by project implementation. Project implementation would not have a detectable effect on the population trend of the plain (juniper) titmouse in the Gila National Forest.

Sonora Sucker and Desert Sucker (See also previous analyses.)

Long-term monitoring of Sonora and desert suckers has occurred on five sites within the Gila National Forest (Propst 2001). The five sites are: 1) Tularosa River at Eagle Peak Road, 2) West Fork Gila River at Gila Cliff Dwellings, 3) Middle Fork Gila River at Trailhead, 4) East Fork Gila River at Fowler Ranch/Fall Spring, and 5) Gila River at Riverside. All sites have been monitored since 1988 with the exception of the West Fork Gila River, where monitoring was initiated in 1989 (Propst, 2001).

Sampling in autumn of 2000 was confounded by high flows; therefore sampling efficiency was diminished (Propst, 2001). There is considerable year-to-year variation in Sonora sucker and desert sucker densities, however no indication of a long-term positive or negative trend (Dave Propst, NMDGF ichthyologist, pers. comm., 4/2002).

The Forest Fisheries Biologist determined that implementation of the Sheep Basin Project may impact the Sonora and desert suckers in the short term but the impacts are not likely to result in a trend toward Federal listing or loss of viability.

Overall long-term habitat quality should improve by project implementation. Project implementation would not have a detectable effect on population trends of Sonora and desert suckers on the Gila National Forest.

Migratory Birds

Several migratory birds are addressed above under threatened, endangered, sensitive, and management indicator species. The New Mexico Partners in Flight Bird has identified highest priority species, priority species, and high responsibility species (Rustay 2000). All New Mexico breeding species were scored on global and New Mexico abundance, global and New Mexico breeding distribution, threats to breeding and wintering grounds, global winter distribution and the importance of New Mexico for breeding.

Management activities that result in temporary habitat fragmentation are likely to have the most negative impacts to migratory birds. Much of the project area is in a moderately closed to closed canopied young and mid-age class. Temporary habitat fragmentation in the form of conversion of the existing dense young forest to open-canopied stands would occur in varying degrees according to alternative. Substantial opening of forest canopies whether trees are young, mid-age, and mature or overmature, would be detrimental to those species that are dependent on moderately closed and closed canopies, but beneficial to species that prefer open canopies.

The removal of large yellow bark trees, particularly those in groups, is especially harmful to species that are dependent on mature and overmature trees such as primary and secondary cavity nesters. These older trees often contain cavities and a richer prey base as well as provide a source of future snags. Of the species on the priority and high responsibility list, 32% use large tree and snag cavities.

Migratory birds are not necessarily species of concern but do illustrate the importance of the area to New Mexican avifauna. Of the numerous migratory birds that likely occur in and near the project area, the following have been documented as occurring there.

Acorn woodpecker - <i>Melanerpes formicivorus</i>	Northern goshawk - <i>Accipiter gentilis</i>
American kestrel - <i>Falco sparverius</i>	Olive-sided flycatcher - <i>Contopus borealis</i>
American robin - <i>Turdus migratorius</i>	Pinyon jay - <i>Gymnorhinus cyanocephalus</i>
Ash-throated flycatcher - <i>Myiarchus cinerascens</i>	Plumbeous vireo - <i>Vireo plumbeus</i>
Band-tailed pigeon - <i>Columba fasciata</i>	Purple martin - <i>Progne subis</i>
Broad-tailed hummingbird - <i>Selasphorus platycercus</i>	Pygmy nuthatch - <i>Sitta pygmaea</i>
Brown creeper - <i>Ruby-crowned kinglet</i>	Red crossbill - <i>Loxia curvirostra</i>
Bushtit - <i>Psaltriparus minimum</i>	Red-breasted nuthatch - <i>Sitta canadensis</i>
Chipping sparrow - <i>Spizella passerina</i>	Red-faced warbler - <i>Cardellina rubrifrons</i>
Clark's nutcracker - <i>Nucifraga columbiana</i>	Red-tailed hawk - <i>Buteo jamaicensis</i>
Common nighthawk - <i>Chordeiles minor</i>	Rufous hummingbird - <i>Selasphorus rufus</i>
Common raven - <i>Corvus corax</i>	Spotted towhee - <i>Pipilo maculatus</i>
Cooper's hawk - <i>Accipiter cooperii</i>	Steller's jay - <i>Cyanocitta stelleri</i>
Cordilleran flycatcher - <i>Empidonax occidentalis</i>	Townsend's solitaire - <i>Myadestes townsendi</i>
Dark-eyed junco - <i>Junco hyemalis</i>	Turkey vulture - <i>Cathartes aura</i>
Gray flycatcher - <i>Empidonax wrightii</i>	Violet-green swallow - <i>Tachycineta thalassina</i>
Great-horned owl - <i>Bubo virginianus</i>	Virginia's warbler - <i>Vermifora virginiae</i>
Hairy woodpecker - <i>Picoides villosus</i>	Western bluebird - <i>Sialia mexicana</i>
Hermit thrush - <i>Catharus guttatus</i>	Western tanager - <i>Piranga olivacea</i>
Juniper titmouse - <i>Baeolophus griseus</i>	Western wood-pewee - <i>Contopus sordidulus</i>
Lesser goldfinch - <i>Carduelis psaltria</i>	White-breasted nuthatch - <i>Sitta carolinensis</i>
Lewis' woodpecker - <i>Melanerpes lewis</i>	White-throated swift - <i>Aeronautes saxatalis</i>
Mountain chickadee - <i>Poecile gambeli</i>	Williamson's sapsucker - <i>Sphyrapicus thyroideus</i>
Mourning dove - <i>Zenaida macroura</i>	Yellow-rumped warbler - <i>Dendroica coronata</i>
Northern flicker - <i>Colaptes auratus</i>	Zone-tailed hawk - <i>Buteo albonotatus</i>

The following species may occur in the Sheep Basin Project but have not been documented as occurring there:

Flammulated owl	<i>Otus flammeolus</i>
Ferruginous hawk	<i>Buteo regalis</i>
Gray vireo	<i>Vireo vicinior</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>

The following charts are from New Mexico Partners in Flight and include only those species that occur or may occur in the Sheep Basin Project:

Pinyon-Juniper Priority Species

Highest Priority	Priority	High Responsibility
Ferruginous hawk	Loggerhead Shrike	Ash-throated Flycatcher
Gray Flycatcher	Western Bluebird	Pinyon Jay
Gray Vireo	Virginia's Warbler	Juniper Titmouse

Ponderosa Pine Priority Species

Highest Priority	Priority	High Responsibility
Northern Goshawk	Lewis' Woodpecker	Broad-tailed Hummingbird
Mexican Spotted Owl	Williamson's Sapsucker	Western Wood-Pewee
Flammulated Owl	Olive-sided Flycatcher	Plumbeous Vireo
Virginia's Warbler	Dusky Flycatcher	Dark-eyed Junco
	Pygmy Nuthatch	
	Western Bluebird	
	Red-faced Warbler	

Additional Representative Species: Band-tailed Pigeon

Mixed Conifer Forest Priority Species

Highest Priority	Priority	High Responsibility
Northern Goshawk	Flammulated Owl	Broad-tailed Hummingbird
Mexican Spotted Owl	Cordilleran Flycatcher	Violet-green Swallow
Williamson's Sapsucker	Clark's Nutcracker	Dark-eyed Junco
Olive-sided Flycatcher	Townsend's Solitaire	
Red-faced Warbler		

Additional Representative Species: Red-breasted Nuthatch

Plains and Mesa Grassland Priority Species

Highest Priority	Priority	High Responsibility
Ferruginous Hawk	Loggerhead Shrike	none

Alternative 1 would not modify migratory habitat in the short-term as existing environmental conditions and trends would continue. In the foreseeable future, the risk of degradation or elimination of habitat due to catastrophic wildfires would increase.

Alternative 2, with the removal of large trees, although relatively small in number, would somewhat lower the quality of existing cavity habitat and future snags. It would also remove large trees from existing groups. Several migratory birds use large tree and snag cavities. Undoubtedly, some of these large trees contain dwarf mistletoe-induced brooms utilized by some of these birds. Alternative 2 would target trees infested with mistletoe as a high priority for removal. It is predicted that over 800 acres of moderately dense and dense habitat would be converted to fairly open habitat. Harvest would occur in stands to be managed towards old growth conditions, and potential wildlife corridors.

Alternative 3 would not remove any trees greater than 12.0" in diameter but would also target trees infested with mistletoe. These trees may contain brooms but due to their size are less likely to be used by birds than those in Alternative 2. It is predicted that over 900 acres of moderately dense and dense habitat would be converted to fairly open habitat. Harvest would occur in stands to be managed towards old growth conditions, and potential wildlife corridors.

Alternative 4 would not remove any trees greater than 16.0" in diameter but would also target trees infested with mistletoe for removal. It would treat more mistletoe-infested acreage (156 acres) using the group selection method than Alternative 3 and less infested acreage (77 acres) with the group selection method than Alternative 2. As with Alternative 3, these trees may contain brooms but due to their size are less likely to be used by birds than those in Alternative 2. This alternative

would not remove trees from existing groups. It is predicted that nearly 1,100 acres of moderately dense and dense habitat would be converted to fairly open habitat. Harvest would not occur in stands to be managed towards old growth conditions, or in designated wildlife corridors.

Alternative 5 would remove some of the largest trees available and would lower the availability of the largest existing cavity habitat and future snags. It would also remove large trees from existing groups. Undoubtedly, some of these large trees contain dwarf mistletoe-induced brooms utilized by some of these birds, and this alternative would target trees infested with mistletoe as a high priority for removal. It is predicted that nearly 1,200 acres of moderately dense and dense habitat would be converted to fairly open habitat. Harvest would occur in stands to be managed towards old growth conditions and potential wildlife corridors.

Alternative 6, with the retention of all yellow bark ponderosa pines, would maintain most of the large trees that contain existing cavity habitat and are future snags. These trees would remain in existing groups. A small number of large trees that do not have yellow bark would be removed due to dwarf mistletoe infestation. Some migratory birds use dwarf mistletoe-induced brooms that would be targeted for removal. It is predicted that 41% of the area would have an open canopy, 30% would be moderately open, 19% dense, and 10% very dense following project implementation. Harvest would not occur in stands to be managed towards old growth conditions, or in designated wildlife corridors.

This alternative would not remove trees from existing groups, and would convert substantially less acreage of moderately closed and closed canopy habitat to open canopy habitat than Alternatives 2, 3, and 5, would not harvest in stands to be managed towards old growth conditions, and would provide habitat connectivity. It would have the least detrimental impact to migratory birds in the short-term of any action alternative.

Whichever alternative is implemented, the effects would be positive for some migratory birds and negative for others in either the short- or long-term.

Other Wildlife Considerations

The following listed and non-listed species may occur, or historically occurred within or near the Sheep Basin project area. Implementation of Alternatives 1-6 would not affect, impact, or jeopardize any species, including habitat, listed below (Project Record 117).

Southwestern willow flycatcher
Bald eagle
Mexican gray wolves
Jaguar
Mountain silverspot butterfly

Bell's vireo
Common black-hawk
Western yellow-billed cuckoo
Chiricahua dock

Implementation of Alternatives 1-6 would have no impact on or would not jeopardize the following threatened, endangered, proposed listed, candidate, or sensitive species because either: (1) the project area is not within the described historic or current range of the species or; (2) the species has been extirpated from the project area or; (3) potential habitat does not occur in the project area or; (4) no state-accepted sight records have occurred since 1970 for the mountain range where the project area is located or; (5) no animal damage control programs are in effect or proposed in the project area.

Jaguarundi - (<i>Felis femoralis septentrionalis</i>)	Yaqui chub - (<i>Gila purpurea</i>)
Ocelot - (<i>Felis pardalis</i>)	Rio Grande cutthroat trout (<i>Oncorhynchus clarki virginalis</i>)
Black-footed ferret - (<i>Mustela nigripes</i>)	Yaqui topminnow - (<i>Poeciliopsis occidentalis sonoriensis</i>)
Lesser long-nosed bat - (<i>Leptonycteris curasoae yerbabuena</i>)	Chihuahua chub - (<i>Gila nigrescens</i>)
Mexican long-nosed bat - (<i>Leptonycteris nivalis</i>)	Gila topminnow - (<i>Poeciliopsis occidentalis occidentalis</i>)
Western red bat (<i>Lasiurus blossevilli</i>)	Gila trout - (<i>Oncorhynchus gilae</i>)
Western yellow bat (<i>Lasiurus xanthinus</i>)	Arizona agave - (<i>Agave arizonica</i>)
New Mexico jumping mouse (<i>Zapus hudsonicus luteus</i>)	Arizona cliffrose - (<i>Purshia subintegra</i>)
Mt. Graham red squirrel - (<i>Tamiasciurus hudsonicus grahamensis</i>)	Arizona hedgehog cactus - (<i>Echinocerus triglochidiatus arizonica</i>)
Coati (<i>Nasua nasua</i>)	Arizona willow - (<i>Salix arizonica</i>)
Northern aplomado falcon - (<i>Falco femoralis septentrionalis</i>)	Goodding's onion (<i>Allium gooddingii</i>)
Brown pelican - (<i>Pelecanus occidentalis</i>)	Hess's fleabane (<i>Erigeron hessii</i>)
Cactus ferruginous pygmy owl - (<i>Glaucidium brasilianum cactorum</i>)	Holy ghost ipomopsis - (<i>Ipomopsis sancti-spiritus</i>)
Least tern - (<i>Sterna antillarum athalossos</i>)	Keunzler's hedgehog cactus - (<i>Echinocerus fendleri kuenzleri</i>)
Mountain plover - (<i>Charadrius montanus</i>)	Lloyd's hedgehog cactus - (<i>Echinocerus fendleri lloydii</i>)
Thick billed parrot - (<i>Rhynchopsitta pachyrhyncha</i>)	Mimbres figwort (<i>Scrophularia macrantha</i>)
Whooping crane - (<i>Grus americana</i>)	Mogollon death camus (<i>Zigadenus mogollonensis</i>)
Yuma clapper rail - (<i>Rallus longirostris yumaensis</i>)	Parish's alkali grass (<i>Puccinellia parishii</i>)
New Mexico ridgenosed rattlesnake (<i>Crotalus willardi obscurus</i>)	Pima pineapple cactus - (<i>Coryphantha scheeri var. robustispina</i>)
Lowland leopard frog (<i>Rana yavapaiensis</i>)	Pinos Altos flame flower (<i>Talinum humile</i>)
Roundtail chub - (<i>Gila robusta</i>)	Porsild's starwort (<i>Stellaria porsildii</i>)
Headwater chub - (<i>Gila nigra</i>)	Sacramento Mountains thistle - (<i>Cirsium vinaceum</i>)
Beautiful shiner - (<i>Cyprinella formosa</i>)	Sacramento prickly poppy - (<i>Argemone pleiacantha pinnatisecta</i>)
Boneytail chub - (<i>Gila elegans</i>)	Santa Fe cholla (<i>Opuntia viridiflora</i>)
Colorado squawfish - (<i>Ptychocheilus lucius</i>)	San Francisco Peaks groundsel - (<i>Senecio franciscanus</i>)
Desert pupfish - (<i>Cyprinodon macularius macularius</i>)	Sentry milk vetch - (<i>Astragalus cremnophylax var. cremnophylax</i>)
Humpback chub - (<i>Gila cypha</i>)	Sneed pincushion cactus - (<i>Hedeoma todosenii</i>)
Little Colorado spinedace - (<i>Lepidomeda vittata</i>)	Wootton's hawthorn (<i>Crategus woottoniana</i>)
Pecos gambusia - (<i>Gambusia nobilis</i>)	Zuni (rhizome) fleabane - (<i>Erigeron rhizomatus</i>)
Pecos bluntnose shiner - (<i>Notropis simus pecosensis</i>)	Alamosa springsnail - (<i>Tryonia alamosae</i>)
Razorback sucker - (<i>Xyrauchen texanus</i>)	Gila spring snail (<i>Fontelicella [Pyrgulopsis] gilae</i>)
Rio Grande silver minnow - (<i>Hybognathus amurus</i>)	Iron Creek woodland snail (<i>Ashmunella mendax</i>)
Sonora chub - (<i>Gila ditaenia</i>)	New Mexico hot spring snail (<i>Fontelicella [Pyrgulopsis] thermalis</i>)
Woundfin - (<i>Plagopterus argentissimus</i>)	Oreohelix chloride (<i>Oreohelix pilsbryi</i>)
Yaqui catfish - (<i>Ictalurus pricei</i>)	Blue silverspot butterfly (<i>Crotalus willardi obscurus</i>)

Watershed, Soils, and Air Effects

A detailed analysis for watershed, soils, and air effects (Project Record 121) has been completed and has been summarized and incorporated into the following discussion.

The Sheep Basin Project Area has approximately 15,400 acres and covers approximately 12% of the Negrito Creek fifth code watershed. A smaller project boundary was used for some alternatives. The smaller project area has 6,140 acres and covers 5% of the watershed. The project area is in the western portion of the watershed and drains north through several ephemeral streams towards Negrito Creek. Negrito Creek below the project area has perennial flow and from a state water quality standpoint, the stream is in non-supporting status for high quality coldwater fishery for temperature. The lower portion of Negrito Creek is critical habitat for the loach minnow. Looking at the Terrestrial Ecosystem Survey information for soil stability, which is one measure of watershed condition, there is approximately <1% of the area with no survey; approximately 59% of the area in the stable soil class; 21% in the impaired stability class; and 20% in the unstable class for the larger project area. For the smaller project area, approximately 2% of the project was not surveyed. Approximately 81% was stable; 1% was impaired stability; and 16% unstable. Stable soils have estimated current soil loss below tolerance soil loss. Impaired stability soils have estimated current soil loss above tolerance soil loss but do have the potential to have enough ground cover to bring soil loss below tolerance. Unstable soils have estimated current soil loss above tolerance soil loss and do not have the potential to have enough ground cover to bring soil loss below tolerance. The larger project area has more steep topography and pinyon-juniper woodlands and as a result has more of the area in the impaired or unstable stability classes. There has been a recognized elk/cattle conflict within the area. Elk numbers have been high and there have been recognized impacts to the resources. The State Game and Fish Department has started to issue more elk permits for the area. The Negrito and Frisco Plaza allotments will be going

through a Range NEPA Process within the next few years. A very small portion of the project area is on the Eagle Peak allotment, which has just gone through the Range NEPA Process. There are several RASES transects on Negrito Creek below the project area and the riparian condition is rated as unsatisfactory. Most of Negrito Creek has been excluded from livestock grazing. The remaining portion has had a utilization level set for the riparian area. The riparian condition should be improving. There are 25 miles of open roads, 7 miles closed, and 8 miles decommissioned. There are no trails within the project area. There is presently one small active timber sale in the area, which is called the Apache Forest Health project, started in 1997 and will cut 203 acres.

Alternative 1: This is the No Action Alternative. No projects would be implemented. Other management activities would continue. This may include grazing, personal use dead wood gathering for firewood, road maintenance, fire suppression, and wildfires. There would be no direct effects to the watershed such as new road construction, road reconstruction, acres harvested, acres of pinyon-juniper woodland treated, or acres burned using prescribed burning.

Presently Forest Road 141 is paved within the project area. There is very little watershed impact from this paved roadbed. The other roads, which presently exit off of Forest Road 141, receive very little to no maintenance. Some of the roads are located in drainages or are in need of better road drainage. Some of these roads need to be maintained, closed, or decommissioned. If nothing is done, these roads would continue to erode. Presently there are approximately 25 miles of open roads, 8 miles closed roads, and 4 miles of decommissioned roads.

