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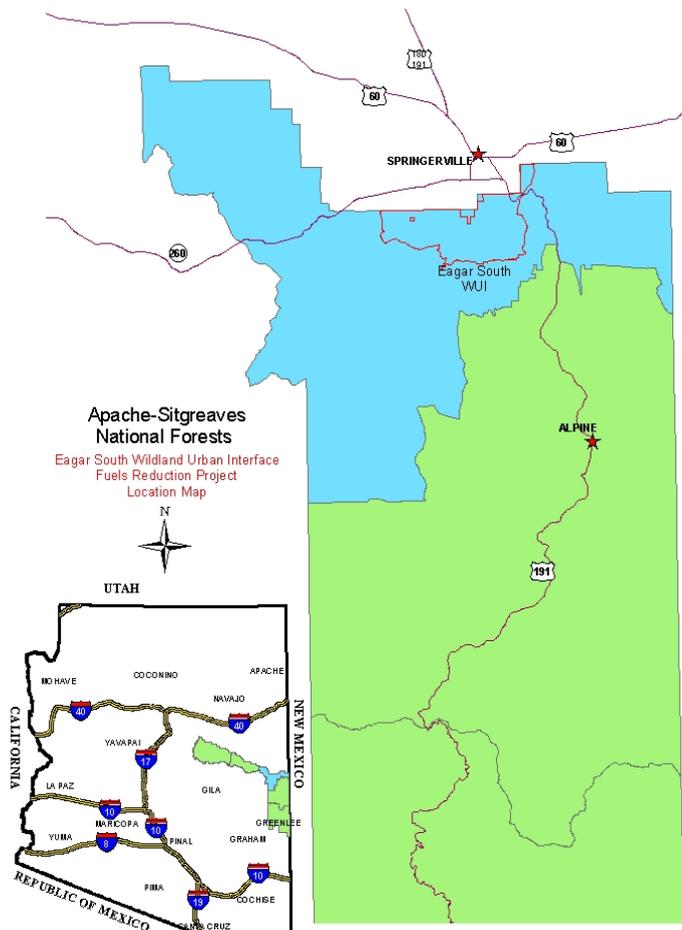
November  
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# Environmental Assessment

## Eagar South Wildland/Urban Interface Fuel Reduction Project

Springerville Ranger District, Apache-Sitgreaves National Forests  
Apache County, Arizona



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## INTRODUCTION

### Summary

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The Forest Supervisor for the Apache-Sitgreaves National Forests proposes to conduct fuel reduction treatments, including thinning and burning, on National Forest System lands adjacent to private and State lands within the Eagar South Wildland Urban Interface (WUI) near the community of Springerville / Eagar AZ, in Apache County. The Eagar South WUI area encompasses approximately 21,779 acres (see attached Project Map). This includes approx. 48 acres of private land in a single parcel, in the western portion of the analysis area. The project analysis area is located within the following USGS 7.5' quad maps: Eagar, Greer and Nelson Reservoir and is within the Springerville Ranger District, Apache-Sitgreaves National Forests.

The purpose of the proposal is to reduce the fire hazard potential in and around the communities of Eagar and Springerville. Reducing fire hazard risk is also intended to protect the municipal watershed of these communities from adverse effects of large-scale wildfire. The project is also expected to protect and enhance important wildlife species habitats and improve soil, watershed, riparian condition and the health of the vegetation on the area. Large-scale maps of proposed treatment areas are located in the Project File at the Springerville Ranger District office, Apache-Sitgreaves National Forests, Springerville, AZ. Appendix A contains a glossary of terms used in this document and in the Specialists' Reports that support the analysis.

### Background

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In December 2003, President Bush signed the Healthy Forest Restoration Act (HFRA), H.R. 1904<sup>1</sup>. The Act provides forest management professionals the ability to work with local landowners and the public at large in streamlining the implementation of the 2000 National Fire Plan<sup>2</sup> and in restoring the health of our nation's forests by employing preventative techniques aimed at reducing the hazardous fuels buildup in our forests and reducing the risk of fires to at-risk communities. In 2004, in response to the HFRA, Apache County developed the Apache Communities' Wildfire Protection Plan<sup>3</sup> (ACWPP), which includes the Eagar South Wildland Urban Interface. In March of 2004, the Town of Eagar requested analysis of the area and treatments begin as soon as possible. The request was made to provide protection to private property along the Forest/Town boundary and the municipal watershed from catastrophic fire.

Past management actions have contributed to a change in forest structure and species composition. Dense overstocked stands have replaced the once park like ponderosa pine stands and the more open pinyon-juniper stands. Surface fuel loadings vary anywhere from 5 tons/acre to over 25 tons/acre in the ponderosa pine and pinyon-juniper stands. Stand conditions in the ponderosa pine consist of interlocking crowns and ladder fuels resulting in increased crown fire potential. The pinyon juniper stands are relatively closed canopy overstories with a broken understory of brush and grass. Fire spreads through these stands under extreme conditions by torching and spotting. On September 28, 2004, John MacIvor,

District Ranger of the Springerville Ranger District signed the project initiation letter (Project Record #8) that identified the Interdisciplinary Team (IDT) and their responsibilities for the analysis of this project.

<sup>1</sup><http://fsweb.wo.fs.fed.us/hfra/references/fedreg36cfr218a.pdf>

<sup>2</sup><http://www.fireplan.gov/content/home>

<sup>3</sup><http://www.azstatefire.org>

## **Purpose and Need for Action**

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The purpose of the proposal is to reduce the fire hazard potential in and around the communities of Eagar and Springerville.