Looking at the Terrestrial Ecosystem Survey information for soil stability, which is one measure of watershed condition, there is approximately <1% of the area with no survey; approximately 59% of the area in the stable soil class; 21% in the impaired stability class; and 20% in the unstable class for the larger project area. For the smaller project area, approximately 2% of the project was not surveyed. Approximately 81% was stable; 1% was in impaired stability; and 16% unstable. Stable soils have current soil loss below tolerance soil loss. Impaired stability soils have current soil loss above tolerance but have the potential to increase ground cover enough to bring soil loss below tolerance. Unstable soils have current soil loss above tolerance and do not have the potential to have enough ground cover to bring soil loss below tolerance soil loss. Most of the unstable soils have slopes > 40%. Looking at the above information, the watershed condition would be classed as satisfactory.

Due to climate, the lack of fire in the system, grazing impacts, and other factors, tree density and canopy cover has been increasing. These trees compete for light and soil moisture and nutrients. As a result, the vegetative ground cover (vegetation plus litter) under the trees is declining, resulting in a decline in watershed condition. In the ponderosa pine type the ground cover is usually litter from pine needle cast and is usually high enough to hold the soils in place. The herbaceous component (grasses and forbs) is decreasing. In the pinyon juniper zone the litter is usually found under the trees and usually not adequate to hold the soils in place. Between the trees the herbaceous component is decreasing as the tree density and canopy increases. The pinyon-juniper zone is usually where there is not enough vegetative ground cover to hold the soils in place and soil erosion is a problem.

Without the fuels treatment and prescribed burning of the area, fuel loadings and tree densities would continue to increase. There would be no impact to air quality from the prescribed burning. There would be an increased potential for catastrophic fires. If a catastrophic fire does occur

within the area, most of the trees would be killed, the vegetative ground cover removed, and the soils may become hydrophobic (non-wettable). As a result, soil erosion can be very high, soil productivity lost, and downstream sedimentation high. It would take many years for the area to recover from the fire. Water quality downstream may be impacted. Air quality would be affected during the wildfire.

Overall, with no treatments over time the soil and watershed condition would decline, water runoff would become flashier, and there would be a decline in water quality. Air quality would not be impacted due to no burning or harvesting with this alternative. Air quality could be impacted if there is a catastrophic fire.

Alternative 2: With this alternative there would be some direct and indirect effects to the watershed. If this alternative is implemented, it may take 5-10 years to complete all of the proposed projects. No new road construction is planned. Some of the open roads within the area may need to be used for the projects. Approximately 8.2 miles of roads would be decommissioned. Decommissioning activities would include ripping, reshaping, and seeding of the roadbed. This should reduce the erosion from these roadbeds over the long term. There would be some short-term increase of soil erosion due to the exposure of bare soils from the ripping and reshaping activities.

Approximately 3.8 miles of the closed roads may be reopened for harvest activities. The roads may be bladed, and more drainage installed. The improved road drainage should help reduce soil erosion. There would be a short-term increase in erosion due to the exposure of bare soils. At the conclusion of harvesting, the roads would be closed once again. After the harvest, the open road density would be reduced.

This alternative proposes to harvest approximately 28,300 CCF of timber from 5,185 acres. The more acres treated, the higher the impacts to the soil and watershed. This would require more skidding, yarding, and hauling of the ponderosa pine. More acres of pinyon-juniper would have higher impacts by vehicles gathering and removing firewood and this would cause some short-term compaction of soils and reduction in water infiltration.

This alternative would use an herbicide to treat alligator juniper trees or stumps on approximately 1,418 acres. A small amount of herbicide would be hand applied to the base of a tree or a stump after the tree is cut. This herbicide would be absorbed into the soils and within a few months kill the tree. This would have less of a soil and watershed effect due to not exposing bare soils or compacting the soils than treating the trees with a crawler tractor. There may be a slight risk of impacts to water quality due to the use of herbicides. If a high intensity rainfall occurs just after application, the chemicals in the herbicide may be moved through water runoff. The chemical would have to move through two to three miles of ephemeral drainages before it would reach the perennial stream in Negrito Creek.

Over time, the removal of the trees in the area should increase the vegetative ground cover (vegetation + litter) and improve the watershed condition. The removal of trees would reduce the competition for light and soil moisture and nutrients. As a result, ground vegetation should increase over time due to the reduced competition from the trees.

All of the project area would be treated by prescribed fire. Lopping to a 2-foot height would reduce the expected flame lengths and spread the fuels out over the area. If the burn intensities are low

to moderate, impacts to the watershed should be minimal. Hot burn intensities are where there would be impacts and this should be held to a minimum. Preferably, the area should be burned in small blocks spread out over several years. This would lessen the impacts to the watershed as opposed to burning the entire area during one time period. Burning would return the nutrients tied up in the fuels back to the soils and this would improve the soil fertility. There would be 225 acres of machine piling along Forest Road 141. The machine piling would disturb the soil and leave some of it bare. Burning piles concentrates the fuels into one area and would tend to heat the soils more than broadcast burning. The soils under the piles often become hydrophobic and the seeds in the soil tend to be burned up. Piling and burning should be held to a minimum. Overall, the prescribed burning should reduce the potential for hot wildfires and should improve the watershed condition.

There would be a short time impact to the air quality of the area due to the prescribed burning, dust from machinery and trucks, and exhaust from machinery and trucks. A burn permit would be obtained from the state and the prescriptions in the permit would be followed. Most of the soils in the area have formed from basalt parent material. These soils usually tend to have a high amount of rock in the soils, which would limit the amount of dust from the roadbed when it is used.

Overall, there would be short-term impact to the soils, watershed, and air resources. As the projects are completed there should be a long-term improvement of the soils, watershed, and air resources.

Alternative 3: With this alternative the same number of acres would be harvested. Approximately 23,500 CCF of timber would be harvested from 5,185 acres. No trees 12.1" DBH or larger would be harvested. This alternative would have less harvesting impacts than Alternative 2 due to less volume being cut.

There would be no application of herbicides. Where there are alligator juniper stumps, they would be removed (grubbed), either by hand or with a small dozer. Alligator juniper would sprout and grow back if it is just cut with a chainsaw. Hand grubbing the stumps would be difficult; and if the roots are not removed, the stump may sprout. This would have very little ground disturbance. Grubbing the sprout with a small dozer would be the most successful as it would remove the stump from the ground. There would be some ground disturbance as the blade pushes the stump out of the ground. If the tree is cut, the dozer would have to dig into the soil more to get the stump out. There would be a small depression made which would catch and hold water and may lessen the overall impacts. Approximately 1,206 acres would be mechanically treated by this alternative.

There would be a short time impact to the air quality of the area due to the prescribed burning, dust from machinery and trucks, and exhaust from machinery and trucks. A burn permit would be obtained from the state and the prescriptions in the permit would be followed. Most of the soils in the area have formed from basalt parent material. These soils usually tend to have a high amount of rock in the soil, which would limit the amount of dust from the roadbed when it is used.

Overall, this alternative would have less short-term impacts to the watershed due to less volume being harvested. There would be more impacts to the soils with the grubbing of the alligator juniper stumps but would not have the risks involved with the herbicide treatment. Over time, this alternative would show less of a long-term soil and watershed improvement due to less trees being removed from the area.

Alternative 4: With this alternative, everything described in Alternative 2 would be the same except for the volume cut and harvested and how the alligator juniper stumps would be treated. This alternative proposes to harvest approximately 18,900 CCF of timber from about 3,840 acres. This alternative would have the least harvesting impacts of the action alternatives due to lowest volume being cut and lowest acres harvested.

With this alternative, there would be no herbicide or mechanical/manual treatment of alligator juniper sprouts. Sprouting would be treated initially and maintained with prescribed burning. With this type of treatment, there would be no ground disturbance as with the mechanical treatments. There would be no risk with using herbicides. The burning would have an impact by reducing or removing the vegetative ground cover. A hot burn would be needed to impact the alligator juniper stumps and sprouts. It has been shown that alligator juniper sprouts are very resistant to fire. The alligator juniper tops would often turn brown and appear dead. Then, a few months later, there would be new growth. Of the three options to treat alligator juniper stumps and sprouts, this would be the least effective.

There would be a short-term impact to the air quality of the area due to the prescribed burning, dust from machinery and trucks, and exhaust from machinery and trucks. A burn permit would be obtained from the state and the prescriptions in the permit would be followed. Most of the soils in the area have formed from basalt parent material. These soils usually tend to have a high amount of rock in the soils, which would limit the amount of dust from the roadbed when it is used.

Overall, this alternative would have the lowest short-term impacts to the soil and watershed due to the lowest volume and acres being harvested of the action alternatives. This alternative would have the least effective treatment of alligator juniper stumps and sprouts. Over time, this alternative would show less of a long-term soil and watershed improvement due to less trees being removed from the area.

Alternative 5: The activities associated with Alternative 5 are similar to those listed under Alternative 2 with the following differences. With this alternative, the project area boundary would change. There would be additional acres included north of the project area described in the other alternatives. The total project acres would change from 6,143 to 15,379, which is an increase of 9,236 acres. The project bounds up to Negrito Creek. All of the acres within the project would be treated with a broadcast burn. There would be an increased potential for ash and sediment to move into Negrito Creek and affect water quality. This would treat more acres and would reduce the potential for catastrophic wildfires within the area.

This alternative would harvest a total of 5,750 acres, which is 565 acres more than Alternative 2. There would be more short-term impacts to the soils and watershed due to more acres harvested. Over the long term there would be more acres in which the stands would be opened up and there should be an increase in vegetative ground cover, especially in the pinyon-juniper vegetation.

This alternative would treat 1,889 acres with herbicides, which is 471 acres more than Alternative 2.

There would be twelve trick tanks installed to provide water for wildlife. Cattle may be able to use these waters, too. This should improve the distribution and grazing use within the area and may also improve the vegetative ground cover.

Alternative 6: Alternative 6 is very close to Alternative 4 in the number of acres treated by treatment type. Alternative 6 has no diameter limit (with the exception of Mexican Spotted Owl restricted habitat) but it does not harvest yellow pine. Approximately 16,140 CCF would be removed from the 3,858 acres in Alternative 6 and is a decrease of about 2,760 CCF from Alternative 4. This alternative proposes to harvest the least volume of the action alternatives. Within the 3,858 acres, there would be some openings created in the canopy, which would result in better growth of forbs, shrubs, and grasses. There should be more vegetative ground cover in the understory due to fewer trees, which compete for sunlight and soil moisture and soil nutrients. Within the treatment acres there would be less short-term impacts to the watershed and soils due to removing less volume compared to Alternative 4. Over the long term, watershed and soils condition should improve due to more vegetative ground cover in the understory. Outside of the treatment areas, tree density would continue to increase and watershed and soils conditions would decline. There would be a slight reduction in air quality from dust and exhaust when compared to Alternative 4 due to slightly less harvesting.

With Alternative 6, juniper sprouting would be controlled with maintenance prescribed burns as discussed in Alternative 4. Most of the juniper sprouting in the area would be alligator juniper. It has been shown that alligator juniper sprouts are very resistant to fire. After a fire, the tops would often turn brown but are not killed. Then, a few months later, the sprouts would start to grow again. This method of treatment would be less effective than using herbicides as planned with Alternatives 2 and 5 and grubbing as planned with Alternative 3. There would be a short-term reduction in vegetative ground cover due to burning.

Range Resources

Overview: The Sheep Basin Restoration Project Area encompasses 13% of the of the Negrito livestock grazing allotment. The forage base within the project area primarily consists of mountain muhly (*Muhlenbergia montana*), Arizona fescue (*Festuca arizonica*), and blue gramma (*Bouteloua gracilis*) within ponderosa pine stands on higher moisture areas (i.e. north slope meadows and higher elevation) and blue gramma and side oats gramma (*Bouteloua crutispendula*) within pinyon pine and juniper stands on the other drier sites.

This analysis focuses on the potential effects of the proposed actions disclosed in Alternatives 1-6 of the Sheep Basin Restoration Project Environmental Assessment on forage health and productivity within ponderosa pine and pinyon pine/juniper stands.

Literature, guidance material, and data used in the development of the range resource analysis included:

Jameson, D.A. 1967. The relationship of tree overstory and herbaceous understory vegetation. Jour. Range Manage. 20:247:249.

FSH 2209.21 - Range Analysis Handbook.

Silvicultural Report for the Sheep Basin Restoration Project: Project Record 57 and 123

Watershed and Soils Report for the Sheep Basin Restoration Project: Project Record 60 and 121

Alternative 1: The implementation of Alternative 1 would not alter present forage health and productivity within ponderosa pine and pinyon pine/juniper stands. Herbaceous productivity and health would decline over time as the tree canopy increases shade, blocking sunlight on the ground, and as the duff layer increases in thickness, reducing the germination of seeds.

Using Jameson's regression curves in collaboration with the Forest Vegetation Simulator (FVS) from present herbaceous production it is estimated by the year 2020 that Alternative 1 would result in a 24% decrease in herbaceous material across the Sheep Basin Project Area (Project Record 57).

In the event of a high intensity stand-replacing wildfire, the herbaceous cover would be removed (burned) with little chance of recovery, as the fire would likely kill the apical meristem of the plant. In the event that re-habilitation activities such as grass reseeding occur after a high intensity wildfire herbaceous cover may be reintroduced. A high intensity fire would alter the soil structure and potentially reduce soil nutrients (Project Record 121).

Alternative 2: Overall, herbaceous forage in areas that are both cut and burned would benefit from increased sunlight and the reduction of litter and duff.

Broadcast Burn 920 Acres (areas outside of cutting units): Broadcast burning outside of cutting units would increase herbaceous production and health for a short period of time. Without the opening of the canopy cover needle cast litter would again smother the soil, reducing the amount sunlight and nutrients for growth of herbaceous plants. Over time, the litter cover would become reestablished thus inhibiting herbaceous plant establishment.

Broadcast burning would reduce the potential for having a high intensity stand-replacing wildfire, therefore protecting existing herbaceous cover.

Slash: lop/scatter 4998 acres (areas within cutting units): Professional experience has shown increases in the production and health of herbaceous forage in areas where pinyon pine/juniper treatments have occurred on the Black Range Ranger District. Lopping and scattering woody material appears to have provided nutrients and increases the soils capacity to retain moisture. The process of lop and scatter creates safe sites under the branches for more herbaceous species to establish without pressure from grazing ungulates. These pockets of protected herbaceous plants would create a seed source for the surrounding area. Also, the nutrients from the needles (specifically nitrogen) would in time become available for the herbaceous species that are often limited in this region by nitrogen. After the area was burned the herbaceous plant community would have a large surge, and could be maintained with the diminished pinyon/juniper component. The area would be rested from livestock grazing for at least one growing season, after burning.

Broadcast Burn - Slash pile and burn 225 Acres (areas within cutting units): Depending on the temperatures reached within the slash pile, herbaceous material may or may not benefit. Burning of the piles concentrates the fuels into one area and would tend to heat the soils more than broadcast burning. The soils under the piles may become hydrophobic and the seeds in the soil

tend to be burned up, thus not allowing for the establishment of herbaceous forage (Project Record 60).

Pinyon-Juniper Woodland Treatments 1,176 acres: Herbaceous forage production is influenced by tree density (Jameson 1967). Tree density is expressed in terms of basal area per acre or canopy cover (Project Record 57). There are three classes of tree canopy cover:

- (A) represents an open canopy.
- (B) represents a moderately closed canopy.
- (C) represents a closed canopy.

Alternative 2 proposes to reduce the canopy cover of 1,042 acres within the pinyon/juniper stands and would have a positive effect on the establishment of herbaceous forage, forage health, and productivity by reducing competition between the herbaceous and woody component. It is estimated that this effect would last approximately 30 years until the canopy starts to close back in.

Ponderosa Pine Treatments 3,920 acres: Effects on herbaceous plant establishment and forage production are similar to those projected under the pinyon pine/juniper discussion above. The reduction of the canopy cover across 3,920 acres of ponderosa pine stands would have a positive effect on the establishment of herbaceous forage, forage health, and productivity by reducing competition between the herbaceous and woody component. It is estimated that this effect would last approximately 30 years, depending on the site, until the canopy starts to close back in.

Using Jameson's regression curves in collaboration with the FVS from present herbaceous production it is estimated by the year 2020 that Alternative 2 would result in a 30% increase in herbaceous material across the Sheep Basin Project Area (Project Record 57).

Herbicide Treatment: Alternative 2 allows for the application of herbicide following mechanical treatments which would allow for a higher success rate in controlling resprouting of juniper than Alternatives 3, 4, or 6, but with a lower success than Alternative 5 which treats more acres.

Road Maintenance and Decommissioning: Closure techniques such as ripping, reshaping and seeding the roadbed with certified "weed free" grass would enhance the potential for the establishment of herbaceous material within roads being treated.

Alternative 3: Effects associated with Alternative 3 are similar to those listed under Alternative 2 with the following exception. Due to the 12" diameter limit, there would be a slight decrease in the amount of A canopy when compared to Alternative 2, thus reducing the potential establishment of herbaceous forage.

Using Jameson's regression curves in collaboration with the FVS from present herbaceous production it is estimated by the year 2020 that Alternative 3 would result in a 28% increase in herbaceous material across the Sheep Basin Project Area (Project Record 57).

Alligator juniper stumps would be removed (grubbed), either by hand or with a small dozer. Grubbing juniper stumps, which is less efficient than the use of herbicides, has a lower success rate in controlling resprouting. Subsequently, the potential for juniper invasion is higher under this alternative and may negatively effect herbaceous forage over time.

Alternative 4: Effects associated with Alternative 4 are similar to those disclosed under Alternative 2 with the following exception. Due to less acres treated within the ponderosa pine stands, there would be a slight decrease in the amount of A and B canopy when compared to Alternative 2, causing a slight decrease in the potential for herbaceous forage becoming established. The effect of juniper treatment is identical to that of Alternative 3.

Using Jameson's regression curves in collaboration with the FVS from present herbaceous production it is estimated by the year 2020 that Alternative 4 would result in a 26% increase in herbaceous material across the Sheep Basin Project Area (Project Record 57).

Alternative 5: Effects associated with Alternative 5 are similar to those listed under Alternative 2 with the following exception. Due to the amount pinyon pine/juniper stands being converted to grassland and acres of ponderosa pine stands converting to A canopy, there would be an increase for the potential for establishment of herbaceous forage. The effects of herbicide treatment would be similar to those disclosed under Alternative 2 only to a greater degree as more acres are proposed for treatment.

Using Jameson's regression curves in collaboration with the FVS from present herbaceous production it is estimated by the year 2020 that Alternative 5 would result in a 51% increase in herbaceous material across the Sheep Basin Project Area (Project Record 57).

Alternative 6: Effects associated with Alternative 6 are similar to those disclosed under Alternative 2 and 4. The acres treated within the ponderosa pine stands would be the same as Alternative 2, so the amount of A and B canopy would maintain the same potential for herbaceous forage becoming established. The effect of juniper treatment is identical to that of Alternative 3.

Using Jameson's regression curves in collaboration with the FVS from present herbaceous production it is estimated by the year 2020 that Alternative 6 would result in a 30% increase in herbaceous material across the Sheep Basin Project Area (Project Record 57).

Other Effects

Social and Economic Structure: Using forest products contributes to the livelihood of local communities. Although income is realized from Alternatives 2-6, the emphasis of the project is on forest health and does not favor harvesting large diameter trees.

Should Alternative 1 be implemented, no forest products would be made available to small mill owners. Firewood would continue to be available for personal use. No commercial fuelwood sales would be available. Should Alternatives 2, 3, 4, 5, or 6 be implemented, forest products would be made available primarily through a series of small sales. Volumes of the small sales would vary depending on specific harvest areas. Mill owners who were impacted by the 1995 yearlong timber harvesting injunction, could plan on a short-term supply of wood products. A supply of rough-cut lumber would be available through local mills to communities. The degree of products available varies with the greatest amount of product being produced under Alternative 5 followed by Alternatives 2, 4, 6, and 3. Local residents would benefit from personal and commercial firewood cutting. The custom and culture of using local forest products would continue. Local residents may gain temporary income through employment associated with harvest and milling activities.

Should Alternative 1 be implemented, there would be no economic change realized to local, regional, or national economies. Should Alternatives 2, 3, 4, 5, or 6 be implemented, a return on dollars spent would be realized. This return is displayed using a cost benefit ratio. The C/B ratio provides an approximation of the financial return for every dollar spent in implementing the project. The qualitative benefits realized in implementing the Sheep Basin Restoration Project are defined in the environmental effects discussion. Alternative 5 yields the greatest return for every dollar spent on the project followed by Alternatives 2, 4, 6, and 3 (Project Record 124).

By-products of the Sheep Basin Restoration Project would be part of the total timber sale program on the Gila National Forest.

The local economy of Catron County primarily relies on local/state/ federal government jobs, livestock production, small business, and to a lesser degree logging. The percentage of families living below the poverty level in 1990 was 20%. The racial demographics are as follows: 71% White, 28% Hispanic, and other races at 1%. These are the latest estimates based on 1990 US Census data (SWNMCOG 1998).

Catron County's percentage of low income and ethnic minority communities surpass the threshold for Environmental Justice considerations. Alternatives 2-6 would result in net benefits for Catron County's low income and ethnic minority populations and communities by providing job opportunities. Alternative 1 would not contribute opportunities for upward mobility in ethnic minority and low income populations.

The traditional 25% fund proceeds based on harvest revenues would not be realized in Catron County as the County recently opted to participate in another program under P.L. 106-393 "Secure Rural Schools and Community Self-Determination Act of 2000".

According to the summary report for the ponderosa pine partnership Montezuma County, Colorado entitled "Ecology and Economics of Ponderosa Pine Forest Restoration on the Mancos-Dolores District of the San Juan National Forest" (Lynch et al. 1998) in order for a sale with small diameter timber to be economically viable for a purchaser; at least 40% of the sale volume must contain sawlogs over 12"DBH and the remaining 40% can be pulp material. The definition of sawlogs in this report is logs with a DBH (diameter at breast height) of 12" or greater. The report considered logs below 12" DBH to be pulp material. USFS Region 3 including the Gila National Forest consider material nine inches DBH and to be sawlog material. Region 3 considers pulp material to be trees with a diameter from 5 to 8.9 inches DBH.

Given the Southwest Region's definition of sawlog and pulp material it is important to note the mechanical treatment of pulp material (5 inches to 8.9 inches DBH) is expensive and labor intensive. Prospective bidders will have to evaluate if more equipment or employees are needed to treat small diameter material. The harvesting of material over nine inches DBH will help offset the costs but may not offset the costs entirely. Although costs may be offset by larger diameter material, prospective bidders will need to look at individual sales to ensure the sales can be completed with equipment they have or they can use.

Heritage Resources: The latest edition of the National Register of Historic Places has been consulted. No National Register sites are located in the project area. Tribal consultation for Sheep Basin was initiated in November 1999. To date, no concerns regarding general issues or issues specific to Traditional Cultural Properties (TCPs) have been raised regarding the Sheep Basin

Restoration Project area. In the event that an issue is raised, it would be dealt with on a case-by-case basis, following current laws, guidelines, understandings, and agreements.

With the implementation of mitigation measures, this activity would not adversely affect cultural resource sites, and may actually prove beneficial to the long-term preservation of the sites. By following the recommendations, it is believed that the activities proposed in conjunction with the Sheep Basin Restoration Project area within the greater Negrito Watershed would comply with the provisions of the National Historic Preservation Act of 1966, as amended; Executive Order 11593; and the Archaeological Resources Protection Act of 1979 (Project Record 38).

Special Designations: No activities would occur in wilderness, roadless areas, research natural areas, or wild and scenic rivers.

Visual Quality and Recreation Use: The Sheep Basin Restoration Project Area is categorized as a common variety class. The visual features within the area contain variety in form, line, color and texture or combinations thereof but tend to be common throughout when compared with the larger Negrito Ecosystem.

Features do not tend to be outstanding in visual quality. Most of this area has experienced some type of vegetation modification in the past (i.e. timber harvest, fire wood harvest and grazing). Alternatives 2-6 would slightly alter visual quality due to slight differences in treatments. The slash treatment would result in short term negative visual effects.

Short-term reductions in recreation use could result from the need to limit use during vegetation treatment and burning, but in the long term, Alternatives 2-6 would not affect the type or number of recreational bound visitors attracted to the area (Project Record 45).

Transportation System: The southern portion of the project area is bisected by Forest Road 141, which is paved and is the main access to Negrito Fire Base. Arterial roads to FR 141 were constructed for access to past timber sales or range improvements. There are no trails within the project area.

There would be no change in the existing road system should Alternative 1 be implemented. Road maintenance would remain on its current schedule.

Road decommissioning activities proposed for Alternatives 2-6 are identical. There would be an overall reduction of approximately 8.24 miles of roads.

Public Safety: Treatments under Alternatives 2-6 are not anticipated to impact public safety. Herbicide would be applied according to label standards and supervised by certified applicators (issue 1). Under Alternative 1 the risk of a catastrophic fire is greater than Alternatives 2-6 which could negatively affect public safety. Conversely, public safety may be improved by the reduced risk of a catastrophic wildfire under Alternatives 2-6. Should haul routes be needed to implement activities, the routes would be designated and signed to reduce negative impacts to public safety.

Cumulative Effects

This analysis is based on information from the updated Negrito Ecosystem Analysis Report. This report was written as a tool for management to design projects and provides a comprehensive listing of projects that have occurred in the past. It is a National Forest Management Act (NFMA) document and was never intended to be a decision document, such as an EA or EIS, written under the guidelines of the National Environmental Protection Act. The Negrito Ecosystem Analysis Report was designed to be a “living” document that is revised with time, additional information, and changes in management direction. While the Negrito Ecosystem Analysis Report provides recommendations of projects to consider, it is not intended to define what are “reasonable and foreseeable” future projects. For purposes of this analysis “reasonable and foreseeable” projects are those for which compliance work has been started (scoping) and/or are funded projects.

Ponderosa pine forests evolved with fire and require relatively frequent, low to moderate intensity burning to maintain healthy conditions. Fires were effective in maintaining a variety of stand components. Mature trees usually survived ground level fires that thinned out seedlings and created a productive understory of herbaceous plants and crown-sprouting shrubs.

Decades of fire suppression in the Negrito 5th code watershed, along with other factors such as climate, have altered forest successional stages, increased young tree densities, reduced tree growth, stagnated nutrient cycles, and decreased forage quality and quantity. Fire suppression has also resulted in decreased on-site water availability, decreased ground water recharge and stream flow, and increased fuel continuity and fuel loads.

Wildlife species richness is currently reduced from what may have historically occurred due to the numerous homogeneous stands that contain high densities of small diameter trees, closed canopies with interlocking crowns, scattered clumps of large diameter, mature and overmature ponderosa pines, limited numbers of large snags, and a lack of understory vegetation. The risk of large-scale catastrophic wildfires is now the greatest threat to the continued existence of numerous wildlife species in the watershed.

Within the past 31 years there have been a total of 519 wildfires within the watershed. Since 1987, about 9,000 acres (7%) of the watershed have been burned through wildfires. Most of the wildfires were low to moderate intensity ground fires that did not burn uniformly across the landscape. Stand-replacement wildfires were limited to several hundred acres due to aggressive fire suppression. They were due to accumulated high fuel loadings, drought, topography (steep slopes), weather (high winds), and increased stand densities (Project Record 119).

As shown in Table 5, over the past 10 years, approximately 5,930 acres have been broadcast burned in the Sheep Basin Project area under Alternatives 1-4 and 6. In Alternative 5, 8,852 acres have been treated by broadcast burning. These fires were generally low to moderate intensity ground fires that burned in a mosaic pattern. Fire intensities increased on steep slopes and in dense pockets of trees where some torching of trees occurred. Mainly small diameter trees were killed but mortality of some large trees also occurred (Project Record 119). Occasionally, large snags and downed logs were consumed as well as most logging slash and other small woody debris.

Since 1983, approximately 53,600 acres (42%) of the watershed have been burned through management-ignited fires. The effects of these fires on forest and woodland stands were similar to what occurred in the Sheep Basin Project. Currently fuels tonnage ranges from 1 to 20 tons per acre. Fuels produced by harvest activities are expected to create an additional 5-10 tons per acre.

Nearly 39,000 acres in the watershed would be burned with management-ignited fires in the reasonably foreseeable future. Wildfires and prescribed natural fires would also likely occur.

The reintroduction of fire into the watershed would result in overall wildlife habitat improvement, as suitable habitat for many wildlife species must be renewed by fire.

There are currently ten grazing allotments that are either partially or completely within the watershed. Up to the middle of the 20th century, sheep grazed many of these allotments and extensive over-grazing occurred. All of these allotments have since been converted to cattle grazing. Livestock permittees have constructed and maintained numerous stock tanks in the watershed. These stock tanks provide reliable water sources used by a variety of wildlife that would otherwise be unavailable.

Livestock forage utilization in key areas throughout the watershed is monitored for compliance with established grazing standards. Widespread livestock over-grazing no longer occurs although combined wildlife/livestock forage over-utilization occurs in some key areas in the watershed. In recent years, elk numbers in the watershed have increased sufficiently to negatively impact the forage resource. Consequently, the New Mexico Department of Game and Fish has increased the number of elk permits in the area.

Where broadcast burns have occurred with no vegetation treatments to open the canopy, the increase in forage production and vigor has been short-term. Without the opening of the canopy cover, needle cast litter reduced the ability of herbaceous plants to receive sunlight, moisture, and nutrients and inhibited further herbaceous plant establishment. Where vegetation treatments opened the canopy followed by broadcast burns, forage production and vigor have been longer lasting due to less needle cast litter, and reduced competition between the herbaceous and woody vegetation components (Project Record 122).

There would be a projected increase in herbaceous forage of about 30% in the years following implementation of the Sheep Basin Project. The forage increase would last an estimated 30 years, depending on site, until the canopy starts to close in (Project Record 122).

Forage would likely increase by a similar amount and for a comparable time frame, following implementation of the Apache Forest Health and Six Shooter/Black Deer Projects. Cumulatively, there would be an increased forage base for grazing ungulates, and would benefit other wildlife that depend on an herbaceous understory for all or parts of their life cycles.

In addition to changes in wildlife habitat due to fire suppression, commercial timber sales within and adjacent to the Sheep Basin Project harvested many economically valuable mature and overmature trees, mostly ponderosa pines. Nearly 26,000 acres in the watershed have been logged in the last 30 years. Salvage harvests of fire-killed trees have been limited to about 200 acres. Thinning has occurred on over 1,900 acres since 1984. The thinning projects removed primarily smaller diameter ponderosa pines and allowed for growth of larger trees into the larger size classes.

Approximately 215 miles of roads have been constructed within the Negrito watershed. About 120 miles of roads are unimproved, 91 miles are graveled, and 4 miles are paved. Some of these roads were constructed in and near canyon bottoms and degraded riparian and aquatic habitats. The quality of numerous wildlife corridors was also degraded.

Vehicular use of these roads is a disturbance factor for virtually all wildlife. The temporary opening of roads for vegetation management projects, and activities associated with re-closing and/or obliteration, in addition to subsequent vehicular use, would also disturb wildlife. These disturbances would be short-term. Following road obliteration, vehicular disturbance would be reduced to that caused by off-road vehicles.

A Terrestrial Ecosystem Survey was completed for the Negrito 5th code watershed in 1994. Based on this survey, overall watershed condition is rated as satisfactory (Project Record 121). Approximately 81% of the Sheep Basin Project where harvest activities are proposed is in a stable soil class, and the unstable soils are primarily on slopes greater than 40%. There would be short-term impacts to the soils and watershed in the Sheep Basin Project due to management activities, but in the long-term, there would be an improvement of the resources (Project Record 121).

In the past seven years, eight silt retention dams have been constructed in ephemeral drainages in the watershed. Several gully plugs have also been installed, small diameter ponderosa pines and pinyon-junipers have been thinned near ephemeral drainages, willows have been planted along perennial reaches of streams, and riparian livestock use control fences have been built. These projects were designed to reduce the amount of sedimentation into Negrito Creek.

Thousands of acres of forested stands in the watershed are currently designated as Mexican spotted owl Protected Activity Centers and other protected/restricted habitat. In accordance with the Mexican spotted owl Recovery Plan, silvicultural and other constraints are placed in these habitat types. Northern goshawk standards and guidelines apply to management of forest and woodland communities outside of Mexican spotted owl protected and restricted areas. Combined with a policy of limited silvicultural treatments in roadless areas, less than 39% of the watershed can be actively managed for multiple use and for wildlife species other than the Mexican spotted owl (Project Record 123).

Vegetation management projects are currently proposed in three projects in the watershed to improve overall forest health, restore watershed conditions, and reduce the risk of catastrophic wildfire. With the exception of Sheep Basin Alternative 5, the projects would be in compliance with the Mexican spotted owl Recovery Plan and northern goshawk standards and guidelines as documented in the Record of Decision for Amendment of Forest Plans.

Table 5. Projects in the Negrito Watershed, 1972 - 2002, Reserve Ranger District, Catron County, NM.

Project Name	Type	Year Planned	Status	Description	Acres	Other Outputs	Analysis Area
Eckleberger 1 Burn	MIF	1983	Complete	Fuels Reduction	4977		Elk
N-Bar Burn	MIF	1985	Complete	Fuels Reduction	2275		Gilson
Apache Burn	MIF	1988	Complete	Fuels Reduction	2430		Sheep Basin
Camp Burn	MIF	1989	Complete	Fuels Reduction	2720		Six Shooter/Black Deer
Lost Lake Burn	MIF	1989	Complete	Fuels Reduction	1091		Six Shooter
Eckleberger 2 Burn	MIF	1989	Complete	Fuels Reduction/Eckleberger T.S.	2000		Elk
Black Burro Burn	MIF	1989	Complete	Fuels Reduction Black Burro T.S./completed 1995	9079		Burro
Frisco Plaza Burn	MIF	1992	Complete	Fuels Reduction, NW corner of Negrito Watershed	2922		Frisco
Corner Burn	MIF	1994	Complete	N-bar area to control pine encroachment	20		Gilson
Sheep Basin Burn	MIF	1995	Complete	Fuels Reduction, Sheepbasin T.S.	11924		Sheep Basin 3,500 ac Rainy 4,500 ac Six Shooter/Black Deer 3,924 ac
Sheppard Burn	MIF	1998	Complete	Fuels Reduction	1247		Elk
Burnt Cabin	MIF	1999	Complete	Fuels Reduction/Burnt Cabin T.S.	3926		Gilson
Eckleberger 3 Burn	MIF	2001	Ongoing	Fuels Reduction Completed 9000 ac. in 2001	18601		Elk
Milligan Burn	MIF	2001	In Progress	MIF/PNF	18764		Milligan
Collins Park Burn	MIF	2001	In Progress	MIF/PNF	10449		Burro
Sheppard HB	Wildfire	1994	Complete	Appropriate Suppression Confine Strategy	40		Elk 20 ac Sheppard 20 ac
	Wildfire	1995	Complete	SW of Eagle Peak L.O. 13,000 ac	3771		Milligan
Dutch/Cox	Wildfire	1987	Complete	Appropriate Suppression/Confine Strategy	1500		Davis
Eckleberger	Wildfire	1996	Complete	Shepherders Baseball Park, confined, appropriate suppression	50		Elk
November PNF	Wildfire	1997	Complete	Fire Use	300		Sheppard
Dark	Wildfire	1986	Complete	Full suppression	458		Gilson
Bull	Wildfire	2002	Complete	Full suppression	577		Rainy
Pad	Wildfire	2000	Complete	Escaped Wildfire/Man Caused 9,000 acres	424		Sheppard
BS	Wildfire	1998	Complete	PNF/Declared Wildfire 6,900 acres	1883		Black Deer 200 acres Rainy 200 acres South Fork 1483 acres
Pistol Thinning	Thinning	1984	Complete		155		Six Shooter/Black Deer
Cold Water TSI	Thinning	1992	Complete		220		South Fork
Burnt Thinning	Thinning	1993	Complete		29		Gilson
Eckleberger Thinning	Thinning	1997	Complete	Eckleberger canyon pine encroachment removal	376		Elk
Rocker 98 Thinning	Thinning	1998	Complete	Rocker Timber Sale	20		Gilson
South Fork 98 Thinning	Thinning	1998	Complete	South Fork Timber Sale	115		Gilson
Rainy PJ Thinning	Thinning	1998	Complete		300		Rainy
7HL Thinning	Thinning	1998	Complete	close to Negrito fire base, YCC state coop, 250 ac to date	700		Gilson
Meadow Eradication	Thinning	1998	Complete		9		Gilson
Deep Creek Timber Sale	Timber Sale	1972	Complete		798		Burro
Telephone Timber Sale	Timber Sale	1972	Complete		222		Elk
Pole Timber Sale	Timber Sale	1979	Complete		955		Rainy
Bull Basin Timber Sale	Timber Sale	1980	Complete		5109		Six Shooter
First Pulp Timber Sale	Timber Sale	1984	Complete		3136		Rainy
Eckleberger Timber Sale	Timber Sale	1986	Complete		3030		Elk
Black Burro Timber Sale	Timber Sale	1987	Complete		3404		Burro
Rainy Mesa Timber Sale	Timber Sale	1987	Complete		688		Rainy 340 acres Southfork 348 acres

Table 5 (cont.).

Project Name	Type	Year Planned	Status	Description	Acres	Other Outputs	Analysis Area
Basin Timber Sale	Timber Sale	1990	Complete		2165		Six Shooter/ Black Deer
Dutchman Timber Sale	Timber Sale	1991	Complete		3121		Davis
Burnt Cabin Timber Sale	Timber Sale	1992	Complete		108		Gilson
Little Dutchman Timber Sale	Timber Sale	1993	Complete		114		Davis
Rocker Timber Sale	Timber Sale	1994	Complete		655		Gilson
South Fork Timber Sale	Timber Sale	1994	Complete		400		Gilson
Bull Salvage	Timber Sale	1994	Complete	Salvage of fire killed trees east of Sign Camp mtn.	137		Rainy
Apache Forest Health Project	Timber Sale	1997	In Progress	Sheep Basin Area	203	460 mbf	Sheep Basin
Water Timber Sale	Timber Sale	1998	Complete		959		South Fork
Corner Mountain Salvage	Timber Sale	2000	Complete		80		South Fork
Sheep Timber Sale	Timber Sale	2000	Complete		200		Davis
Beaver Timber Sale	Timber Sale	1990	Complete		330		Sheppard
Gwynn Tank Habitat Improvement	Watershed	1994	Complete	Gwynn tank, close road			Gilson
Timber Dam	Watershed	1994	Complete	Negrito allotment, construct timber dam		1 tank	Rainy
Rainy Mesa Fence	Watershed	1994	Complete	Negrito allotment Riparian use control	20		Rainy
Beaverdam Dams	Watershed	1995	Complete			2 dams	Gilson
N-bar Structures	Watershed	1995	Complete	N-Bar Allotment, 2 silt retention dams		2 dams	Gilson
Eckleberger Dam	Watershed	1996	Complete	Eckleberger canyon		1 dam	Elk
Eckleberger Rehabilitation	Watershed	1998	Complete	Eckleberger Canyon, 3 silt dams, 8 gullyplugs, 200 ac thinning	200	11	Elk
Corner Mountain Allotment	Grazing		In Progress	Open allotment Total allotment 14271	14271	407 AUM's 4 months	Southfork 6,091 ac Sheppard 5,220 ac Gilson 1,071 ac Rainy 149 ac Elk 1,740 ac
Cox Canyon Allotment	Grazing		In Progress	Total allotment is 18855	10635	1346 AUM's 6.5 months	Davis 7,483 ac Burro 3,152 ac
Deadman Allotment	Grazing		In Progress	Total Allotment is 16796	16781	1567 AUM's 12 months	Burro 14,191 ac Davis 1,074 ac Elk 1,516 ac
Eagle Peak Allotment	Grazing		In Progress	Total allotment is 23520	7487	1270 AUM's 5.5 months	Milligan 6,298 ac Frisco 1,115 ac Davis 10 ac Burro 64 ac
Frisco Plaza Allotment	Grazing		In Progress	Total allotment is 36969	4161	1385 AUM's 12 months	Frisco
McCarty Allotment	Grazing		In Progress	Total allotment is 2594	29	68 AUM's 12 months	Milligan 19 ac Frisco 10 ac
Negrito Allotment Yeguas Allotment	Grazing		In Progress	Negrito Total allotment is 42954 Yeguas Total allotment is 11128	42769 11128	6707 AUM's 12 months	Six Shooter/Black Deer 11,766 ac Frisco 4,129 ac Milligan 13,115 ac Rainy 6,248 ac Sheep Basin 5,945 ac Burro 1,565 ac Yeguas Allotment is in the Rainy Analysis Area
T Bar Allotment	Grazing		In Progress	Total allotment is 77218	5967	10560 AUM's 12 months	Gilson 5,852 ac Southfork 3 ac Sheppard 112 ac
Y Canyon Allotment	Grazing		In Progress	Total allotment is 52873	14101	4997 AUM's 12 months	Sheppard 1,464 ac Elk 7,911 ac Burro 4,726 ac

Table 5 (cont.).