There is a need to reduce hazardous forest fuels on the analysis area, which will improve firefighting response capabilities and protect watersheds near the communities from adverse effects of large-scale wildfire.

## **Relationship to Policies and Plans**

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### **Consistency with the Forest Plan**

The Apache-Sitgreaves National Forests Land and Resource Management Plan (FLMP) was adopted in 1987. The plan assigns Management Areas (MAs) with particular goals, standards and guidelines (see Chapter 4 of the FLMP). The project area includes MA 01 (Forested Lands), MA 02 (Woodlands), MA 03 (Riparian Areas), and MA 04 (Grasslands).

Best Management Practices (BMPs) and design criteria were developed by the IDT to meet, or move the project area toward meeting the goals and objectives established in the FLMP. However, the Proposed Action departs from management direction of the FLMP, as amended in 1996 (USDA 1996, page 91), in the following circumstance:

- ▶ By not fully following the “Management Recommendations for the Northern Goshawk in the Southwestern United States” such that proposed density reductions may not meet the canopy cover requirements for Northern Goshawk in some treatment areas. Density reductions in Treatment Area 5 (approximately 20% of the area proposed for mechanical thinning) are not expected to meet canopy cover requirements. These density reductions are needed to reduce fire hazard potential on the area and provide protection to the watersheds from large scale, high intensity fires.

The decision document for the Proposed Action (if selected) would, therefore require a project-specific amendment to the FLMP to allow for this departure. This departure is necessary to meet the objectives of the Proposed Action adjacent to the at-risk community of Springerville / Eagar, AZ.

## Other Laws, Regulations and Policies

This project was designed consistent with all current laws, regulations and policies that apply to fuel reduction projects. The Fire / Fuels Specialist Report (Project Record #50) discusses the National Fire Plan and other national policies related to wildland fire and reducing fuel loading within the wildland-urban interface area (WUI).

## Public Involvement

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On August 17, 2001, Eagar, AZ was listed in the Federal Register as an Urban Wildland Interface Community within the vicinity of Federal Lands that are at high risk from wildfire. In 2004, Eagar and Springerville were listed as communities at risk in the ACWPP and development of this plan was in progress. The proposed project was listed in the Schedule of Proposed Actions in July of 2004. On March 16, 2005, agency personnel conducted a public meeting at the Eagar Town Hall to update the public on the status of the development of a proposed action. Comment forms were provided with a request for comments. On December 6, 2004, Arizona State Land Department, Natural Resource Conservation Service, U.S. Fish & Wildlife Service, Arizona Game & Fish Department, Town of Eagar, Town of Springerville and Apache County were invited to participate in the analysis for the project (Project Record #s 10-16). On April 13, 2005, a scoping report (Project Record #029) was mailed to 184 groups, organizations and individuals. The scoping report was also posted at the Springerville, Eagar, Greer, Nutrioso, Alpine, and Vernon Post Offices. In addition, as part of the public involvement process, an information flyer regarding the scoping report was posted at public establishments.

Eleven respondents commented on the scoping letter. The IDT evaluated all comments for applicability to the analysis, e.g., was the comment an issue and, if so, was it a key issue, a design issue, or an issue beyond the scope of the analysis. No key issues were identified during scoping.

## Decision Framework

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Given the purpose and need, the Forest Supervisor reviews the proposed action and the other alternatives in order to make the following decisions:

- ▶ Whether or not to proceed with the proposed action.
- ▶ Whether or not to modify the design criteria and Best Management Practices.
- ▶ Appropriate monitoring requirements to evaluate project implementation.
- ▶ Whether or not the project may have significant environmental effects that must be evaluated in a separate Environmental Impact Statement.

## ALTERNATIVES, INCLUDING THE PROPOSED ACTION

### Alternatives

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#### No Action

The No Action alternative would not implement any fuel reduction treatments on National Forest System (NFS) lands around the at-risk communities of Eagar and Springerville, AZ and adjacent private and State lands, except as part of other National Environmental Policy Act (NEPA) decisions. Under the No Action alternative, fuel loading on NFS lands adjacent to private and State lands would not be reduced. The risk of threat to human life, property or adverse effects on watershed and other resources because of a wildland fire event would not be reduced.

#### Proposed Action

The project area encompasses approximately 21,779 acres of National Forest System lands adjacent to and surrounding the communities of Eagar and Springerville. (See attached Project Map). The Proposed Action is a combination of treatments, on approximately 21,129 acres, to live trees, snags (dead standing trees), existing and pre-existing slash and herbaceous vegetation. Thinning and treatment of existing and created slash in forest and grasslands areas will occur on approximately 17,896 acres. Use of prescribed burning only for fuel reduction will occur on approximately 3,233 acres. Approximately 650 acres within the project analysis area do not have treatments proposed. The Proposed Action treatments are summarized in Table 1. These proposed treatments would be utilized as guidelines for developing stand-specific Silviculture prescriptions.