Project Name	Type	Year Planned	Status	Description	Acres	Other Outputs	Analysis Area
Sheep Basin Restoration Project	Multi-level	2002	NEPA	Sheep Basin, W. Sign Camp canyon, timber sale, Sheep Basin east to Cienega Sprg. Grassland encroachment removal	3336		Sheep Basin
Black Deer/Six Shooter Vegetation Management Project	Multi-level	2003	NEPA	Blackdeer ridge, Bull Basin, timber sale, Sign Camp mtn, 6shooter saddle, timber sale, Sign Camp Burn	12400		Six Shooter/Black Deer
Burro Ecosystem Vegetation Management Project	Multi-level	2004	Potential	Black Burro/Horse, N.Fork, Barrel, canyons & Collins Park, timber sale, Collins Park pine and mostly juniper encroachment removal, Black Burro Burn	27360		Burro
Road Management	Road Management	1999	Complete	Ecosystem wide, processing of GPS data, then analysis			All

Management units of the Negrito Watershed, Reserve Ranger District, Catron County, New Mexico.



Mostly uneven-aged silvicultural techniques, as well as pre-commercial and commercial thinning, would be applied to ponderosa pine or mixed conifer stands. These projects would manage, in varying degrees, towards more acreage of moderate and high seral condition ponderosa pine and an improved age class distribution. Pinyon/juniper woodlands would be thinned leaving the largest available trees and would increase the acreage of high seral stage pinyon-juniper habitat. Grasslands would be maintained, improved, or restored as encroachment conifers would be removed. Broadcast burns would also occur in these projects as well as in other acreage in the watershed.

These activities would occur within approximately 6,000 acres of the Sheep Basin Project except Alternative 5 where over 15,000 acres would be burned. Some currently closed roads would be temporarily reopened and over 8.0 miles of roads would be obliterated. About 6,000 acres of forest stands, woodlands, and grasslands in the adjoining Six Shooter/Black Deer Project would be treated similar to the Sheep Basin Project. Broadcast burns would occur across over 10,000 acres. Some currently closed roads would be temporarily reopened but active road obliteration would not occur. Only ponderosa pines up to 16.0" in diameter would be harvested on approximately 200 acres of the Apache Forest Health Project. Currently closed roads would not be temporarily reopened, and road obliteration would not occur.

In conjunction with past, present, and foreseeable future management activities, the following cumulative effects are predicted to occur:

Vegetation

Background: As in the Sheep Basin Analysis area, moderately high to very high stand densities occur throughout the Negrito Watershed, this is approximately 127,931 acres in size. Only 19% or approximately 24,659 acres of the Negrito Watershed area has received density management treatment in the last 30 years (Table 5). This has contributed to the existing structure and densities within the ecosystem management area.

Future projects are scheduled to occur in the Negrito Watershed in the near future. Decisions to go forward with the Eckleberger, Collins Park, and Milligan prescribed burns projects, the Apache Forest Health project, and the Sixshooter and Blackdeer Vegetation Management Project (in scoping) have been made, however, no other projects have been proposed within the Negrito Watershed.

While specific treatments have not been proposed in the majority of the Negrito Watershed at this time, it is thought that proposed treatments in other areas of the Negrito Watershed within the ponderosa pine, pinyon-juniper, and grassland cover types would most likely be similar to the treatments proposed in the Sheep Basin Analysis area due to similarities in vegetation densities and structure. Effects of these projects, both direct and cumulative, would be assessed as those projects go through the compliance process.

Cumulative Effects - Stand Density

Alternative 1: No treatment would be implemented; therefore, selection of this alternative would not increase variation in stand densities within the Negrito Watershed. Should no density management treatments occur within the watershed, overall health of the system would decline due to overstocking. Individual tree mortality would increase until stocking levels are decreased.

The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Loss of larger size trees would also occur due to the number of smaller trees present within the stands that are competing for nutrients and moisture. Grassland areas would continue to regenerate into woodland or ponderosa pine stands. This would reduce the available forage over the entire area.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce tree densities in some isolated areas thereby increasing the variation of densities within the watershed slightly. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Change in tree densities from implementation of this project is expected to be minor and less than 1%. Implementation of the Apache Forest Health (timber sale) Project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Change in tree densities within the watershed would be minor due to the small area being treated.

Alternative 2: Selection of this alternative would increase the variation in stand densities within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, ponderosa pine would be treated by tree cutting on 3,920 acres which is approximately 5% of the total ponderosa pine forest type in the Negrito Watershed, pinyon-juniper woodland would be treated by tree cutting on 1,042 acres which is approximately 3% of the total pinyon-juniper woodland cover type in the Negrito Watershed, and grassland would be treated by tree cutting on 223 acres which is approximately 2% of the total grassland cover type in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 351 acres or less than 1% of the ponderosa pine forest type in the watershed. Should no other density management treatments occur within the watershed, as in alternative 1, with the exception of the small area of Sheep Basin, overall health of the system would decline due to overstocking. Individual tree mortality would increase until stocking levels are decreased. The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Loss of larger size trees would also occur due to the number of smaller trees present within the stands that are competing for nutrients and moisture. Grassland areas would continue to regenerate into woodland or ponderosa pine stands. This would reduce the available forage over the entire area.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce tree densities in some isolated areas thereby increasing the variation of densities within the watershed slightly. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Change in tree densities from implementation of this project is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the

Sheep Basin project, although the specifics have yet to be determined. Change in tree densities within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed on stand density would be minor. Treatment of more areas within the Negrito Watershed (such as the Sixshooter and Blackdeer project) in conjunction with implementation of Alternative 2 would be required in order to increase variation in stand densities within the watershed more effectively.

Alternative 3: Selection of this alternative would increase the variation in stand densities within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, ponderosa pine would be treated by tree cutting on 3,920 acres which is approximately 5% of the total ponderosa pine forest type in the Negrito Watershed, pinyon-juniper woodland would be treated by tree cutting on 1,042 acres which is approximately 3% of the total pinyon-juniper woodland cover type in the Negrito Watershed, and grassland would be treated by tree cutting on 223 acres which is approximately 2% of the total grassland cover type in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 88 acres or less than 1% of the ponderosa pine forest type in the watershed. Should no other density management treatments occur within the watershed, as in alternative 1, with the exception of the small area of Sheep Basin, overall health of the system would decline due to overstocking. Individual tree mortality would increase until stocking levels are decreased. The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Loss of larger size trees would also occur due to the number of smaller trees present within the stands that are competing for nutrients and moisture. Grassland areas would continue to regenerate into woodland or ponderosa pine stands. This would reduce the available forage over the entire area.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce tree densities in some isolated areas thereby increasing the variation of densities within the watershed slightly. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Change in tree densities from implementation of this project is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the watershed. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Change in tree densities within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed on stand density would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 3 would be required in order to increase variation in stand densities within the watershed more effectively.

Alternative 4: Selection of this alternative would increase the variation in stand densities within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 5% of the Negrito Watershed. Of this, ponderosa pine would be treated by tree cutting on 2,839 acres which is approximately 4% of the total ponderosa pine forest type in the Negrito Watershed, pinyon-juniper woodland would be treated by tree cutting on 778 acres which is approximately 2% of the total pinyon-juniper woodland cover type in the Negrito Watershed, and grassland would be

treated by tree cutting on 223 acres which is approximately 2% of the total grassland cover type in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 240 acres or less than 1% of the ponderosa pine forest type in the watershed. Should no other density management treatments occur within the watershed, as in alternative 1, with the exception of the small area of Sheep Basin, overall health of the system would decline due to overstocking. Individual tree mortality would increase until stocking levels are decreased. The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Loss of larger size trees would also occur due to the number of smaller trees present within the stands that are competing for nutrients and moisture. Grassland areas would continue to regenerate into woodland or ponderosa pine stands. This would reduce the available forage over the entire area.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce tree densities in some isolated areas thereby increasing the variation of densities within the watershed slightly. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Change in tree densities from implementation of this project is expected to be minor and less than 1%.

The effects on the Negrito Watershed on stand density would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 4 would be required in order to increase variation in stand densities within the watershed more effectively. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Change in tree densities within the watershed would be minor due to the small area being treated.

Alternative 5: Selection of this alternative would increase the variation in stand densities within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 5% of the Negrito Watershed. Of this, ponderosa pine would be treated by tree cutting on 3,920 acres which is approximately 6% of the total ponderosa pine forest type in the Negrito Watershed. Cutting ponderosa pine forest on 155 acres or 2% of the total ponderosa pine forest type in the Negrito Watershed would create grasslands. Cutting pinyon-juniper woodland on 1,042 acres, which is approximately 3% of the total pinyon-juniper woodland cover type in the Negrito Watershed, would create additional grasslands. Grasslands would be maintained by tree cutting on 223 acres which is approximately 2% of the total grassland cover type in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 1,060 acres or 3% of the ponderosa pine forest type in the watershed. Should no other density management treatments occur within the watershed, as in alternative 1, with the exception of the small area of Sheep Basin, overall health of the system would decline due to overstocking. Individual tree mortality would increase until stocking levels are decreased. The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Loss of larger size trees would also occur due to the number of smaller trees present within the stands that are competing

for nutrients and moisture. Grassland areas would continue to regenerate into woodland or ponderosa pine stands. This would reduce the available forage over the entire area.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce tree densities in some isolated areas thereby increasing the variation of densities within the watershed slightly. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Change in tree densities from implementation of this project is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Change in tree densities within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed on stand density would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 5 would be required in order to increase variation in stand densities within the watershed more effectively.

Alternative 6: Selection of this alternative would increase the variation in stand densities within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 5% of the Negrito Watershed. Of this, ponderosa pine would be treated by tree cutting on 2,756 acres which is approximately 4% of the total ponderosa pine forest type in the Negrito Watershed, pinyon-juniper woodland would be treated by tree cutting on 879 acres which is approximately 2% of the total pinyon-juniper woodland cover type in the Negrito Watershed, and grassland would be treated by tree cutting on 223 acres which is approximately 2% of the total grassland cover type in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 240 acres or less than 1% of the ponderosa pine forest type in the watershed. Should no other density management treatments occur within the watershed, as in alternative 1, with the exception of the small area of Sheep Basin, overall health of the system would decline due to overstocking. Individual tree mortality would increase until stocking levels are decreased. The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Loss of larger size trees would also occur due to the number of smaller trees present within the stands that are competing for nutrients and moisture. Grassland areas would continue to regenerate into woodland or ponderosa pine stands. This would reduce the available forage over the entire area.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce tree densities in some isolated areas thereby increasing the variation of densities within the watershed slightly. These projects are to be implemented on 14% of the area and would be low to moderate intensity burns. Change in tree densities from implementation of this project is expected to be minor and less than 1%.

The effects on the Negrito Watershed on stand density would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 6 would be required in order to increase variation in stand densities within the watershed more effectively. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and

Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Change in tree densities within the watershed would be minor due to the small area being treated.

Cumulative Impacts - Dwarf Mistletoe

Direct and indirect evidence indicates that dwarf mistletoe incidence and severity has increased this century (USDA 1995). Dwarf mistletoe would continue to be present in the Sheep Basin analysis area under all alternatives. It would not be eliminated but rather controlled in several stands. Some stands are currently untreatable and would continue to decline health wise with a higher mortality level than stands with a lower tree rating

It is believed that there is an increase in the number and severity of dwarf mistletoe infection within the Negrito Watershed as compared to when stands were more open and less dense. This trend is expected to continue if left untreated. Continued harvest entries over time would not eliminate dwarf mistletoe but would keep mistletoe at a manageable level while still providing wildlife and diversity benefits. Approximately 56,646 acres or 44% of the Negrito Watershed has some level of dwarf mistletoe infection.

Alternative 1: No treatment would be implemented; therefore, selection of this alternative would not decrease dwarf mistletoe infection within the Negrito Watershed. Should mistletoe control not occur within the watershed, overall health of the system would decline slowly as mistletoe levels increase. Spread of mistletoe within the watershed is expected to be slow. As mortality occurs areas with a viable seed source would regenerate. As trees die within the watershed, fuel loadings would increase over time. This would increase the risk of a stand replacing wildfire. Habitat for wildlife species that prefer mistletoe infected stands would not be affected.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed is not expected to decrease mistletoe levels within the watershed. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Any change in mistletoe levels would be minor. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Change in mistletoe levels within the project area is expected to be beneficial. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Change within the watershed would be minor due to the small area being treated.

Alternative 2: Selection of this alternative would decrease mistletoe levels within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, ponderosa pine would be treated by tree cutting on 1,221 acres, which is approximately 2% of the total ponderosa pine forest type infected with dwarf mistletoe in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 233 acres or less than 1% of the ponderosa pine forest type infected with dwarf mistletoe in the watershed. Should no other dwarf mistletoe treatments occur within the watershed, as in alternative 1, overall health of the system would decline slowly as mistletoe levels increase. Spread of mistletoe within the watershed is expected to be slow. As mortality occurs areas with a viable seed source would regenerate. As trees die within the

watershed, fuel loadings would increase over time. This would increase the risk of a stand replacing wildfire.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed is not expected to decrease mistletoe levels within the watershed. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Any change in mistletoe levels would be minor. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Change within the watershed would be minor due to the small areas being treated. Change in mistletoe levels within the project areas is expected to be beneficial. Change within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed on dwarf mistletoe infection would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 2 would be required in order to decrease mistletoe infection within the watershed more effectively.

Alternative 3: Selection of this alternative would decrease mistletoe levels within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, ponderosa pine would be treated by tree cutting on 1,221 acres, which is approximately 2% of the total ponderosa pine forest type infected with dwarf mistletoe in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 0 acres or 0% of the ponderosa pine forest type infected with dwarf mistletoe in the watershed. Should no other dwarf mistletoe treatments occur within the watershed, as in alternative 1, overall health of the system would decline slowly as mistletoe levels increase. Spread of mistletoe within the watershed is expected to be slow. As mortality occurs areas with a viable seed source would regenerate. As trees die within the watershed, fuel loadings would increase over time. This would increase the risk of a stand replacing wildfire.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed is not expected to decrease mistletoe levels within the watershed. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Any change in mistletoe levels would be minor. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Change within the watershed would be minor due to the small area being treated. Change in mistletoe levels within the project areas is expected to be beneficial. Change within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed on dwarf mistletoe infection would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 3 would be required in order to decrease mistletoe infection within the watershed more effectively.

Alternative 4: Selection of this alternative would decrease mistletoe levels within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 12% of the Negrito

Watershed for Alternative 5 and 5% for all other alternatives. Of this, ponderosa pine would be treated by tree cutting on 915 acres, which is approximately 1% of the total ponderosa pine forest type infected with dwarf mistletoe in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 156 acres or less than 1% of the ponderosa pine forest type infected with dwarf mistletoe in the watershed. Should no other dwarf mistletoe treatments occur within the watershed, as in alternative 1, overall health of the system would decline slowly as mistletoe levels increase. Spread of mistletoe within the watershed is expected to be slow. As mortality occurs areas with a viable seed source would regenerate. As trees die within the watershed, fuel loadings would increase over time. This would increase the risk of a stand replacing wildfire.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed is not expected to decrease mistletoe levels within the watershed. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Any change in mistletoe levels would be minor. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Change within the watershed would be minor due to the small area being treated. Change in mistletoe levels within the project areas is expected to be beneficial. Change within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed on dwarf mistletoe infection would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 4 would be required in order to decrease mistletoe infection within the watershed more effectively.

Alternative 5: Selection of this alternative would decrease mistletoe levels within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, ponderosa pine would be treated by tree cutting on 1,002 acres, which is approximately 1% of the total ponderosa pine forest type infected with dwarf mistletoe in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 103 acres by single tree selection method or less than 1% of the ponderosa pine forest type infected with dwarf mistletoe in the watershed. Should no other dwarf mistletoe treatments occur within the watershed, as in alternative 1, overall health of the system would decline slowly as mistletoe levels increase. Spread of mistletoe within the watershed is expected to be slow. As mortality occurs areas with a viable seed source would regenerate. As trees die within the watershed, fuel loadings would increase over time. This would increase the risk of a stand replacing wildfire.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed is not expected to decrease mistletoe levels within the watershed. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Any change in mistletoe levels would be minor. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Change within the watershed would be minor due to the small area being treated. Change in mistletoe levels within the project areas is

expected to be beneficial. Change within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed on dwarf mistletoe infection would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 5 would be required in order to decrease mistletoe infection within the watershed more effectively.

Alternative 6: Selection of this alternative would decrease mistletoe levels within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, ponderosa pine would be treated by tree cutting on 915 acres, which is approximately 1% of the total ponderosa pine forest type infected with dwarf mistletoe in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 156 acres or less than 1% of the ponderosa pine forest type infected with dwarf mistletoe in the watershed. Should no other dwarf mistletoe treatments occur within the watershed, as in alternative 1, overall health of the system would decline slowly as mistletoe levels increase. Spread of mistletoe within the watershed is expected to be slow. As mortality occurs areas with a viable seed source would regenerate. As trees die within the watershed, fuel loadings would increase over time. This would increase the risk of a stand replacing wildfire.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed is not expected to decrease mistletoe levels within the watershed. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Any change in mistletoe levels would be minor. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Change within the watershed would be minor due to the small area being treated. Change in mistletoe levels within the project areas is expected to be beneficial. Change within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed on dwarf mistletoe infection would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 6 would be required in order to decrease mistletoe infection within the watershed more effectively.

Cumulative Impacts - Vegetative Structure

Within the Negrito Watershed, the greatest percent of ponderosa pine forest cover type fall within VSS 3 and 4. This is due primarily to past treatment or lack of treatment. Most of the area has not received any commercial harvest in the last 30 years. VSS 3 comprises approximately 42% of the watershed with VSS 4 approximately 45% of the watershed. All other VSS classes are deficient within the watershed.

Within the Negrito Watershed, the greatest percent of pinyon-juniper woodland cover type fall within VSS 2. VSS 2 comprises approximately 94% of the watershed. All other VSS classes are deficient within the watershed.

Alternative 1: No treatment would be implemented; therefore, selection of this alternative would not change the structural stage classes within the Negrito Watershed. Should no management

treatments occur within the watershed, VSS classes within the area would move slowly toward that which is desirable for northern goshawk habitat as outlined in the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 5/96. Individual tree mortality would increase slowly over time creating openings within the watershed, which would allow natural regeneration and an increase in VSS 1 class. The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Recovery of tree growth would occur as adjacent trees die. This would slowly move the VSS 3 and VSS 4 size class trees into the next larger size class. Loss of larger size trees would also occur due to the number of smaller trees present within the stands that are competing for nutrients and moisture. This too would create openings for regeneration and release of the smaller trees. Canopy closure would be moderate to dense in the majority of the watershed.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas thereby increasing the VSS 1 class within the watershed slightly. These projects are to be implemented on 37% of the area and would be low intensity fires. Increase in VSS 1 from implementation of these projects is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. A slight increase in tree growth rate that would move the stands more rapidly into a VSS 4 class is expected following thinning operations. Change within the watershed would be minor due to the small area being treated.

Alternative 2: Selection of this alternative would change the VSS class distribution within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, ponderosa pine would be treated by tree cutting on 3,920 acres which is approximately 5% of the total ponderosa pine forest type in the Negrito Watershed and pinyon-juniper woodland would be treated by tree cutting on 1,042 acres which is approximately 3% of the total pinyon-juniper woodland cover type in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 351 acres which would create less than 1% VSS 1 within the watershed. With tree thinning of 3,569 acres in the ponderosa pine type, approximately 5% ponderosa pine would move more rapidly into the next VSS size class. Thinning pinyon-juniper stands on 1,042 acres would allow 3% of the pinyon-juniper woodlands to move more rapidly into the next VSS size class within the Negrito Watershed area. Should no management treatments occur within the watershed, as in alternative 1, VSS classes within the area would move slowly toward that which is desirable for northern goshawk habitat as outlined in the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 5/96. Individual tree mortality would increase slowly over time creating openings within the watershed, which would allow natural regeneration and an increase in VSS 1 class. The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Recovery of tree growth would occur as adjacent trees die.

This would slowly move the VSS 3 and VSS 4 size class trees into the next larger size class. Loss of larger size trees would also occur due to the number of smaller trees present within the stands

that are competing for nutrients and moisture. This too would create openings for regeneration and release of the smaller trees. With the exception of the Sheep Basin Area, canopy closure would be moderate to dense in the majority of the watershed.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas thereby increasing the VSS 1 class within the watershed slightly. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Increase in VSS 1 from implementation of this project is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. A slight increase in tree growth rate that would move the stands more rapidly into a VSS 4 class is expected following thinning operations. Change within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed's VSS structure would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 2 would be required to effectively manage VSS structure within the watershed.

Alternative 3: Selection of this alternative would change the VSS class distribution within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, ponderosa pine would be treated by tree cutting on 3,920 acres which is approximately 5% of the total ponderosa pine forest type in the Negrito Watershed and pinyon-juniper woodland would be treated by tree cutting on 1,042 acres which is approximately 3% of the total pinyon-juniper woodland cover type in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 88 acres which would create less than 1% VSS 1 within the watershed. With tree thinning of 3,832 acres in the ponderosa pine type, approximately 5% ponderosa pine would move more rapidly into the next VSS size class. Thinning pinyon-juniper stands on 1,042 acres would allow 3% of the pinyon-juniper woodlands to move more rapidly into the next VSS size class within the Negrito Watershed area. Should no management treatments occur within the watershed, as in alternative 1, VSS classes within the area would move slowly toward that which is desirable for northern goshawk habitat as outlined in the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 5/96. Individual tree mortality would increase slowly over time creating openings within the watershed, which would allow natural regeneration and an increase in VSS 1 class. The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Recovery of tree growth would occur as adjacent trees die. This would slowly move the VSS 3 and VSS 4 size class trees into the next larger size class. Loss of larger size trees would also occur due to the number of smaller trees present within the stands that are competing for nutrients and moisture. This too would create openings for regeneration and release of the smaller trees. With the exception of the Sheep Basin Area, canopy closure would be moderate to dense in the majority of the watershed.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas thereby increasing the VSS 1 class within the watershed slightly. These projects are to be implemented on 37% of the area and would be

low to moderate intensity burns. Increase in VSS 1 from implementation of this project is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. A slight increase in tree growth rate, which would move the stands more rapidly into a VSS 4 class is expected following thinning operation. Change within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed's VSS structure would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 3 would be required to effectively manage VSS structure within the watershed.

Alternative 4: Selection of this alternative would change the VSS class distribution within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 5% of the Negrito Watershed. Of this, ponderosa pine would be treated by tree cutting on 2,839 acres which is approximately 4% of the total ponderosa pine forest type in the Negrito Watershed and pinyon-juniper woodland would be treated by tree cutting on 778 acres which is approximately 2% of the total pinyon-juniper woodland cover type in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 240 acres which would create less than 1% VSS 1 within the watershed. With tree thinning of 2,061 acres in the ponderosa pine type, approximately 3% ponderosa pine would move more rapidly into the next VSS size class. Thinning pinyon-juniper stands on 778 acres would allow 2% of the pinyon-juniper woodlands to move more rapidly into the next VSS size class within the Negrito Watershed area. Should no management treatments occur within the watershed, as in alternative 1, VSS classes within the area would move slowly toward that which is desirable for northern goshawk habitat as outlined in the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 5/96. Individual tree mortality would increase slowly over time creating openings within the watershed, which would allow natural regeneration and an increase in VSS 1 class. The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Recovery of tree growth would occur as adjacent trees die. This would slowly move the VSS 3 and VSS 4 size class trees into the next larger size class. Loss of larger size trees would also occur due to the number of smaller trees present within the stands that are competing for nutrients and moisture. This too would create openings for regeneration and release of the smaller trees. With the exception of the Sheep Basin Area, canopy closure would be moderate to dense in the majority of the watershed.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas thereby increasing the VSS 1 class within the watershed slightly. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Increase in VSS 1 from implementation of this project is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. A slight increase in tree growth rate,

which would move the stands more rapidly into a VSS 4 class is expected following thinning operation. Change within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed's VSS structure would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 4 would be required to effectively manage VSS structure within the watershed.

Alternative 5: Selection of this alternative would change the VSS class distribution within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, ponderosa pine would be treated by tree cutting on 4,800 acres which is approximately 5% of the total ponderosa pine forest type in the Negrito Watershed and pinyon-juniper woodland would be treated by tree cutting on 1,042 acres which is approximately 3% of the total pinyon-juniper woodland cover type in the Negrito Watershed. 155 acres of the ponderosa pine would be reclassified as grassland, and 1,042 acres of pinyon-juniper would be reclassified as grassland. Ponderosa pine regeneration would occur on approximately 1,060 acres which would create less than 1% VSS 1 within the watershed (due to inability to regenerate using single tree selection method with the high basal areas specified in the proposal). With tree thinning of 3,260 acres in the ponderosa pine type, approximately 5% ponderosa pine would move more rapidly into the next VSS size class. Pinyon-juniper stands on 1,042 acres would no longer be managed as woodland but as grass on 3% of the area. Should no management treatments occur within the watershed, as in alternative 1, VSS classes within the area would move slowly toward that which is desirable for northern goshawk habitat as outlined in the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 5/96. Individual tree mortality would increase slowly over time creating openings within the watershed, which would allow natural regeneration and an increase in VSS 1 class. The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Recovery of tree growth would occur as adjacent trees die. This would slowly move the VSS 3 and VSS 4 size class trees into the next larger size class. Loss of larger size trees would also occur due to the number of smaller trees present within the stands that are competing for nutrients and moisture. This too would create openings for regeneration and release of the smaller trees. With the exception of the Sheep Basin Area, canopy closure would be moderate to dense in the majority of the watershed.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas thereby increasing the VSS 1 class within the watershed slightly. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Increase in VSS 1 from implementation of this project is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. A slight increase in tree growth rate, which would move the stands more rapidly into a VSS 4 class is expected following thinning operation. Change within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed's VSS structure would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 5 would be required to effectively manage VSS structure within the watershed.

Alternative 6: Selection of this alternative would change the VSS class distribution within the Negrito Watershed only slightly. The Sheep Basin analysis area is approximately 5% of the Negrito Watershed. Of this, ponderosa pine would be treated by tree cutting on 2,756 acres which is approximately 4% of the total ponderosa pine forest type in the Negrito Watershed and pinyon-juniper woodland would be treated by tree cutting on 879 acres which is approximately 2% of the total pinyon-juniper woodland cover type in the Negrito Watershed. Ponderosa pine regeneration would occur on approximately 240 acres which would create less than 1% VSS 1 within the watershed. With tree thinning of 2,061 acres in the ponderosa pine type, approximately 3% ponderosa pine would move more rapidly into the next VSS size class. Thinning pinyon-juniper stands on 879 acres would allow 2% of the pinyon-juniper woodlands to move more rapidly into the next VSS size class within the Negrito Watershed area. Should no management treatments occur within the watershed, as in alternative 1, VSS classes within the area would move slowly toward that which is desirable for northern goshawk habitat as outlined in the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 5/96. Individual tree mortality would increase slowly over time creating openings within the watershed, which would allow natural regeneration and an increase in VSS 1 class. The risk of loss of trees and possibly stands from insect epidemic or wildfire would increase as stand densities within the watershed increase. Individual tree growth and total stand growth throughout Negrito would rapidly decrease due to site occupancy and competition with other trees for nutrients, moisture, and sunlight. Recovery of tree growth would occur as adjacent trees die. This would slowly move the VSS 3 and VSS 4 size class trees into the next larger size class. Loss of larger size trees would also occur due to the number of smaller trees present within the stands that are competing for nutrients and moisture. This too would create openings for regeneration and release of the smaller trees. With the exception of the Sheep Basin Area, canopy closure would be moderate to dense in the majority of the watershed.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas thereby increasing the VSS 1 class within the watershed slightly. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Increase in VSS 1 from implementation of this project is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. A slight increase in tree growth rate, which would move the stands more rapidly into a VSS 4 class is expected following thinning operation. Change within the watershed would be minor due to the small area being treated.

The effects on the Negrito Watershed's VSS structure would be minor. Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 6 would be required to effectively manage VSS structure within the watershed.

Cumulative Impacts - Mexican Spotted Owl Target/Threshold

Within the Negrito Watershed, there are approximately 24,156 acres which are classified as ponderosa pine - Gambel oak restricted habitat for the Mexican spotted owl (see Negrito Watershed Mexican Spotted Owl Analysis, Sheep Basin Project in Project Record 26). According to the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 5/96, 10% of the pine-oak restricted habitat would be managed to ensure that a sustained level of owl nest/roost (threshold) habitat that is well distributed across the landscape would be provided for.

Existing data available for the Negrito Watershed, with the exception of the Sheep Basin Analysis area, is inadequate to determine whether any of the stands are currently in a threshold condition. Within the Sheep Basin Analysis area, there are approximately 1,376 acres which are classified as ponderosa pine - Gambel oak restricted habitat for the Mexican spotted owl. This is approximately 6% of the total ponderosa pine - Gambel oak restricted habitat within the Negrito Watershed. As previously discussed in this report, within the Sheep Basin Analysis area no stands currently meet the characteristics of target/threshold conditions.

Alternative 1: No treatment would be implemented; therefore, selection of this alternative would not change the existing characteristics within the Negrito Watershed. Over a 100-year period, one stand within the Sheep Basin Analysis Area would obtain the characteristics of a threshold stand. This stand totals 47 acres or less than 1% of the Negrito Watershed restricted habitat. Should no management treatments occur within the watershed, stands designated for target/threshold conditions would move slowly toward that condition. Some stands may already exhibit threshold characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds. The risk of loss of trees and possibly stands from insect epidemic or wildfire are greater in these stands due to the high stand densities which are characteristic of the threshold stands.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas, which would reduce stand density slightly. Region 3 pre and post treatment monitoring plots would be established and evaluated before burning to ensure compliance with guidelines and recommendations for this project. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Openings created by implementing this project are expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated with this project are not classified as Mexican spotted owl restricted habitat, therefore no change in habitat for the Mexican spotted owl is expected.

Alternative 2: Treatment of selected target/threshold stands is expected to increase the distribution of these stands very slightly within the Negrito Watershed. Over a 100-year period, three stands within the Sheep Basin Analysis Area would obtain the characteristics of a threshold stand. These stands totals 129 acres or less than 1% of the Negrito Watershed restricted habitat. Should no management treatments occur within the watershed, stands designated for target/threshold conditions would move slowly toward that condition. Some stands may already

exhibit threshold characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds. The risk of loss of trees and possibly stands from insect epidemic or wildfire are greater in these stands due to the high stand densities which are characteristic of the threshold stands.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas, which would reduce stand density slightly. Region 3 pre and post treatment monitoring plots would be established and evaluated before burning to ensure compliance with guidelines and recommendations for this project. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Openings created by implementing this project are expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated with this project are not classified as Mexican spotted owl restricted habitat, therefore no change in habitat for the Mexican spotted owl is expected.

Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 2 would be required in order to obtain the desired 10% of threshold as recommended in the ROD more rapidly on a site by site basis, unless it is found that stands with these characteristics exist in other areas in the watershed. The effects of alternative 2 treatments on overall threshold management distribution across the landscape would need to be considered as other areas within the Negrito watershed progress through the analysis.

Alternative 3: Treatment of selected target/threshold stands is expected to increase the distribution of these stands very slightly within the Negrito Watershed. Over a 100-year period, three stands within the Sheep Basin Analysis Area would obtain the characteristics of a threshold stand. These stands totals 129 acres or less than 1% of the Negrito Watershed restricted habitat. Should no management treatments occur within the watershed, stands designated for target/threshold conditions would move slowly toward that condition. Some stands may already exhibit threshold characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds. The risk of loss of trees and possibly stands from insect epidemic or wildfire are greater in these stands due to the high stand densities which are characteristic of the threshold stands.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas, which would reduce stand density slightly. Region 3 pre and post treatment monitoring plots would be established and evaluated before burning to ensure compliance with guidelines and recommendations for this project. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Openings created by implementing this project are expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated with this project are not classified as

Mexican spotted owl restricted habitat, therefore no change in habitat for the Mexican spotted owl is expected.

Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 3 would be required in order to obtain the desired 10% of threshold as recommended in the ROD more rapidly on a site by site basis, unless it is found that stands with these characteristics exist in other areas in the watershed. The effects of alternative 3 treatments on overall threshold management distribution across the landscape would need to be considered as other areas within the Negrito watershed progress through the analysis.

Alternative 4: Prescribe burning only would be implemented. Selection of this alternative would change the existing characteristics within the Negrito Watershed very little if at all. Over a 100-year period, one stand within the Sheep Basin Analysis Area would obtain the characteristics of a threshold stand. This stand totals 47 acres or less than 1% of the Negrito Watershed restricted habitat. Should no management treatments occur within the watershed, the majority of stands designated for target/threshold conditions would move slowly toward that condition. Some stands may already exhibit threshold characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds. The risk of loss of trees and possibly stands from insect epidemic or wildfire are greater in these stands due to the high stand densities which are characteristic of the threshold stands.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas, which would reduce stand density slightly. Region 3 pre and post treatment monitoring plots would be established and evaluated before burning to ensure compliance with guidelines and recommendations for this project. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Openings created by implementing this project are expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated with this project are not classified as Mexican spotted owl restricted habitat, therefore no change in habitat for the Mexican spotted owl is expected.

Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 4 would be required in order to obtain the desired 10% of threshold as recommended in the ROD more rapidly on a site by site basis, unless it is found that stands with these characteristics exist in other areas in the watershed. The effects of alternative 4 treatments on overall threshold management distribution across the landscape would need to be considered as other areas within the Negrito watershed progress through the analysis.

Alternative 5: Treatment of selected target/threshold stands is expected to increase the distribution of these stands very slightly if at all within the Negrito Watershed. No stands were selected to be managed toward a target/threshold condition. Over a 10-year period, two stands within the Sheep Basin Analysis Area would convert to oak woodland. These stands totals 96 acres or less than 1% of the Negrito Watershed restricted habitat. Data is unavailable as to whether the remaining stands reach a threshold condition within the next 100 years. Should no management treatments occur within the watershed, stands designated for target/threshold

conditions would move slowly toward that condition. Some stands may already exhibit threshold characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds. The risk of loss of trees and possibly stands from insect epidemic or wildfire are greater in these stands due to the high stand densities which are characteristic of the threshold stands.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas, which would reduce stand density slightly. Region 3 pre and post treatment monitoring plots would be established and evaluated before burning to ensure compliance with guidelines and recommendations for this project. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Openings created by implementing this project are expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated with this project are not classified as Mexican spotted owl restricted habitat, therefore no change in habitat for the Mexican spotted owl is expected.

Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 5 would be required in order to obtain the desired 10% of threshold as recommended in the ROD more rapidly on a site by site basis, unless it is found that stands with these characteristics exist in other areas in the watershed. The effects of alternative 5 treatments on overall threshold management distribution across the landscape would need to be considered as other areas within the Negrito watershed progress through the analysis.

Alternative 6: Prescribe burning only would be implemented. Selection of this alternative would change the existing characteristics within the Negrito Watershed very little if at all. Over a 100-year period, one stand within the Sheep Basin Analysis Area would obtain the characteristics of a threshold stand. This stand totals 47 acres or less than 1% of the Negrito Watershed restricted habitat. Should no management treatments occur within the watershed, the majority of stands designated for target/threshold conditions would move slowly toward that condition. Some stands may already exhibit threshold characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds. The risk of loss of trees and possibly stands from insect epidemic or wildfire are greater in these stands due to the high stand densities which are characteristic of the threshold stands.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may create some openings in isolated areas, which would reduce stand density slightly. Region 3 pre and post treatment monitoring plots would be established and evaluated before burning to ensure compliance with guidelines and recommendations for this project. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Openings created by implementing this project are expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated with this project are not classified as

Mexican spotted owl restricted habitat, therefore no change in habitat for the Mexican spotted owl is expected.

Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 6 would be required in order to obtain the desired 10% of threshold as recommended in the ROD more rapidly on a site by site basis, unless it is found that stands with these characteristics exist in other areas in the watershed. The effects of alternative 6 treatments on overall threshold management distribution across the landscape would need to be considered as other areas within the Negrito watershed progress through the analysis.

Cumulative Impacts – Old Growth Management

Within the Negrito Watershed, there is approximately 72,395 acres, which are classified as ponderosa pine forest cover type, and 31,049 acres, which are classified as pinyon-juniper, cover type (see Negrito Watershed Old Growth Analysis, Sheep Basin Project in Project Record 29). According to the Record of Decision for Amendment of Forest Plans, Arizona and New Mexico, 5/96, 20% of each forest cover type would be managed for old growth characteristics. Forested sites should meet or exceed the structural attributes as depicted in the Record of Decision to be considered old growth.

Existing data available for the Negrito Watershed, with the exception of the Sheep Basin Analysis area, is inadequate to determine whether any of the stands are currently in an old growth condition. Within the Sheep Basin Analysis area, approximately 1,028 acres of ponderosa pine has been designated to manage toward an old growth condition in alternatives 2, 3, and 4. This is approximately 1% of the total ponderosa pine forest cover type within the Negrito Watershed and ?% of the ponderosa pine in the Sheep Basin Project area. Within the Sheep Basin Analysis area, approximately 332 acres of pinyon-juniper has been designated to manage toward an old growth condition. This is approximately 1% of the total pinyon-juniper woodland cover type within the Negrito Watershed and ?% of the pinyon-juniper woodland in the Sheep Basin Project area.