Table 1: Proposed Treatments

Treatment	Vegetation	Slash
<p><b>1</b></p> <p>PJ</p> <p>Slopes &lt;40%</p> <p>8,947 acres</p>	<p>Target crown spacing for conifers will be 20’-35’ between trees as needed to promote fire-resilient stands. All PnP &gt;12” drc, all juniper species &gt;16” drc, and all PP &gt; 16” dbh will be left unless removal is needed to promote a fire resilient stand. Species preference for leave trees in descending order is: PP, AJ, PnP, all other juniper species. Where feasible, strips up to 15 acres will be opened up to promote forb production for ungulate winter habitat. Areas may be treated with periodic prescribed burns.</p>	<p>Slash may be mechanically treated, lopped and scattered, piled, burned or used for soil stabilization. Boles &gt;3.9” dib. will be removed where feasible. All snags within 300’ of key fire control roads will be removed, beyond this conifer snags &lt;12” dbh will be removed.*</p>
<p><b>2</b></p> <p>PP, PJ or MC</p> <p>Slopes &gt;40% or Inaccessible</p> <p>3,233 acres</p>	<p>Areas may be treated with periodic prescribed burns.</p>	<p>Prescribed fire.</p>
<p><b>3</b></p> <p>PP</p> <p>Slopes &lt;40% within PAC</p> <p>102 acres</p>	<p>Follow Apache-Sitgreaves National Forests Plan standards and guidelines. In summary this will involve removing conifers &lt; 9” dbh. Areas may be treated with periodic prescribed burns.</p>	<p>Boles &gt;3.9” dib from the thinning will be removed from the project area. Created and residual slash will be mechanically treated, removed, piled, burned, or utilized for soil stabilization.</p>
<p><b>4</b></p> <p>PP</p> <p>Slopes &lt;40% within PFAs</p> <p>1,052 acres</p>	<p>Target BA for conifers in VSS 3 groups is 50. Target BA in VSS 4, 5, and 6 groups is 80. In areas less than 50 or 80 BA, respectively, conifers between 3’ tall and 4.9” dbh will be retained and spaced 20’-25’ from existing trees. Areas may be treated with periodic prescribed burns.</p>	<p>Boles &gt;3.9” dib from the thinning will be removed from the project area, where feasible. Created and residual slash will be mechanically treated, removed, piled, burned, or utilized for soil stabilization. All snags within 300’ of key fire control roads will be removed, beyond this conifer snags &lt;12” dbh will be removed.*</p>
<p><b>5</b></p> <p>PP</p> <p>Restoration presettlement</p> <p>Slopes &lt;40%</p> <p>3,559 acres</p>	<p>All PS trees will be retained; younger trees within competitive distances will be removed unless needed for restoration. R trees will be identified based on remnant evidence. A range of 1-6 R trees will be left to replace each remnant tree evidence. This will result in tree densities ranging from 25-280/acre. Only small areas will retain stocking levels of 280 trees/acre. Areas may be treated with periodic prescribed burns.</p>	<p>Boles &gt;3.9” dib from the thinning will be removed from the project area. Created and residual slash will be mechanically treated, removed, piled, burned, or utilized for soil stabilization. All snags within 300’ of key fire control roads will be removed, beyond this conifer snags &lt;12” dbh will be removed.*</p>

Treatment	Vegetation	Slash
<p><b>6</b></p> <p>Grasslands: Restore grasslands &amp; maintain openings</p> <p>Slopes &lt;40%</p> <p>4,169 acres</p>	<p>Grassland restoration is designed to promote and restore open grassland conditions. All PS trees will be retained. All other trees encroaching on meadows can be cut. Areas may be treated with periodic prescribed burns.</p>	<p>Slash may be mechanically treated, lopped and scattered, piled, burned or used for soil stabilization. Boles &gt;3.9”dib. will be removed where feasible.</p>
<p><b>7</b></p> <p>Riparian: Water Canyon</p> <p>67 acres</p>	<p>Understory thinning of PP, PnP and juniper to reduce coniferous species within the floodplain and channel of Water Canyon drainage. All PnP &gt;12” drc, all juniper species &gt;16” drc, and all PP &gt; 16” dbh will be untreated. Conifers that provide streambank stability would be maintained regardless of size.</p>	<p>Boles &gt;3.9” dib from the thinning will be removed from the project area, when feasible. Created and residual slash will be mechanically treated, piled, burned, utilized for soil stabilization and removed where feasible.</p>
<p><b>8</b></p> <p>Riparian: Springs/Seeps</p> <p>16 Sites</p> <p>Approx. 50 acres - included in portions of other treatment areas</p>	<p>Understory thinning of PP, PnP, and juniper to reduce coniferous species and restore riparian habitat. All PnP &gt;12” drc, all juniper species &gt;16” drc, and all PP &gt;16” dbh will be untreated.</p>	<p>Slash may be lopped, scattered, piled, burned, or mechanically treated and removed where feasible.</p>

Along with the treatments, re-occurring maintenance burns will be implemented.

\*Snag Retention and Recruitment: Snags will be managed to meet or exceed the Forest plan standard of at least 55% of the project area with at least 180 snags per 100 acres. Recruitment from the large diameter over-story will be used to exceed the Forest Plan Standards and Guidelines of snags per acre, thus the average number of snags per acre will, over time, meet or exceed the minimum requirement of snags per acre over the landscape.