Alternative 1: No treatment would be implemented; therefore, selection of this alternative would not change the existing old growth characteristics within the Negrito Watershed. Over a 100-year period, fourteen ponderosa pine forest cover type stands within the Sheep Basin Analysis Area would obtain the characteristics of an old growth stand. These stands total 764 acres or 1% of the Negrito Watershed ponderosa pine forest type. Over a 100-year period, two pinyon-pine woodland cover type stands within the Sheep Basin Analysis Area would obtain the characteristics of an old growth stand. These stands total 317 acres or 1% of the Negrito Watershed pinyon-juniper woodland type. Should no management treatments occur within the watershed, stands designated for old growth conditions would move slowly toward that condition. Some stands may already exhibit old growth characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce the dead and down woody component of some stands below the level required for an old growth stand. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Total reduction of dead and down woody material is expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management

Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated with this project are not classified as old growth management stands, therefore no change in availability of old growth is expected.

Alternative 2: Treatment of selected old growth stands is expected to change the characteristics of the Negrito Watershed very slightly. Over a 100-year period, ten stands within the Sheep Basin Analysis Area would obtain the characteristics of an old growth stand. These stands total 376 acres or less than 1% of the Negrito Watershed ponderosa pine forest type. Over a 100-year period, two pinyon-pine woodland cover type stands within the Sheep Basin Analysis Area would obtain the characteristics of an old growth stand. These stands total 317 acres or 1% of the Negrito Watershed pinyon-juniper woodland type. Should no management treatments occur within the watershed, stands designated for old growth conditions would move slowly toward that condition. Some stands may already exhibit old growth characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce the dead and down woody component of some stands below the level required for an old growth stand. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Total reduction of dead and down woody material is expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated with this project are not classified as old growth management stands, therefore no change in availability of old growth is expected.

Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 2 would be required in order to obtain the desired 20% of old growth stands as recommended in the ROD more rapidly on a site by site basis, unless it is found that stands with these characteristics exist in other areas in the watershed. The effects of alternative 2 treatments on overall old growth distribution across the landscape would need to be considered as other areas within the Negrito watershed progress through the analysis.

Alternative 3: Treatment of selected old growth stands is expected to change the characteristics of the Negrito Watershed very slightly. Over a 100-year period, ten stands within the Sheep Basin Analysis Area would obtain the characteristics of an old growth stand. These stands total 331 acres or less than 1% of the Negrito Watershed ponderosa pine forest type. Over a 100-year period, two pinyon-pine woodland cover type stands within the Sheep Basin Analysis Area would obtain the characteristics of an old growth stand. These stands total 317 acres or 1% of the Negrito Watershed pinyon-juniper woodland type. Should no management treatments occur within the watershed, stands designated for old growth conditions would move slowly toward that condition. Some stands may already exhibit old growth characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce the dead and down woody component of some stands below the level required for an old growth stand. These projects are to be implemented on 37% of the area and

would be low to moderate intensity burns. Total reduction of dead and down woody material is expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated with this project are not classified as old growth management stands, therefore no change in availability of old growth is expected.

Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 3 would be required in order to obtain the desired 20% of old growth stands as recommended in the ROD more rapidly on a site by site basis, unless it is found that stands with these characteristics exist in other areas in the watershed. The effects of alternative 3 treatments on overall old growth distribution across the landscape would need to be considered as other areas within the Negrito watershed progress through the analysis.

Alternative 4: Prescribe burning only would be implemented. Selection of this alternative would change the existing characteristics within the Negrito Watershed very little if at all. Over a 100-year period, fourteen ponderosa pine forest cover type stands within the Sheep Basin Analysis Area would obtain the characteristics of an old growth stand. These stands total 764 acres or 1% of the Negrito Watershed ponderosa pine forest type. Over a 100-year period, two pinyon-pine woodland cover type stands within the Sheep Basin Analysis Area would obtain the characteristics of an old growth stand. These stands total 317 acres or 1% of the Negrito Watershed pinyon-juniper woodland type. Should no management treatments occur within the watershed, stands designated for old growth conditions would move slowly toward that condition. Some stands may already exhibit old growth characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce the dead and down woody component of some stands below the level required for an old growth stand. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Total reduction of dead and down woody material is expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated with this project are not classified as old growth management stands, therefore no change in availability of old growth is expected.

Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 4 would be required in order to obtain the desired 20% of old growth stands as recommended in the ROD more rapidly on a site by site basis, unless it is found that stands with these characteristics exist in other areas in the watershed. The effects of alternative 4 treatments on overall old growth distribution across the landscape would need to be considered as other areas within the Negrito watershed progress through the analysis.

Alternative 5: Treatment of selected old growth stands is expected to change the characteristics of the Negrito Watershed very slightly. Over a 10-year period, one ponderosa pine stand within the

Sheep Basin Analysis Area would change cover type to oak woodland. This stand totals 9 acres or less than 1% of the Negrito Watershed. One pinyon-juniper stand would be managed as a grassland stand. This stand totals 264 acres or 1% of the Negrito Watershed pinyon-juniper woodland type. Data is unavailable as to whether the remaining stands reach an old growth condition within the next 100 years. Should no management treatments occur within the watershed, stands designated for old growth conditions would move slowly toward that condition. Some stands may already exhibit old growth characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce the dead and down woody component of some stands below the level required for an old growth stand. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Total reduction of dead and down woody material is expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated with this project are not classified as old growth management stands, therefore no change in availability of old growth is expected.

Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 5 would be required in order to obtain the desired 20% of old growth stands as recommended in the ROD more rapidly on a site by site basis, unless it is found that stands with these characteristics exist in other areas in the watershed. The effects of alternative 5 treatments on overall old growth distribution across the landscape would need to be considered as other areas within the Negrito watershed progress through the analysis.

Alternative 6: Prescribe burning only would be implemented. Selection of this alternative would change the existing characteristics within the Negrito Watershed very little if at all. Over a 100-year period, fourteen ponderosa pine forest cover type stands within the Sheep Basin Analysis Area would obtain the characteristics of an old growth stand. These stands total 764 acres or 1% of the Negrito Watershed ponderosa pine forest type. Over a 100-year period, two pinyon-pine woodland cover type stands within the Sheep Basin Analysis Area would obtain the characteristics of an old growth stand. These stands total 317 acres or 1% of the Negrito Watershed pinyon-juniper woodland type. Should no management treatments occur within the watershed, stands designated for old growth conditions would move slowly toward that condition. Some stands may already exhibit old growth characteristics. This would be determined on a site-by-site basis as further analysis within the Negrito watershed proceeds.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may reduce the dead and down woody component of some stands below the level required for an old growth stand. These projects are to be implemented on 37% of the area and would be low to moderate intensity burns. Total reduction of dead and down woody material is expected to be minor and less than 1% of the project area. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. The stands treated

with this project are not classified as old growth management stands, therefore no change in availability of old growth is expected.

Treatment of more areas within the Negrito Watershed in conjunction with implementation of alternative 6 would be required in order to obtain the desired 20% of old growth stands as recommended in the ROD more rapidly on a site by site basis, unless it is found that stands with these characteristics exist in other areas in the watershed. The effects of alternative 4 treatments on overall old growth distribution across the landscape would need to be considered as other areas within the Negrito watershed progress through the analysis.

Cumulative Effects - Alligator Juniper Sprouting Control

Within the Negrito Watershed, there is approximately 77,583 acres, which contain an alligator juniper component (based on walk-through stand exam data). This is approximately 60% of the Negrito Watershed.

Alternative 1: No treatment would be implemented; therefore, selection of this alternative would not change the amount of alligator juniper present within the Negrito Watershed. Alligator juniper would continue to increase in density until site capacity has been reached and mortality begins occurring. Sprouting would occur as individual trees within the watershed are damaged or die. Very little sprouting would occur.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may stimulate sprouting of alligator juniper where it occurs since a low intensity fire would not obtain enough temperature to kill the juniper. Sprouting is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Sprouting of alligator juniper within the project is expected to be minor to none.

Alternative 2: Selection of this alternative would increase alligator juniper sprouting within the Negrito Watershed only slightly with the mechanical treatment and decrease sprouting only slightly with the herbicide application. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, alligator juniper would be treated by tree cutting followed by an herbicide stump sprout hand application on 1,418 acres, which is approximately 2% of the total area where alligator juniper occurs in the Negrito Watershed. Due to the low rates of herbicide applied and the application method used in herbicide application, the area adjacent to the Sheep Basin Analysis area would not be affected. Should no other control of alligator juniper stump sprouting occur within the watershed, as in alternative 1, Alligator juniper would continue to increase in density until site capacity has been reached and mortality begins occurring. Sprouting would occur as individual trees within the watershed are damaged or die. Very little sprouting would occur. Burning outside the herbicide application area would stimulate alligator sprouting if not designed to be intense enough to control the sprouting. If primary objective in other portions of the Negrito watershed is to kill alligator juniper, species more susceptible to fire may be damaged or killed. This is expected to occur on a limited basis.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may stimulate sprouting of alligator juniper where it occurs since a low intensity fire would not obtain enough temperature to kill the juniper. Sprouting is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Sprouting of alligator juniper within the project is expected to be minor to none.

Density control of alligator juniper of more areas by mechanical tree cutting within the Negrito Watershed in conjunction with implementation of alternative 2 would increase overall sprouting of this species. The effects of alternative 2 treatments in the Negrito Watershed are minor.

Alternative 3: Selection of this alternative would increase alligator juniper sprouting within the Negrito Watershed only slightly with the mechanical tree cutting, and decrease this sprouting only slightly with the manual/mechanical treatment of the stump sprouts. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, alligator juniper would be treated by tree cutting followed by manual or mechanical treatment on 1,206 acres, which is approximately 1% of the total area where alligator juniper occurs in the Negrito Watershed. Should no other control of alligator juniper stump sprouting occur within the watershed, as in alternative 1, Alligator juniper would continue to increase in density until site capacity has been reached and mortality begins occurring. Sprouting would occur as individual trees within the watershed are damaged or die. Very little sprouting would occur. Burning outside the Sheep Basin analysis area would stimulate alligator sprouting if not designed to be intense enough to control the sprouting. If primary objective in other portions of the Negrito watershed is to kill alligator juniper, species more susceptible to fire may be damaged or killed. This is expected to occur on a limited basis.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may stimulate sprouting of alligator juniper where it occurs since a low intensity fire would not obtain enough temperature to kill the juniper. Sprouting is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Sprouting of alligator juniper within the project is expected to be minor to none.

Density control of alligator juniper of more areas by mechanical tree cutting within the Negrito Watershed in conjunction with implementation of alternative 3 would increase overall sprouting of this species. The effects of alternative 3 treatments in the Negrito Watershed are minor.

Alternative 4: Selection of this alternative would increase alligator juniper sprouting within the Negrito Watershed only slightly with the mechanical tree cutting and prescribed burning. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, alligator juniper would be treated by tree cutting followed by prescribed burning on 1,207 acres, which is approximately 1% of the total area where alligator juniper occurs in the Negrito Watershed. Should no other control of alligator juniper stump

sprouting occur within the watershed, as in alternative 1, Alligator juniper would continue to increase in density until site capacity has been reached and mortality begins to occur. Sprouting would occur as individual trees within the watershed are damaged or die. Very little sprouting would occur. Burning outside the Sheep Basin analysis area would stimulate alligator sprouting if not designed to be intense enough to control the sprouting. If primary objective in other portions of the Negrito watershed is to kill alligator juniper, species more susceptible to fire may be damaged or killed. This is expected to occur on a limited basis.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may stimulate sprouting of alligator juniper where it occurs since a low intensity fire would not obtain enough temperature to kill the juniper. Sprouting is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Sprouting of alligator juniper within the project is expected to be minor to none.

Density control of alligator juniper of more areas by mechanical tree cutting within the Negrito Watershed in conjunction with implementation of alternative 4 would be increase overall sprouting of this species. The effects of alternative 4 treatments in the Negrito Watershed are minor.

Alternative 5: Selection of this alternative would increase alligator juniper sprouting within the Negrito Watershed only slightly with the mechanical treatment and decrease sprouting only slightly with the herbicide application. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, alligator juniper would be treated by tree cutting followed by an herbicide stump sprout hand application on 1,889 acres, which is approximately 3% of the total area where alligator juniper occurs in the Negrito Watershed. Due to the low rates of herbicide applied and the application method used in herbicide application, the area adjacent to the Sheep Basin Analysis area would not be affected. Should no other control of alligator juniper stump sprouting occur within the watershed, as in alternative 1, Alligator juniper would continue to increase in density until site capacity has been reached and mortality begins occurring. Sprouting would occur as individual trees within the watershed are damaged or die. Very little sprouting would occur. Burning outside the herbicide application area would stimulate alligator sprouting if not designed to be intense enough to control the sprouting. If primary objective in other portions of the Negrito watershed is to kill alligator juniper, species more susceptible to fire may be damaged or killed. This is expected to occur on a limited basis.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may stimulate sprouting of alligator juniper where it occurs since a low intensity fire would not obtain enough temperature to kill the juniper. Sprouting is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Sprouting of alligator juniper within the project is expected to be minor to none.

Density control of alligator juniper of more areas by mechanical tree cutting within the Negrito Watershed in conjunction with implementation of alternative 5 would increase overall sprouting of this species. The effects of alternative 5 treatments in the Negrito Watershed are minor.

Alternative 6: Selection of this alternative would increase alligator juniper sprouting within the Negrito Watershed only slightly with the mechanical tree cutting and prescribed burning. The Sheep Basin analysis area is approximately 12% of the Negrito Watershed for Alternative 5 and 5% for all other alternatives. Of this, alligator juniper would be treated by tree cutting followed by prescribed burning on 1,207 acres, which is approximately 1% of the total area where alligator juniper occurs in the Negrito Watershed. Should no other control of alligator juniper stump sprouting occur within the watershed, as in alternative 1, Alligator juniper would continue to increase in density until site capacity has been reached and mortality begins to occur. Sprouting would occur as individual trees within the watershed are damaged or die. Very little sprouting would occur. Burning outside the Sheep Basin analysis area would stimulate alligator sprouting if not designed to be intense enough to control the sprouting. If primary objective in other portions of the Negrito watershed is to kill alligator juniper, species more susceptible to fire may be damaged or killed. This is expected to occur on a limited basis.

Implementation of the Eckleberger, Collins Park, and Milligan prescribed burns within the watershed may stimulate sprouting of alligator juniper where it occurs since a low intensity fire would not obtain enough temperature to kill the juniper. Sprouting is expected to be minor and less than 1%. Apache Forest Health (timber sale) project would occur on less than 1% of the area. This project would be a thinning from below with a 16" DBH limit. Implementation of the Sixshooter and Blackdeer Vegetation Management Project would occur on less than 10% of the area. This project would include similar treatments to the Sheep Basin project, although the specifics have yet to be determined. Sprouting of alligator juniper within the project is expected to be minor to none.

Density control of alligator juniper of more areas by mechanical tree cutting within the Negrito Watershed in conjunction with implementation of alternative 6 would be increase overall sprouting of this species. The effects of alternative 6 treatments in the Negrito Watershed are minor.

Fuels

Fire management direction continues to evolve as more is learned about the use and effects of fire and its influence on the development of vegetation found in the Negrito Watershed. However, the majority of naturally occurring fires and all human-caused fires not prescribed for management reasons would likely continue to be suppressed due to complex resource issues (i.e. protection of structures, private inholdings, and/or sensitive species habitat).

This policy of fire suppression would limit fire's role in the ecosystem to areas where prescribed fire can be effectively managed or wildfires that escape suppression. In all alternatives, fire suppression effectiveness would be dependent upon the involved fuels, and the types of suppression resources that can be applied to suppression efforts.

Alternative 1: Live and dead fuels would accumulate to a dangerous level in many stands within the project area. The fuels component of the ecosystem would consist of continuous overstory

canopies, dense fuels, and ladder fuels which connect surface and aerial fuels. Summer fires occurring in these stands would exhibit fire behavior that would present serious control problems, result in high levels of stand mortality, and pose a risk to the safety of suppression personnel.

Alternative 2-6: Several proposed actions would act cumulatively with past, ongoing, and foreseeable future actions to reduce fuel loads and affect future abilities to control or suppress fire. In areas where prescribed fire is proposed, fuels would be maintained at levels which would allow for reasonable control of fire. Where prescribed burning does not take place and fire is excluded, an abnormal buildup of fuels would continue.

Within the past 31 years there have been a total of 519 wildfires within the Negrito watershed (Table 5). Wildfires have been dispersed throughout the watershed with 486 less than 10 acres in size. Fuel loadings have increased throughout the watershed, due to aggressive fire suppression. Management Ignited Fires (e.g. Sheep Basin, Apache, Black Burro MIFs), reduced fuel loadings however, prescribed burning in southwestern ponderosa pine can temporarily reduce fuel hazard (Harrington 1981, Sackett 1980), from 0.6 to 1.8 tons per acre of needle litter can be cast annually by ponderosa pine trees (Davis and others 1968, Sackett 1980). Grass and needle cast are the primary fire carriers. Prescribed burning should be a continuing process, not a one time event.

Areas harvested in the past 20 years (Table 5), that were prescribed burned, now burn with less intensity. In the long-term (>10 years), proposed vegetation management, such as thinning, would further decrease fuel loads (aerial and ground). Foreseeable future prescribed fires, are also being considered in proposals for the Black Deer/Sixshooter Vegetation Management Project and additional MIF's (Milligan/Collins Park 29,213 acres, Eckleberger 18,000 acres).

The long-term effect of harvest and thinning would result in future wildfires that burn with less intensity and duration, resulting in less damage to soils and vegetation. Wildfires would be easier to control, increasing the ability to successfully protect existing stands and untreated riparian areas. Future fuel treatments would be easier to implement due to lower fuel loadings. However, the closing of roads would result in a cumulative decrease in access, which would make fire suppression more difficult and increase its cost.

Reducing the fuels over a larger area creates additional safe-zones. When combined with projects scheduled to occur in the Negrito Watershed, Alternatives 2-6 would enhance the natural role of fire within the ecosystem area.

In addition to mechanical treatments there are currently ten grazing allotments within the watershed and two, which cover all of the Sheep Basin project area. Grazing reduces light herbaceous fuels and lowers fire probability and fire severity, but can also reduce the potential for a prescription burn to carry and accomplish management objectives.

Wildlife

In conjunction with past, present, and foreseeable future management activities, the following cumulative effects are predicted to occur:

Mexican spotted owl: The Mexican spotted owl is a high seral stage indicator of mixed conifer and high elevation riparian.

The action alternatives would have insignificant and discountable cumulative effects to Mexican spotted owl potential nesting, roosting, foraging, wintering, migration, and dispersal habitat in the near term. With the exception of Alternative 5, restricted habitat and stands that have been designated to be managed toward target/threshold condition would be silviculturally treated in accordance with the Mexican spotted owl Recovery Plan. Alternative 5 would have adverse effects to Mexican spotted owl potential nesting, roosting, foraging, wintering, migration, and dispersal habitat in the near term. Projects similar to this alternative that would not be in compliance with the Recovery Plan would not be implemented.

Over time, the cumulative effects would be positive as the risk of degradation or elimination of habitat due to catastrophic wildfires would decrease.

These vegetation treatments would maintain and create owl habitat where appropriate and provide a diversity of stand conditions and sizes.

Management-ignited fires following vegetation management projects, as well as management-ignited fires elsewhere in the watershed, would have negligible effects on potential nesting, roosting, wintering, migration, and dispersal habitat as loss of trees would be minimal. Any prescribed fires in Protected Activity Centers would be conducted in accordance with the Recovery Plan. Foraging habitat may be temporarily affected through modification of prey species habitat. The modification would likely occur due to the consumption of some snags, downed logs, and other woody debris. Managed fires should, in the long-term, increase prey species diversity and abundance.

Over time, the cumulative effects would be positive as target/threshold conditions in selected stands would be reached sooner than taking no action, restricted habitat would be maintained, improved, or restored, and the risk of degradation or elimination of habitat due to catastrophic wildfire would decrease.

The cumulative effects of all alternatives would not result in a detectable effect on the population trends of Mexican spotted owls in the Gila National Forest.