**Total acres proposed for treatment = approximately 21,129 acres**

Definition of abbreviations – see attached Glossary

- |                                |                            |                                   |
|--------------------------------|----------------------------|-----------------------------------|
| AJ = alligator juniper         | drc = diameter root collar | PS = presettlement trees          |
| BA = basal area                | MC = mixed conifer         | R = replacement                   |
| dbh = diameter breast height   | PnP = pinyon pine          | VSS = vegetative structural stage |
| dib = diameter inside the bark | PP = ponderosa pine        |                                   |

## Other Alternatives Considered

An alternative that accomplished fuels reduction by prescribed burning only (no mechanical treatments) was briefly considered; however, the IDT determined that the objectives for the project would not be met, even minimally. This alternative was dropped from further detailed consideration. Fire and fuels modeling indicates the desired reduction in fire hazard risk would not occur with this alternative. (Fire / Fuels Specialist Report, Project Record # 50.)

## Mitigation Measures and Design Features

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Best Management Practices (BMPs) were developed by the IDT, specifically for the Proposed Action, to protect water quality, minimize adverse effects and meet Management Area Standards and Guidelines (Appendix B). BMPs were developed based on professional experience and field reconnaissance, Terrestrial Ecosystem Survey (TES) mapping unit properties, and limitations and suitability of various management practices. The White Mountain Stewardship contract, through which many of the proposed mechanical treatments would be accomplished, also has prescribed conservation practices as well.

The following mitigation measures to minimize resource impacts would be implemented with the treatments prescribed in the proposed action.

**Best Management Practices:** BMPs, as developed by the IDT shall be followed to mitigate ground-disturbing activities.

**Protection of Heritage Resources:** All archeological sites will be marked in an inconspicuous fashion, avoided by mechanized equipment, and closely monitored. If additional sites are discovered during project implementation, all work in that locale shall be halted and the Forest Archeologist will be notified. All known sites will be protected pursuant to FSM 2361.1(2) and FSM R-3 2362.21(2) until testing or additional information is available to allow for a formal determination of eligibility to the National Register of Historic Places.

**Timing Restrictions in Mexican Spotted Owl Protected Activity Centers (PAC):** No project related activities will occur within known Mexican Spotted Owl PACs during the breeding season (March 1-August 31) unless surveys determine the PAC is unoccupied, and then treatments may occur during the breeding season.

**Timing Restrictions in Goshawk Nesting Areas and Post-fledging Family Areas (PFA):** No project related activities will occur in active goshawk nesting areas or Post-fledging Family Areas during the nesting season (March 1- September 30) unless surveys determine the PFA is unoccupied, and then treatments may occur during the breeding season.

**Smoke Mitigation:** The Forest Service will monitor smoke produced during pile or broadcast burns. Arizona Department of Environmental Quality (ADEQ) BMP's will be followed. Smoke impacts to communities will be closely monitored.

**Additional Smoke and Fire Control Mitigation:** Broadcast burning blocks will be laid out using existing roads or skid trails and Forest Service constructed handline or draglines when deemed necessary. Control features (i.e. existing roads or created fireline) will be used to control the amount of burning accomplished each day. The

District will take measures to notify the public when the burning begins and the expected duration.

**Burning Plans:** Burn plans will be developed and designed to minimize high intensity fires and the possibility of escape.

**Visual Quality:** In proposed treatment areas along State Highway 261 and Forest Road 285 within Management area 1, within view of roadway, remove or dispose of slash within one year. In proposed treatment areas along State Highway 261 and Forest Road 285, within Management area 2 (Pinyon juniper), emphasize open stands of mature (12" dbh or larger) trees with a variety of other size classes. If other species occur in the stand naturally, such as oak, a representative population of these species should be retained. Treat created slash in these areas.

## Monitoring Plan

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For this project, monitoring would be conducted in accordance with the requirements outlined in the Apache-Sitgreaves National Forests Land and Resource Management Plan. Planned monitoring activities are displayed in Appendix C.

## Comparison of Alternatives

Table 2. Comparison of the No Action and Proposed Action alternatives.

Activities/Actions	No Action	Proposed Action
Acres Treated	None	Approximately 21,129 acres (97% of Project Area).
Mechanical Vegetation Treatments Note: Acres may also be prescribe burned	None	Commercial and Noncommercial thinning on approximately 17896 acres; (82% of Project Area).
Prescribed Burning Treatments Only	None	3,233 acres: (15% of Project Area)
Old Growth Acres Allocated By This Project	0 acres	3,522 acres; 20 % of the forested acres within the Project Area.
<u>Fire Regime Condition Class*</u> :	<u>Forested Area:</u>	<u>Forested Area:</u>
1	23%	77%
2	13%	20%
3	64%	3%
<u>Predicted Average Flame lengths</u> (Flamelengths < 4 feet indicate that suppression with engines and handcrews would likely be successful).	>4 feet	< 4 feet
<u>Torching Index **</u>	Moderate to High	Low
<u>Crowning Index ***</u>	Moderate to High	Low

\* Fire Regime Condition Class defines departure from a historic Fire Regime and resulting vegetative structure and composition. Condition class ranges from 1 to 3, from low to moderate to high

\*Torching Index (TI) is the wind speed required to move a surface fire into the crowns of trees and is calculated to determine crown fire potential. It is a measure of crown fire initiation. The TI index for this analysis is broken into three categories of risk: low, moderate, and high. Low hazard is wind speeds >50 mph, moderate hazard is wind speeds 25-50 mph, and high hazard is wind speed <25 mph needed to initiate crown fire (Cassidy).

\*\*The Crowning Index (CI) is based on twenty-foot wind speeds required to maintain an active crown fire. The denser or closer spacing of trees allows for fire to travel from tree to tree and on through the canopy. Stand density in the program is modeled through canopy bulk density. Components that determine the CI are crown bulk density, slope, and surface fuel moisture. CI indices are broken into three categories of risk: low, moderate, and high. Low risk is 50 mph or greater, moderate 25-50 mph, and high less than 25 mph (Cassidy).

## ENVIRONMENTAL CONSEQUENCES

This section describes the environmental impacts of the Proposed Action and No Action alternatives. The focus is on the significance of various environmental effects to determine whether to prepare an Environmental Impact Statement. Further analysis and conclusions about the potential effects are available in Resource Specialists' Reports and other supporting documentation cited below.

### Fire, Fuels and Air Quality

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This section summarizes the effects analysis described in the Fire / Fuels Specialist Report, Project Record # 50, and the Air Quality section of the Watershed Specialist Report Project Record # 40. The Forest Vegetation Simulator (FVS) along with The Fire and Fuels Extension (FFE) was used to model the alternatives due to its many applications for fire and stand dynamics. FVS along with the FFE were used to model treatments such as thinning, removal of created slash, pile burning, broadcast burning and effects of wildfires under specific parameters. The FFE estimates crown fire hazard based on tree, stand and site characteristics, and expresses fire hazard effects in terms of crowning index, torching index, flame length, tree mortality and potential smoke production.

#### **No Action**

##### **Direct and Indirect Effects.**

The No Action alternative would provide no protection to the communities of Eagar, Springerville and surrounding land from wildfire. Under this alternative aerial fuel, fuel ladders and crown bulk density would increase and stand densities would remain the same and over time increase. This alternative does not reduce the fire hazard potential in and around the communities.

This alternative proposes no burning. The continued accumulation of ground fuels would result in greater fire intensity, rate of spread and ladder fuels. The current threat of a stand replacing wildfire would persist and likely increase. The current drought will cause mortality in trees due to competition and an insect outbreak is highly possible.

All the predicted flame lengths for this alternative are over 4', indicating that the use of engines, dozers and aircraft would be required for suppression. Fire behavior predictions show that surface fire, passive crown fire and active crown fire will be present across the analysis area. The Torching and Crowning Index Hazards are Moderate to High.

The No Action Alternative would not produce any smoke, other than by wildfires. Because of fire control difficulties due to increased fuel loading, future wildfires would be expected to become large-scale with more smoke per acre produced than with implementation of the proposed action (Fire / Fuels Specialist Report, Project Record # 50).

**Cumulative Effects.** Fires have been an integral part of all ecosystems in the project area and the continued exclusion of fire from these ecosystems would cause effects that may be

undesirable. The project area is not a static ecosystem, “No Action” does not mean that nothing would change. Continued fire suppression and lack of prescribed fire has known effects. These include increased fuel loads and tree stocking levels over time. Both of these factors are known to increase fire intensity and severity. In the absence of planned fuel treatments, wildfire or other natural disturbance, predicted flame lengths, fuel loading, and tree stocking levels would increase in future years.

### ***Proposed Action***

#### **Direct and Indirect Effects.**

This alternative provides the greatest opportunity for protection to the community and surrounding lands by reducing flame lengths, torching index, crowning index and fire type.

After treatment, all the predicted flame lengths for this alternative are less than 4', indicating that suppression with engines and handcrews would likely be successful. Fire behavior predictions show that surface fire will be present across the analysis area. The Torching and Crowning Index Hazards are Low.

This alternative would reduce the fire hazard potential within the analysis area and increase the fire resiliency of the surrounding forested ecosystems. This would be accomplished by substantially reducing the occurrence of ground fuels, ladder fuels and by providing appropriate crown spacing in key portions of the forested acres, thus reducing the potential for crown fire initiation and crown fire spread.

Wildfires in the near future would not likely result in stand replacing wildfires. Fire Regime Condition Class (FRCC) on the majority of the area is rated as 3, a high departure from the historical condition. Current GIS layers indicate that there is 23% of the forested acres in FRCC 1, 13% in FRCC 2, and 64 % in FRCC 3. Following treatment, approximately 77% of the forested area would be made up of FRCC 1; 20% in FRCC 2 and 3% in FRCC 3. However, natural fire or maintenance burns would be required to maintain those acres in FRCC 1 & 2.

Management actions under the proposed fuel reduction treatments would produce smoke. Objectives of the project cannot be achieved without producing some smoke, however this smoke would be produced under controlled conditions. Smoke would be generated when impacts to the community would be lessened, such as under adequate ventilation, favorable winds and by reducing area burned. Smoke could result in a short-term impact to the communities of Eagar and Springerville since they are located immediately adjacent to the analysis area. Smoke from the prescribed burning under the proposed action will comply with ADEQ requirements for permitting, reporting and accomplishment. Smoke emissions modeling will be completed as part of the permitting process. Wildfires are expected to be smaller and more easily controlled under this alternative, resulting in less smoke produced per acre than a large-scale wildfire.

Air quality impacts other than smoke are limited to dust generated by equipment or vehicles from treatment activities. These impacts are expected to stay within the analysis area and the expected overall impacts are negligible.

**Cumulative Effects.** Fire suppression, grazing, timber harvesting, and the roading of the landscape have changed the disturbance regime in the project area. This has caused significant changes in forest structure, density, and species composition since European influences began around the turn of the past century. This dramatically increases the potential of intense wildfire burning through the project area. The current proposal intends to reduce the potential for large-scale intense wildfires on the area. This proposal includes maintenance burns in order to meet fuels the reduction objective. There are in total or in part six livestock grazing allotments authorized within the project area. Livestock grazing can effect fine fuels. Livestock use may be deferred, if necessary in order to establish grasses in sufficient quantity to carry fire, prior to burning (Appendix B, Best Management Practices). No other foreseeable future actions on the project area are known at this time.