Loach minnow, Spikedace, Longfin dace, Speckled dace, Desert sucker, Sonora sucker, Chiricahua leopard frog, Arizona southwestern toad, Narrow-headed garter snake: (Sonora and Desert suckers are low seral stage indicators of low/mid/high elevation riparian.)

The Sheep Basin, Apache Forest Health, and Six Shooter/Black Deer Projects adjoin each other in the western portion of the watershed and drain into Negrito Creek by way of ephemeral drainages. Occupied loach minnow critical habitat is located at least 7.0 miles downstream from these ephemeral drainages and unoccupied spikedace critical habitat occurs at least 12.0 miles downstream. The longfin dace, speckled dace, desert sucker, Arizona southwestern toad, and narrow-headed garter snake occur in Negrito Creek. The Chiricahua leopard frog occurs in the South Fork of Negrito Creek but has not been documented in mainstem Negrito Creek.

Alternatives 2, 3, 4, 5, and 6: Existing conditions such as inherently stable soils, no perennial flow in the project area, no mechanical treatment of vegetation in ephemeral drainages, and a history of fire in the area would help minimize effects to downstream riparian and aquatic habitat. Best Management Practices (BMPs) would be implemented in action alternatives for all three projects to

mitigate accelerated soil erosion, soil compaction, off-site soil loss, and off-site herbicide transport. There would be short-term cumulative impacts to aquatic species if the three vegetation management projects were implemented simultaneously. This scenario is unlikely to occur due to the projected 5-10 year period to complete the two larger projects.

In the long-term, all action alternatives for the Sheep Basin, Apache Forest Health, and Six Shooter/Black Deer Projects, as well as implementation of other management-ignited fire projects in the watershed would have positive cumulative impacts to the watershed and downstream riparian and aquatic habitat. There would be fewer trees competing for light, soil moisture and nutrients, herbaceous ground cover would increase, the miles of open roads would decrease, and there would be an overall reduced risk of catastrophic wildfires. The cumulative effects of all projects would not result in a detectable effect on the population trends of these species in the Gila National Forest.

Northern goshawk: The action alternatives, and other proposed vegetation management projects manage in varying degrees towards more acreage of moderate and high seral condition ponderosa pine and an improved age class distribution. Alternatives 2 and 5 would harvest some large, yellow bark pines although this older age class would likely not be harvested in the other proposed projects. The action alternatives would have negligible cumulative effects to northern goshawk potential nesting, roosting, and foraging habitat in the near term.

Over time, the cumulative effects would be positive as the desired mature and overmature vegetation structural stages would be reached sooner than taking no action, goshawk habitat would be maintained, improved, or restored, and the risk of degradation or elimination of habitat due to catastrophic wildfires would decrease.

American peregrine falcon: The action alternatives would have no effect on nesting habitat due to lack of management activities in close proximity, and would have negligible cumulative effects to peregrine falcon foraging habitat in the near term. Over time, the cumulative effects would be positive as the acreage of mature and overmature stands would be increased sooner than taking no action, foraging habitat would be maintained, improved, or restored, and the risk of degradation or elimination of habitat due to catastrophic wildfires would decrease.

Flammulated owl: The action alternatives would have negligible cumulative effects to flammulated owl potential nesting, roosting, and foraging habitat in the near term. Alternatives 2 and 5 would harvest some large, yellow bark pines although this older age class would likely not be harvested in the other proposed projects. Over time, the cumulative effects would be positive as the acreage of mature and overmature trees used by this species would be increased sooner than taking no action. Potential habitat would be maintained, improved, or restored, and the risk of degradation or elimination of habitat due to catastrophic wildfires would decrease.

Ferruginous hawk: The action alternatives would have negligible cumulative effects to ferruginous hawk potential tree nesting and prey habitat in the short-term. Over time, the cumulative effects to habitat would be positive as grasslands are maintained, improved, or restored across the watershed.

Gray vireo: The action alternatives would have negligible short-term cumulative effects to gray vireos due to the opening of the woodland canopy that would alter the current condition of the habitat. Over time, the cumulative effects to the gray vireo and its habitat would be positive as the

preferred habitat of open woodlands would be attained. The risk of degradation or elimination of woodland habitat due to catastrophic wildfires would decrease.

Loggerhead shrike: The action alternatives would have negligible cumulative effects to individual loggerhead shrikes due to the opening of the ponderosa pine canopy that would alter the current condition of the habitat in the short-term. Over time, the cumulative effects would be positive as the preferred habitat of open ponderosa pine stands and open grasslands would be attained. The risk of degradation or elimination of ponderosa pine habitat due to catastrophic wildfires would decrease.

Occult little brown bat, Spotted bat, Fringed bat, Long-legged myotis, Long-eared myotis, Western small-footed myotis, Allen's lappet-browed bat, and Townsend's big-eared bat: The action alternatives would have negligible cumulative effects to potential bat habitat in the near term. Alternatives 2 and 5 would harvest some large, yellow bark pines although this older age class would likely not be harvested in the other proposed projects.

Over time, the cumulative effects would be positive as the acreage of mature and overmature trees preferred by these species would be increased sooner than taking no action, habitat would be maintained, improved, or restored, and the risk of degradation or elimination of habitat due to catastrophic wildfires would decrease.

Gila groundsel, Mogollon clover, and Grama grass cactus: The action alternatives would have negligible cumulative effects to potential Gila groundsel, Mogollon clover, and grama grass cactus habitat in the near term. Alternatives 2 and 5, with herbicide use, could potentially cause mortality of individual plants but herbicide use would not occur in other planned activities in the watershed. Implementation of either of these alternatives would have negligible cumulative effects to these species in the near term. Over time, the cumulative effects of all action alternatives would be positive, as the risk of degradation of habitat due to catastrophic wildfires would decrease.

Management Indicator Species

Rocky Mountain elk are moderate seral stage indicators of grasslands, woodlands, ponderosa pine, and mixed conifer stands. The action alternatives would not cumulatively result in substantial changes in the acreage of existing vegetation seral stages. There would be a cumulative increase in foraging habitat with a corresponding decrease in thermal and hiding cover. The cumulative effects would be positive, as there would be an overall improvement in Rocky Mountain elk habitat. The cumulative actions would not have a detectable effect on the population trends of Rocky Mountain elk in the Gila National Forest.

Mule deer are moderate seral stage indicators of piñon-juniper woodlands, oak woodlands; and moderate to high seral stage indicators of desert shrub, shrub woodland. The action alternatives would not cumulatively result in substantial changes in the acreage of existing piñon/juniper woodland and oak woodland moderate seral stage habitat. There would be a cumulative increase in the amount of browsing and foraging habitat with a corresponding decrease in thermal and hiding cover. The cumulative effects would be positive, as there would be an overall improvement in mule deer habitat. The cumulative actions would not have a detectable effect on the population trends of mule deer in the Gila National Forest.

Mexican spotted owl - (See previous Mexican spotted owl analyses.)

Merriam's wild turkey are moderate seral stage indicators of woodlands, mixed conifer forest, mid to high elevation riparian, and a moderate to high seral stage indicator of ponderosa pine forests. The action alternatives would cumulatively result in an increase in the acreage of moderate to high seral stage ponderosa pine and moderate seral stage pinyon-juniper in the watershed. There would be a loss of some potential roost trees but an increase in the acreage of created openings in the forest canopy.

There would be an increase in herbaceous biomass that would improve habitat quality for both poults and adults. The cumulative effects would be positive, as there would be an overall improvement in Merriam's wild turkey habitat. The cumulative actions would not have a detectable effect on the population trends of Merriam's wild turkey in the Gila National Forest.

Common [northern] flickers are high seral stage indicators of piñon-juniper woodlands and oak woodlands. The action alternatives would cumulatively increase the acreage of high seral stage pinyon-juniper habitat, as pinyon-juniper woodlands would be thinned leaving the largest available trees. The cumulative effects would be positive, as there would be an overall improvement in northern flicker habitat. The cumulative actions would not have a detectable effect on the population trends of northern flickers in the Gila National Forest.

Hairy woodpeckers are high seral stage indicators of ponderosa pine and mixed conifer forest.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of catastrophic wildfire would increase. Catastrophic wildfire in the watershed would result in more snag habitat that would be beneficial to hairy woodpeckers.

The action alternatives would have negligible cumulative effects to hairy woodpecker habitat in the near term. Over time, the cumulative effects would be positive as the acreage of mature and overmature trees preferred by this species would be increased sooner than taking no action. The cumulative actions would not have a detectable effect on the population trends of hairy woodpeckers in the Gila National Forest.

Long-tailed voles are low seral stage indicators of ponderosa pine and mixed conifer forest.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of catastrophic wildfire would increase. Catastrophic fire in the watershed would result in more low seral stage ponderosa pine and mixed conifer habitat that may be beneficial to the long-tailed vole.

The action alternatives would have positive cumulative effects to long-tailed vole habitat in both the near term and over time as low seral stage ponderosa pine habitat would be created. The cumulative actions would not have a detectable effect on the population trends of long-tailed voles in the Gila National Forest.

Mexican [Mogollon] voles are low seral stage indicators of high elevation riparian and primary high seral stage indicators of wet meadows. Riparian habitat occurs downstream of proposed management projects and wet meadows occur in the watershed.

The action alternatives would have positive cumulative effects to Mexican vole habitat in both the near term and over time. Although not an indicator of grassy open places and created openings in ponderosa pine forests, Mexican voles also inhabit these areas. Vegetation management projects would create openings in a mosaic pattern in the forest canopy. The cumulative actions would not have a detectable effect on the population trends of Mexican voles in the Gila National Forest.

Abert's squirrels are moderate to high seral stage indicators of ponderosa pine forests. Proposed vegetation management projects manage, in varying degrees, towards more acreage of moderate and high seral condition ponderosa pine. The action alternatives would have negligible cumulative effects to Abert's squirrel habitat in the near term.

Over time, the cumulative effects would be positive as the acreage of mature and overmature trees used by this species would be increased sooner than taking no action. The cumulative actions would not have a detectable effect on the population trends of Abert's squirrel habitat in the Gila National Forest.

Black-tailed jackrabbits are low seral stage indicators of desert shrub, plains grassland, piñon-juniper woodlands, and oak woodlands. The action alternatives would cumulatively reduce the acreage of low seral stage piñon-juniper habitat, as these woodlands would be thinned leaving most of the largest available trees. As the black-tailed jackrabbit is a habitat generalist, there would be an increase in the amount of open-canopied moderate and high seral stage piñon - juniper habitat. Oak woodlands would not be silviculturally treated. Removal of encroachment conifers from grasslands would cumulatively increase the acreage of this habitat type.

The cumulative effects would be positive, as there would be an overall increase in black-tailed jackrabbit habitat. The cumulative actions would not have a detectable effect on the population trends of black-tailed jackrabbits in the Gila National Forest.

Mearns' (Montezuma) quail are moderate to high seral stage indicators of piñon-juniper woodlands, and high seral stage indicator of plains grassland, mountain grassland, and oak woodlands. The action alternatives would have negligible cumulative effects to Mearns' quail, as the opening of the woodland canopy would alter the current condition of the habitat in the short-term. Over time, the cumulative effects to Mearns' quail and its habitat would be positive as the grasslands would marginally increase and an increased acreage of moderate and high seral stage piñon-juniper woodland would be attained. The cumulative actions would not have a detectable effect on the population trends of Mearns' quail in the Gila National Forest.

Horned larks are low seral stage indicators of plains and mountain grasslands. Removal of encroachment conifers from grasslands would cumulatively increase the acreage of this habitat type. The action alternatives would have negligible cumulative effects to horned larks and their habitat in the short-term. Over time, the cumulative effects to habitat would be positive as grassland restoration occurs across the watershed. The cumulative actions would not have a detectable effect on the population trends of horned larks in the Gila National Forest.

Plain (Juniper) titmice are high seral stage indicators of piñon-juniper woodlands, and moderate seral stage indicator of shrub woodland. The action alternatives would have negligible cumulative effects to plain titmice in the short-term due to the alteration of current habitat. Over time, the cumulative effects to the plain titmouse and its habitat would be positive, as more acreage of high

seral stage piñon-juniper woodlands would be attained. The cumulative actions would not result in a detectable effect on the population trends of juniper titmice in the Gila National Forest.

Sonora sucker and desert sucker - (See previous Sonora sucker and desert sucker analyses.)

Migratory Birds

Migratory bird habitat types, for those species documented in the Sheep Basin Project, range from open- to closed-canopied ponderosa pine stands, moderately- to closed-canopied pinyon-juniper woodlands, and mountain grasslands. These and other habitat types occur within the Negrito 5th code watershed and the Six Shooter/Black Deer Projects. Pinyon-juniper woodlands and grasslands do not occur in the Apache Forest Health Project. Riparian habitat occurs downstream of all three projects.

Uneven-aged silvicultural treatments would be implemented in these three projects. Uneven-aged management would maintain a specific tree-diameter distribution and therefore, there would be less change in stand structure and bird communities than under even-aged management. Stands selectively harvested not only retain much of the mature forest-bird community, but also provide habitat for some species that use the ground-shrub-sapling layer (Martin and Finch, 1995).

Pinyon-juniper woodlands would be treated and result in a semblance of the open woodlands that historically occurred. The removal of conifers from grasslands would have positive cumulative effects on migratory birds associated with this habitat type.

Management ignited fire would be used to remove excess slash. Slash would be lopped to a two-foot height to reduce flame height and scattered prior to prescribed burns for all three timber management projects. These prescribed burns as well as other management-ignited fires, and prescribed natural fires in the watershed are unlikely to occur simultaneously. Burn intensities should be low to moderate with minimal loss of larger trees.

Alternative 1 (no action) would continue existing environmental conditions and trends and the risk of degradation or elimination of most migratory bird habitat due to catastrophic wildfires would increase.

Alternatives 2, 3, 4, 5, and 6 - Whichever alternative is chosen, the cumulative effects would be positive for some migratory birds, and negative for others in either the short- or long-term.

Over time, the cumulative effects would be positive as habitat diversity would be increased and the risk of degradation or elimination of habitat due to catastrophic wildfires would decrease.

Watershed, Soils, and Air

A detailed analysis for watershed, soils, and air effects (Project Record 121) has been completed and has been summarized and incorporated into the following discussion.

The Negrito Creek Fifth code watershed is approximately 128,000 acres in size. The Sheep Basin Project area is approximately 6,143 (Alt. 2, 3, 4, and 6) or 15,400 (Alt. 5) acres in size and represents approximately 5% (Alt. 2, 3, 4, and 6) or 12% (Alt. 5) of the watershed. Over the past 30 years approximately 28,000 acres or 22% of the watershed has been treated by mechanical

harvest. Within the project area for all alternatives only 203 acres (less than 1%) have been thinned or harvested in the past 30 years, and this project has been approved but no work has been done on the ground. The Black Deer\Sixshooter Vegetation Management project is planned for implementation in 2003, this project will treat up to 12,400 acres with similar methods as in the Sheep Basin Project, approximately 6000 may be treated with some form of thinning treatment. After the completion of both projects a total of 32% of the watershed will have been treated. However the time span of the treatments (30 yrs) and the low intensity of timber harvest, the watershed will experience minimal cumulative effects from this treatment and past activities.

The area proposed to have trees cut and/or harvested is approximately 3,840 (Alt 2,3, 4, and 6) or 5,750 (Alt.5) acres in size and represents approximately 3% (Alt 2,3, 4, and 6) or 5% (Alt.5) of the watershed. If any of the action alternatives for the project is implemented over a 5-10 year period, it could have a small short-term negative impact to the watershed. There will be some reduction in ground cover from timber harvest, treatment of pinyon-juniper, and from prescribed burning. Overall from a long-term aspect, the project should have a positive impact to the watershed. The watershed conditions should improve with fewer trees competing for light, soil moisture and nutrients, fewer miles of roads open, and the area having a reduced risk of catastrophic fires due to the reduction in fuel loadings.

The Negrito Creek watershed is not affected by other watersheds above it due to it being in the headwaters of Negrito Creek and no other watershed drains into it. Grazing by livestock is occurring over much of the watershed. All of the allotments have or will go through a Range NEPA process to analyze grazing on the allotment. A forage utilization rate for each allotment has been set and is being monitored. This should improve the grazing uses on the allotments and improve the watershed conditions. The Corner Mountain allotment presently has no cattle on it. The allotment is designated as a swing allotment. Elk impacts are occurring throughout the watershed and have been recognized as an impact to the resources. The State Game and Fish has started to issue more elk permits for the area. This may help bring the elk numbers down and reduce the resource impacts. Most of the Negrito Creek watershed is in satisfactory condition as determined by the Terrestrial Ecosystem Survey.

Portions of the watershed have been or will to be treated with Management Ignited Burns (Table 5). These burns have or will reduce the fuel loadings and reduce the risk of hot wildfires. About 6000 acres in the Sheep Basin unit and 3000 in the Frisco Plaza unit have been burned in the last 15 years, primarily in the early 1990s. However, tree density and fuel loadings are increasing. There is a need to reduce tree density in order to improve vegetative ground cover in the understory and reduce the fuel loadings, which will then reduce the risk of high intensity fires. If this is properly done and the fire intensities are low to moderate and if the areas are treated over several years, the impacts to the watershed should be positive. If there are large contiguous blocks of hot fire intensities, this will cause a negative effect to the watershed.

There will be some short-term effects to the air quality of the area from prescribed burning. A burn permit will be obtained from the state and the prescriptions in the permit will be followed. The smoke from the prescribed burning will contribute to the regional air quality haze of the area. There will be a short-term effect to air quality from dust and exhaust.

Through the Negrito Ecosystem Analysis Report and the Range NEPA process on the allotments, the management and use on the riparian areas should improve. Presently, Negrito Creek (Tularosa Creek to the confluence of the North and South Forks) below the Sheep Basin Project Area is in

non-supporting status for high quality coldwater fishery for temperature. Water quality and sedimentation into the stream are important to the survival of aquatic species and watershed functions. By improving the riparian conditions through improved management, this should reduce the cumulative effects of the multiple uses of the watershed and improve the shading of the water and lower the temperatures. Most of the riparian areas in the watershed are known to be in unsatisfactory condition.

Alternative 1: This is the No Action Alternative. There would be no direct impacts to the watershed from the project and on going activities would continue. The following indirect impacts would occur. Tree densities would continue to increase and the vegetative growth in the understory would continue to decline. The vegetative ground cover would decline. Roads needing to be closed or decommissioned would not be treated. Fuel loadings would continue to increase. There would be an increased risk of a hot wild fire, which could affect the watershed, soils, and air. Overall, with no treatments in the project area the long-term the watershed and soils condition will decline, water runoff will become flashier, and there will be a decline in water quality. Air quality will not be impacted due to burning or harvesting with this alternative. Air quality could be impacted if there is a catastrophic fire.

Alternatives 2-6: If one of the action alternatives for the project is implemented over a 5-10 year period, it could have a small short-term negative impact to the watershed. There would be some reduction in ground cover from timber harvest, treatment of pinyon-juniper, and from prescribed burning. Overall from a long-term aspect, the project should have a positive impact to the watershed. The watershed conditions should improve with fewer trees competing for light, soil moisture and nutrients, fewer miles of roads open, and the area having less risk of catastrophic fires due to the reduction in fuel loadings. There would be some short-term effects to the air quality of the area from prescribed burning. A burn permit would be obtained from the state and the prescriptions in the permit would be followed. The smoke from the prescribed burning would contribute to the regional air quality haze of the area. There would be a short-term effect to air quality from dust and exhaust.

Overall, from a short-term perspective, Alternative 1 would have the lowest impacts to soils, watershed and air conditions assuming that a catastrophic wildfire does not occur, followed by Alternative 6, Alternative 4, Alternative 3, Alternative 2 and then Alternative 5. From a long-term perspective, Alternative 5 would have the most improvement to the soils, watershed, and air conditions followed by Alternative 2, Alternative 3, Alternative 4, Alternative 6, and then Alternative 1.

Range Resources

Alternative 1: The Sheep Basin Project Area is located within the Negrito/Yeguas grazing allotment and consists of about 13% of this allotment. The current authorized grazing plan for the Negrito/Yeguas Allotment is 6707 animal unit months for 12 months in a rest rotation program year-round on approximately 54,086 acres. If Alternative 1, or no action, were taken the cumulative effect would be increased pressure on herbaceous plant species within the Sign Camp, Olla, and Sheep Basin Pastures that are located in Sheep Basin unit. This increased pressure would lead to the long term need to utilize the other pastures more heavily within the Negrito Allotment to meet the needs of the current grazing management plan, or to reduce the allowable Animal Unit Months on the Negrito/Yeguas allotment by the year 2020. In 1988, 2,430 acres were burned to reduce fuels loading (Apache Burn), this burn helped to free up resources for

herbaceous species. However, since there was limited opening of the canopy associated with this understory burn, the effects were short lived, and no longer have a measurable effect on the forage production in the area. In 1997, the Apache Forest Health Project was initiated although the unit has not been harvested. When implemented openings would be established in the canopy and forage production would be increased. However, this area covers only about 203 acres. In 1995, 3,500 acres in the Sheep Basin unit were burned to reduce fuel loading associated with a thinning project. In this case the timber sale was not located in the project area, so minimal canopy was opened up to free resources for herbaceous growth. The effect from the burn is minimal. However, in the adjoining units (Rainy and Six Shooter/Black Deer) where trees were thinned and the canopy was opened, the herbaceous growth has increased providing more forage for wildlife and livestock.

There are a few projects associated with the Sheep Basin project that may have a cumulative effect in the Negrito Watershed. Three large projects are underway to reduce fuels loading in the Negrito Watershed. The Eckleberger burn project, started in 2001, is ongoing and is planned to treat 18601 acres in the Elk unit. Planning for the Milligan burn project was started in 2001 and is in progress. The project is planned to treat 18764 acres in the Milligan unit over the next two to three years. Planning for the Collins Park burn project was started in 2001 and is in progress. It is planned to treat 10449 acres in the Burro unit in the next two to three years. On the ground treatment has not begun with either the Milligan or Collins Park projects. Again the effects of fuels reduction without an associated opening of the tree canopy would be minimal. These understory burns could increase the health and vigor of the herbaceous species, with an associated rest from grazing pressure, that are already established, but the chance of new plants establishing and spreading is limited. The short-term effect would be to increase forage availability for the wildlife and livestock. This increased forage would potentially allow for decreased use in timing and intensity for the pastures located in the Sheep Basin unit, after the initial rest from livestock in the treatment areas. Another project that would potentially have a cumulative effect in the Negrito Watershed is the proposed 12,400-acre Black Deer/Six Shooter Vegetation Management Project. This project is a combination of thinning and fuels reduction burning. The short-term effect of this project would be an increased pressure from livestock on the pastures in the Sheep Basin unit. However, the long-term effect would be to decrease the pressures associated with livestock grazing and wildlife use because of the increased forage that would be available in the Six Shooter and Black Deer units.

Alternative 1 also includes the Frisco unit of the Negrito Watershed, which includes segments of the Eagle Peak, Frisco Plaza, and McCarty Allotments. The Frisco unit includes approximately 11% of the Frisco Plaza Allotment, which is currently authorized to run 1,385 animal unit months across 12 months. The Frisco unit also includes approximately 5% of the Eagle Peak Allotment, which is currently authorized to run 1,270 animal unit months across 5.5 months. In 1992, 2,922 acres were burned to reduce fuels loading (Frisco Plaza Burn), this burn helped to free up resources for herbaceous species. However, since there was limited opening of the canopy associated with this under-story burn the effects were short lived, and have no measurable long-term effect on the forage production in the area.

If Alternative 1 were taken the cumulative affect would be an overall decrease in forage production across the Frisco and Sheep Basin units within the Negrito ecosystem. The fuels reduction projects cleared understory growth, and may have freed resources for herbaceous growth; however, this is a limited benefit to the herbaceous species because the canopy is still closed.

Cumulative Effects Common to Alternatives 2-6

Broadcast burn (areas outside of cutting units): Herbaceous production would be sensitive to grazing pressures the initial growing season after the burn. If the burned area is not rested from livestock grazing pressures it could be detrimental to the health and vigor of the more palatable herbaceous plants in the community. Grazing wildlife would continue to be a pressure on these plants because of their tenderness and high protein content, and if high concentrations congregated in the area for an extended period of time during the initial growing season the health and vigor of the plants would be at risk. The broadcast burning would bring a moderate-term increase in the herbaceous plant community production and health after the first growing season, which would decrease the grazing pressures from livestock and grazing wildlife. However this benefit would be relatively short lived, and negligible by year 2020 because no long-term resources are opened up in this treatment.

Slash (lop/scatter areas within cutting units): This treatment would open up resources in the plant community for the herbaceous component. The projected increased production of the herbaceous species in the community would decrease pressures by grazing ungulates (wild and domesticated) because of the increased available forage. The process of lop and scatter would also create safe sites under the branches for more herbaceous species to establish without pressure from grazing ungulates. These pockets of protected plants would create a seed source for the surrounding area. Also, the nutrients from the needles (specifically nitrogen) would in time become available for the herbaceous species that are often limited in this region by nitrogen. After the area is burned the herbaceous plant community can have a strong surge because of the release of large amounts of nutrients and the clearing off of woody decadent material in the grass plants that tend to inhibit growth within an individual plant. The increased production can be maintained with the diminished woody component. After the area is burned it would be rested from livestock grazing for at least one growing season.

This type of treatment has proven to increase herbaceous production long term, and would create more of a forage base for wildlife and livestock. This increased forage base would decrease the pressures on the surrounding elk habitat and pastures in the Negrito/Yeguas Allotment.

Broadcast Burn - Slash pile and burn (areas within cutting units): The cumulative effects from burning the slash piles would be minimal because of the small area treated. Depending on the temperature of the piles a pocket of green herbaceous species may develop; if the fire is hot a bare spot may occur under the pile. In either case the effect on the grazing pressure in the surrounding areas would be negligible.

Pinyon-Juniper Woodland Treatments: The cumulative effect for opening up the canopy in the pinyon/juniper woodlands would be to decrease the pressures from grazing animals on the herbaceous community associated with this treatment. Specifically the pressures from the elk and the livestock would diminish on a community basis within the pasture for the livestock, and the immediate area for the elk. This in turn would decrease pressures from livestock grazing with the associated pastures in the Negrito/Yeguas Allotment. The benefit from this treatment would still be measurable in the year 2020.

Ponderosa Pine Treatments: The cumulative effects for the ponderosa pine treatment would be similar to those mentioned in the pinyon/juniper woodland treatment. The grazing pressures on

the herbaceous community would be diminished as the canopy opens up allowing for a larger healthier herbaceous community. Again the effects would still be measurable in the year 2020.

Herbicide Treatment: The cumulative effects for treating the re-sprouting juniper would be to prolong the health and vigor of the herbaceous community that would otherwise eventually be shaded and out-competed by the re-sprouting juniper.

Road Maintenance and Decommissioning: The cumulative effect of closing and decommissioning roads would have a negligible cumulative effect on the grazing pressures in the treatment area and the surrounding areas. The area is such a small component that a measurable cumulative effect would be unlikely.

Alternative 2: With the overall projected herbaceous increase of 30%, the associated pressures from livestock grazing would decrease in the Sheep Basin Project area, which would also decrease the pressures on the surrounding pastures within the Negrito/Yeguas Allotment.

Considering all of the aspects of this treatment option and the projected 30% increase in herbaceous production, in the treatment area, by the year 2020 the cumulative effects would be an overall decrease in grazing pressures in the treatment area and the Negrito/Yeguas Allotment as well as the surrounding wildlife habitat. This treatment program would allow for the greater dispersal of livestock grazing within the Negrito/Yeguas Allotment, and reduce the pressure placed on palatable herbaceous species within the allotment. The 1988 fuels reduction treatment in the Sheep Basin unit no longer has a residual effect regarding the herbaceous component of the plant community. The projects mentioned in Alternative 1 that may have a cumulative effect on the Sheep Basin unit may also have an effect under this treatment, specifically to enhance the increased forage production across the Negrito Watershed and reduce the pressures from livestock and wildlife.

Alternative 3: The cumulative effects for alternative three would not be measurably different from alternative two. The projected increase of 28% is not much different from the projected 30% increase in alternative 2. However, with the alligator juniper being grubbed instead of treated with herbicide the longevity of that aspect of the treatment may not be as long. This would essentially shorten the time until the site returned to pre-treatment conditions in the area affected by the juniper control measures.

Alternative 4: The cumulative effects associated with alternative 4 would be essentially the same as Alternative 2. However, with less area being treated in the ponderosa pine stands and the associated diminished herbaceous production there would be a slightly less reprieve for the herbaceous community. The difference is minor though, and a measurable difference from the cumulative effects associated with Alternative 2 would not be likely.

Alternative 5: The cumulative effects associated with Alternative 5 would simply be magnified in the long run in respect to those proposed for Alternative 2. This is simply because of the large increase in area being treated in the ponderosa pine stands as well as the pinyon/juniper stands. With the projected 51% increase in the herbaceous plant community production across the Sheep Basin Project Area the grazing pressures in this area would dramatically be reduced from the livestock perspective, and would greatly increase the forage and cover available for the elk and other grazing wildlife species in the area. The 1988 and 1992 fuels reduction treatments in the

Sheep Basin and Frisco units no longer have residual effects regarding the herbaceous component of the plant community.

Alternative 6: The cumulative effects of Alternative 6 would not be different than the proposed cumulative effects listed for Alternative 2. The projected 30% increase in the herbaceous plant community is the same as that listed for Alternative 2 and would likely produce the same outcome.

Social and Economic Structure

The goal of ecosystem management is to restore and sustain the health and productivity of ecosystems through an ecological approach that is fully integrated with social and economic goals. The cumulative effect of the Sheep Basin project will be not only the improvement of ecosystem health but also the simultaneous improvement of socioeconomic well being by promoting economic development in local communities. This is the ultimate goal of ecosystem management.

The direct effects of the project will be increased employment and income for local residents. The indirect effects include: increased revenues to local businesses and increased community stability and improved social conditions in the socioeconomic impact area.

A small elk population, a short road, or a small fire is unlikely to have a significant effect on watershed condition (health). So it is with the Sheep Basin project and the health of the socioeconomic ecosystem. This project represents a good first step towards restoring the health of both the biophysical and socioeconomic systems. Achieving this goal is going to require the implementation of more projects like Sheep Basin over a long period of time.

Literature Cited

- Christy, Robin E.; Stephen D. West. 1993. Biology of bats in Douglas-fir forests. Gen. Tech. Rep. PNW-GTR-308. Portland, OR; U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, 28 p. (Huff, Mark H.; Holthausen, Richard M.; Aubry, Keith B., Tech. coords. Biology and management of old-growth forests).
- Davis, James, B., Ffolliott, Peter F., and Clary, Warren P. 1968. A fire prescription for consuming ponderosa pine duff. Res. Note RM-115. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 4pp.
- Dixon, C. and J. Knight. 1993. Mearn's Quail in New Mexico. New Mexico State University, College of Agriculture and Home Economics, Las Cruces, NM.
- Elzinga, C.L., D.W. Salzer, J. W. Willoughby, and J.P. Gibbs. 2001. Monitoring plant and animal populations. Blackwell Science Inc., Malden, MA.
- Harrington, M.G. 1981. Preliminary burning prescriptions for ponderosa pine fuel reduction in southeastern Arizona. Res. Note RM-402. Fort Collins CO: U.S. Department of Agriculture, Forest service, Rocky Mountain Forest and Range Experiment station. 7 pp
- Jameson, D.A. 1967. The relationship of tree overstory and herbaceous understory vegetation. Jour. Range Manage. 20:247:249.

Martin, T. and D. Finch. 1995. Ecology and management of neotropical migratory birds. Oxford University Press, New York, NY.

New Mexico Department of Game and Fish Long Range Plan for the Management of Wild Turkey in New Mexico 2001-2005

Propst, D.L. 2001. Systematic Investigations of Warmwater Fish Communities; FW-17-RD-28; 1 July 2000 – 30 June 2001. New Mexico Department of Game and Fish. Santa Fe, NM. 34 pp.

Sackett, Stephen S. 1980. Reducing natural ponderosa pine fuels using prescribed fire: Two case studies. Res. Note RM-392. Fort Collins CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 6.pp

Final Environmental Impact Statement for Amendment of Forest Plans. 1995. USDA Forest Service, Southwestern Region. Albuquerque, NM.

USDA. 1982. FSH 2209.21 - Range Analysis Handbook. Region IV, U.S. Forest Service, Ogden, Utah. 46 pp.

Zimmerman, D.A. 1995. Birds of the Gila National Forest: A checklist. U.S.D.A. Forest Service In cooperation with the Southwest New Mexico Audubon Society.

List of Agencies and Persons Consulted

Catron County Extension Agent	Mr. Eddie Chavez
Forest Guardians	Mr. Van Clothier
Guadalupe Mts. National Park	Ms. Wanda Conn
Hall Family Trust	Ernestine Conyers
Land & Water Resources	Ms. Caren Cowan
Maxall Corp	Mr. Deilly Crumbley
NM Cattlegrowers Assoc.	Ms. Mary Darling
NM Dept. of Agriculture	Mr. Richard Deubel
NM Environment Dept./SWQB	Mr. Frank A. Dubois
NRCS	Thomas & Barbara Duffy
Public Lands Action Network	Mr. / Mrs. Stephen Durkovich
Sierra SWCD	Mr. Bob Fisher
Silver City Public Library	Honorable Thomas P. Foy
SW Envir. Center	Ms. Suzanne Freeman
SWCD, San Francisco	Mr. Danny Fryar
Upper Gila Watershed Alliance	Mr. Jay E. Fuller
Forest Conservation Council	Mr. Fred Galley
New Mexico Wilderness Alliance	Mr. Joseph Gendron
National Forest Protection Alliance	Margie & Mike Gibson & Holloway
Flying W Ranch A.C.C.	Mr. Ralph Gooding
Outlaw Cattle Corporation	Mr. & Mrs. Sewell Goodwin
Catron County Commissioners	Mr. Mark Lane
Cooperative Extension Agency	Glenn & Sandra Griffin
Reserve Chamber of Commerce	Mr. Glyn Griffin
Sierra Club	Mr. & Mrs. Roland Ground
NM Environmental Law Center	Mr. John Hand
NM Cattlegrowers Association	Mr. Gary Harris
Energy, Minerals & Natural	Mr. Bill Hawkins
Resource Department	Ruby C. Hays
Forest Conservation Council	Honorable Manuel Herrera
Mr. Steve Anderson	Mr. James Hines
Mr. Ty Bays	Mr. J. T. Hollimon
Ms. Teresa Beall	Mr. Vernon Hollimon
Mr. Steve Benson	Mr. John Horning
Ms. Elaine Bernal	Mr. Corwin Hulsey
Mr. Tommy Bickle	Mr. Duston L. Hunt
Mr. Phil H. Bidegain	Mr. Lee H. Ingalls
Jim & Judy Blair	Mr. George Jackson, Jr.
Doug & Peggy Bogart	Mr. / Mrs. Charles Jenke
Mr. Wayne L. Bounds	Mr. / Mrs. R. C. Johnson
Sibyl S. Brown	Mr. Charles Judd
John R. & Linda Buchser	Mr. Bruce E. Keeler
Ms. Karen Budd-Falen	Mr. Harold C. Keith
Mr. Jeff Burgess	Conrad Jr. & Tywoulda Keyes
Ms. Leta Cain	Ms. Renee Kincanon

Mr. James V, Lewis
Ysabel & Paul Luecke
Ms. Lucille Lumpkin
Donald & Mary Lou Maness
Mr. Dick Manning
Charlie & Thelma McCarty
Mr. Glen McCarty
Mr. & Mrs. Michael McDermott
Mr. Theodore C. Mertig
Mr. & Mrs. Burnard Milligan
Mr. Joe Milligan
Mr. Bob Moore
Doug Neher
Mr. M. Edward Nesselroad
Mr. Jesse F. Owens
Ms. Kim Peters
Mr. Roger S. Pete
E. F. & Dorothy Pyle
S. J. & Jessie E. Quinney
Pedro G. Rael
Mr. Gilbert Reeves
Lamar & Glenna Reynolds
Mr. Michael Robinson
Larry & Melissa Rucker
Ms. Linda Rundell
Ms. Alysia Abbott
Mr. Brian Segee
Mr. Jimmy Serna
Mr. Steve Servis
Lena Shelhorn
Terrell & Charlene Shelley
Mr. Greg Short
Mr. Todd Shulke
Honorable Joseph R. Skeen
John & Ellen Snow
Salado Soil & Water
Mr. Kieran Suckling
Mr. & Mrs. Phillip W. Swapp
Ms. Marianne Thaeler
Ms. Rachel Thomas
F. Roberts Wantland
Mr. Frank Werber
Mr. Gary Whitehead
Mr. Jim Williams
Mr. David R. Winston
Ms. Elena Gelert
Mr. Don Weaver
Mr. Bryan Bird
Mr. Edward Sullivan

Mr. Jim Anderson
Mr. Sam Ray
Ms. Karen Haston
Mr. Ben Marlin
Mr. Jim Coates
Ms. Susan Shaw
Mr. Tony Davis
Mr. John Talberth
Roy L. Price
Darrell L. & Carolyn Julian
Myrna Christensen
Glen McCarty
Cindy Blakeslee
Molly Baxter
Josie Aragon
Edward & Christie Cope
Pedro Rael
Edward P. & Barbara Atwood
Danny & Jacqueline Fryar
Julio Cordova
Emil & Sons, Inc Kiehne
Gary Ritchey
Wayne Gardner
Gene Baca
Scott Yates
Fred Galley
Steven Dugan
Jim & Judy Blair
Sybil Griffin Brown
Don D. Jones
Preston Bates
Mr. Doug Boykin
Mr. Loren Panteah, Acting Director,
Zuni Heritage and Historic
Preservation Office
Mr. James Enote, Project Leader,
Zuni Conservation Project,
Pueblo of Zuni
Governor Malcolm Bowekaty, Pueblo
of Zuni
Mr. Anthony Otto Lucio,
Councilman, Office of the
Governor
Governor Lloyd D. Tortalita, Pueblo
of Acoma
Mr. Petuuche Gilbert, Pueblo of
Acoma
Mr. Ernest M. Vallo, Sr., Pueblo of
Acoma

Mrs. Ruey H. Darrow, Chairperson,
Fort Sill Apache Tribe
Mr. Michael Darrow, Tribal
Historian, Fort Sill Apache Tribe
Office of the President, The
Mescalero Apache Tribe
Ms. Holly B.E. Houghten, Tribal
Archaeologist, The Mescalero
Apache Tribe
Ms. Donna Stern-McFadden, Tribal
Historic Preservation Officer,
Mescalero Apache Tribe
Ms. Ellyn Bigrope, NAGPRA
Coordinator, The Mescalero
Apache Tribe
Mr. Ferrell Secakuku, The Hopi
Tribe
Mr. Wayne Taylor, Jr., Chairman,
The Hopi Tribe
Mr. Leigh J. Kuwanwisiwma,
Director, Cultural Preservation
Office, The Hopi Tribe
Mr. Raymond Stanley, President,
The San Carlos Apache Tribe
Ms. Jeanette Cassa, Coordinator,
The San Carlos Apache Tribe
Mr. Dallas Massey, Sr., Office of the
Chairperson, White Mountain
Apache Tribe
Kelsey Begaye, Office of the
President, Navajo Nation
Ms. Martha Garcia, Office of the
President, Ramah Navajo
Chapter
President, Alamo Navajo Chapter
Stephen McDonald

Appendix A

MAPS