## Vegetation

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This section summarizes the effects analysis described in Project Record # 38, Silviculture Specialist Report.

### **No Action**

#### **Direct and Indirect Effects.**

Stand densities will not be reduced under this alternative. Fire risk will remain high. Growth of forest stands will continue to slow down as they continue to get denser. Health and vigor of the trees will continue to decline as stands become denser. Native cool season grasses, shrubs, and forbs will continue to decline in vigor and growth with no new openings in the canopy created. Mortality of over-mature trees in the overstory will occur at an increasing rate adding to a high fire hazard potential. Natural openings will not be maintained. Stands will continue to become thicker with conifer regeneration, which is gradually encroaching on the remaining openings. Quaking aspen will not be released to grow within these areas and will eventually be shaded out and die. Without treatment, the trend in vegetative structural diversity is expected to remain relatively similar for the next 10-20 years, unless disturbed by some major natural event.

In the absence of treatment, the risk of bark beetle activity is expected to increase.

Under this alternative, the dwarf mistletoe infection levels will continue to intensify and spread over time.

No new stands would be allocated and managed to develop old growth characteristics. Fire hazard would remain high.

**Cumulative Effects.** In the absence of fire or other major natural event, forest structure and wildlife habitats would continue trending as more decadent, densely stocked, multi-storied stands, with interconnected canopies and late successional tree species dominant in all stories.

As stated above, openings would continue to decrease and the canopy would become more enclosed. Bark beetle risk would continue to increase as competition increases for water and nutrients. The likelihood for sustained crown fire would continue to increase. As a result, overall forest health on most acres would also continue to decline, with diminished resiliency to survive severe environmental disturbances. The health and vigor of potential and existing old growth stands would continue to decline and the risk of losing the large tree component to a wildfire would increase.

### ***Proposed Action***

#### **Direct and Indirect Effects.**

This alternative will reduce tree densities on most of the analysis area. Tree densities in treated areas would be reduced by approximately 75% on gentle slopes (< 40%) and by approximately 50% on steep slopes (> 40%).

Reductions in tree densities would reduce residual tree competition and stress, thus improving tree health and vigor to survive drought and resist insect/disease attacks. The risk of bark beetle activity is expected to decrease. Dwarfmistletoe infection level is expected to decrease where selective thinning by mechanical means occurs. Areas that are prescribed burned only could see an increase in dwarfmistletoe infection levels. An increase in the amount and vigor of forbs and grasses is expected. Treated acres would be returned to a much more normal range of natural variability, with improved forest health, structure and resiliency to survive a wildfire, with fewer acres supporting an extreme or moderate burn severity.

This alternative focuses on removal of smaller diameter trees (ladder fuels) and retention of larger diameter trees. Much of the analysis area will see a shift from forest stands with a mix of tree size and age classes to stand structures made up predominantly of larger diameter trees. In addition, there will be a shift from dense tree cover to more open conditions with an increase in the understory herbaceous component. However, this alternative will provide a diversity of tree size/age classes on portions of the analysis area. The Mexican spotted owl PAC and northern goshawk PFA stands, existing and potential old growth stands and deferral areas will remain denser than other treated areas. Restoration treatments in the PP type will result in more open conditions, but will encourage retention of a diversity of size/age classes where evidence of presettlement trees occurs.

Proposed existing old growth stands scheduled for thinning would receive minor fuel reduction treatments that would maintain old growth characteristics. Proposed potential old growth stands scheduled for thinning would receive minor fuel reduction treatments and the large tree component would be enhanced, thus moving the designated stands toward an old growth condition. The FLMP criteria for existing/potential old growth would be met in stands identified for old growth management on 20% of project-forested acres.

Removal of most conifers from grasslands would occur to restore open grassland conditions.

**Cumulative Effects.** High stand densities currently occur throughout the project area due to past treatment or lack of treatment. Within the last 20 years about 2,184 acres within the analysis area have been treated in timber sales or multiproduct sales, but stand density is still higher than desirable from a health and vigor standpoint.

The project area would require maintenance treatments accomplished beyond the timeframe of this project to maintain low to moderate stand densities for fuels reduction and increased large tree growth.

Without maintenance treatments, fire risk will increase as thick stands of regeneration become established in openings created by these treatments. With maintenance treatments, fuel loading would remain at low to moderate risk levels and stand health, tree vigor, and growth would increase. Larger trees would be released by removing smaller less vigorous trees from below. In PP restoration treatments (3559 acres) retention of a diversity of tree sizes and ages would be encouraged where evidence of presettlement trees occurs. Reduced stocking would relieve competitive stress among remaining trees, improve vigor, and make them less prone to successful bark beetle attack.

Maintenance burning would maintain a large portion of the project area in the larger size tree classes (VSS 5 and 6). However, because of the age of the overstory, current drought conditions, the ongoing bark beetle outbreak, and the presence of dwarf mistletoe in some stands within the project area, a number of these trees would likely die within the near future. Vegetative structural stages 3 and 4 would continue to be thinned to allow the healthier trees to grow into the larger classes.

In the short term (10-15 years), regeneration areas would be created to increase the percentage of the area in VSS 1; however, the objective of these treatments is to reduce wildfire hazard, so maintenance treatments may be implemented to avoid the creation of thick stands of conifer regeneration.

In the long term (15 years +), the combination of these factors would result in deficits in replacement trees from the smaller size classes to grow into the larger classes. Sanitation and salvage treatments may become necessary to remove dead and dying ponderosa pine before these trees add to the fuel loading in the area.

No other foreseeable future actions on the area are known at this time.

## Social and Economics

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This section summarizes the effects analysis described in Project Record #37, Social and Economic Resources Specialist Report.

### Economics

Table 3. Estimated economic value comparison of the No Action and Proposed Action alternatives.

Alternative	Volume of Products Ccf <sup>1</sup>	Estimated Revenue from Products	Estimated Cost of Treatments
No Action	0	0	0
Proposed Action	(Approximate) 25,162	\$251,620	\$8,113,944

<sup>1</sup>Ccf = 100 cubic feet

### Recreation

#### Developed Recreation

Developed recreation improvements include Saffel Canyon OHV trail, Murray Basin Non-motorized trail, Outlaw Non-motorized trail and Point of the Mountain Scenic Overlook. Dispersed recreation includes a multitude of things such as hunting, fishing, hiking, wildlife viewing, horseback riding, ATV riding, bike riding, and forest products gathering, to name a few.

Recreation Opportunity Spectrum (ROS) is used to describe the kind of recreation experience one may have in a given part of the National Forest. ROS Classification in the analysis area includes areas classified as Rural, Roded Natural, Semi-primitive Motorized, and Semi-primitive Non-motorized. The analysis area consists of 21,779 acres. Four hundred thirty four (434) acres is classified as Rural, two thousand, four hundred four (2,404) acres are classified as Roded natural, seventeen thousand, nine hundred three (17, 903) acres is classified as Semi-primitive motorized and one thousand thirty eight (1,038) acres is classified as Semi-primitive Non-motorized

Visual Quality Objectives (VQO's) are an assessment of the relative visual resource quality on National Forest system lands as it relates to potential resource use and or development. VQO's in the analysis area include: 1) Management Area One – Forested Land for foreground, middleground and background in Retention, Partial Retention, and Modification and 2) Management Area Two – Woodland for foreground, middleground and background in Retention and Partial Retention.

## ***No Action***

### **Direct and Indirect Effects.**

Implementation of this Alternative would not impact any of the above developed sites. No change in ROS or VQO would occur. In the event of a catastrophic wildfire, the visual quality of these sites could be impacted and the trailhead facilities themselves may be moderately to severely affected. The Water Canyon Trailhead has the greatest potential of being completely burned and inundated with sediment. The other developed sites are located along a road, in or near meadows, and on the north side of the WUI area and are somewhat protected from wildfires within the WUI area.

This Alternative would not impact any of the above dispersed recreation activities. In the event of a catastrophic wildfire, the visual quality of the sites would be impacted until recovery of damaged resources occurred. Habitat for certain kinds of wildlife would be destroyed. Existing wildlife viewing opportunities would be diminished. The quality of the recreational experiences would be altered.

**Cumulative Effects.** Cumulative effects would be based on the forest health in the project area. Continued beetle infestations would increase the number of hazard trees and dead trees. Heavy fuel loading in the project area would subject the area to a higher probability of large-scale wildfire. These conditions could degrade the visual quality of the area.

## ***Proposed Action***

### **Direct and Indirect Effects.**

The ROS classifications and acres per classification will not change with the treatment proposed for Eagar South WUI. Forest Plan standards and guidelines for ROS will be met with the treatments proposed in the Eagar South WUI. Forest Plan standards and guidelines for VQO's will be met with timber treatments proposed in the Eagar South WUI project.

In the short term, increased use of roads and temporary closure of areas while treatments are conducted would disrupt some recreational opportunities. Improvements of roads would provide increased ease in accessing the forest. Opportunities for wildlife viewing of certain animals would be increased, as sight distances increase within the treated area. In the long term and with the reduced probability of a catastrophic wildfire, the visual quality of the area would be maintained, and perhaps enhanced. Non-motorized dispersed recreation may be enhanced as the area recovers from the short term effects of treatment. Certain wildlife populations are likely to increase due to the opening of the stands and daylighting of the forest floor, creating an increase in herbaceous plants.

**Cumulative Effects.** The proposed project would not deter recreational activities over the long term (after treatment). Recreation activities that traditionally occur in the project area would continue into the reasonably foreseeable future. Proposed project activities are projected to occur in the next 5 to 15 years and the economics of the proposal are displayed in Table 3 above. The proposed project would not disproportionately affect minority or low-income

populations, and therefore would not require further Environmental Justice analysis (Executive Order 12898).

## Transportation System

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This section summarizes the effects analysis described in Project Record # 42, Transportation System Specialist Report.

### **No Action**

**Direct and Indirect Effects.** No fuel treatments would be completed and current management of existing roads would continue.

**Cumulative Effects.** Minimal progress would be made towards the established Objective Maintenance due to limited funding for road management. Roads would continue to deteriorate through use by high clearance vehicles, OHV's, mountain bicycles, etc. without concurrent maintenance and upkeep. Some of these roads could possibly deteriorate to the point where they would no longer be accessible to high clearance vehicles, including fire suppression equipment. This would limit access for firefighting ground resources and would reduce the firefighter safety factor.

### **Proposed Action**

**Direct and Indirect Effects.** Successful implementation of mechanized treatments for the project is dependent on the ASNFs road system. A Project-Level Roads Analysis Procedure (RAP) covering all road levels has been completed (Project Record #60).

A list of roads that would be used for the project is included in Appendix I of the Transportation System Specialist Report. A map illustrating existing roads, potential roads for decommissioning, roads within Streamside Management Zones, and road location by objective maintenance level can be found in Appendix III of the Transportation Specialist Report. Road maintenance treatments for identified system roads within the analysis area are described in the Specialist Report. Treatments would bring the roads currently not meeting objective maintenance levels into conformance and meet BMPs to minimize erosion and sedimentation.

To access the proposed treatment areas and complete the vegetation treatments, the existing road system would be utilized and Maintenance Level 1 roads would need to be re-opened. These roads would then be re-closed when fuels treatments are completed. Temporarily opened Maintenance Level 1 roads and Maintenance Level 2 roads would be closed to the public during operations. This would provide for public safety, reduce the need for additional turnout construction, and provide for a more efficient administrative and contractor use of the travel routes during fuel reduction activities. Landings will be located a short distance from major haul routes to provide for safety during implementation. No new permanent roads would be built for this project. Road maintenance, construction, and use would conform to the Project Road Specifications found in Appendix II of the Specialist Report.

**Cumulative Effects.** Cumulative effects of this Alternative would be to reduce fuels and large-scale wildland fire potential while providing for increased public and firefighter safety. This would necessitate periodic re-entries into the treatment areas so that the prescriptions can be maintained, continued, and enhanced over time. Various roads classified as Maintenance Level 1 would need to be re-opened and re-closed when periodic re-entries occur. In addition, there are several roads designated as Key Fire Control Roads. Maintenance of these roads would need to be performed on a regular basis in order to maintain them in adequate condition.

## Wildlife

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This section summarizes the effects analysis described in Project Record # 51 Wildlife and Fisheries Specialist Report and #59 Biological Assessment and Evaluation (BAE).

### *No Action*

**Direct and Indirect Effects.** The Project area would maintain 21,779 acres of forest land at near current tree density. Current fuel loading, accumulated through wildfire suppression, will continue to threaten the watershed with the potential for catastrophic fire for all species. Conifer encroachment will continue in meadow and riparian habitats, decreasing forage production for grazing species. This alternative will improve habitat condition for density dependent species and negatively impact species that depend on healthy browse and grass components. Since no treatments will occur, there will be no actions to stimulate the growth of these habitat components. All wildlife species habitats would remain in their current condition until natural events or other planned activities change them. Wildlife populations will probably not change significantly, with the implementation of the no action alternative.

**Cumulative Effects.** Past activities have led to forest habitat conditions at a high risk of burning in a catastrophic wildfire. There is no way to predict where or when or to what level the project area would be impacted by wildfire. However, large scale high intensity fires can have significant negative effects to wildlife habitat components.

### *Proposed Action*

**Direct and Indirect Effects.** The current condition in Eagar South WUI project area is altered through treatment under this alternative. The potential for catastrophic fire will be lessened from current conditions. Current fuel loading, accumulated through wildfire suppression, will be reduced through timber harvest and prescribed burns. Conifer encroachment will be addressed through meadow treatments, increasing forage production for grazing species. Maintenance prescribe burns will be conducted and will provide improvement to habitat for wildlife species that depend on healthy browse and grass components. Where dense stands are retained (i.e. MSO habitat), important habitat components will have greater protection from catastrophic fire events. Wildlife populations will probably not change significantly, with the action alternative, but habitat conditions are expected to improve and be better maintained over time.

The Eagar South BAE concluded that the proposed project is not likely to adversely affect the Bald Eagle, Mexican Spotted Owl, Southwestern Willow Flycatcher, Black-footed ferret, Jaguar, Chiricahua leopard frog or Apache trout. The proposed project is likely to adversely affect Little

Colorado spinedace and its critical habitat from short term increases in downstream sediment movement.

In the long-term this project will improve the production of grasses and understory vegetation, which are important to many threatened, endangered, proposed and sensitive (TEPS) species by removing some of the overstocked forested stands. There may be short-term impacts due to the modification of vegetation and impacts resulting from increases in sedimentation levels in downstream aquatic habitats, but these impacts will be of short duration and are not likely to jeopardize the continued existence of threatened or endangered species or result in a trend toward federal listing or loss of viability of any species.

Species utilizing riparian or aquatic habitats within the Eagar South WUI action area may be directly and indirectly impacted by timber removal, pile burning and broadcast burning throughout the treatment area. In the project area, riparian habitats that will likely see some level of direct disturbance include those associated with the Water Canyon drainage, wet meadows and adjacent to spring sources. Sensitive species associated with riparian areas may have individuals of a species impacted but this disturbance is not likely to result in a trend toward Federal listing or loss of species viability. Over the long-term, the fuel reduction treatments should be beneficial to all riparian dependant species as the chances for catastrophic fires are decreased.

Species utilizing montane grassland habitats may be impacted by meadow restoration treatments and maintenance prescribed burns. Sensitive species associated with grasslands may have individuals of a species impacted but this disturbance is not likely to result in a trend toward Federal listing or loss of species viability.

The selection and implementation of the action alternative would best meet the short and long term needs of the greatest number of wildlife and plant populations that occur or may occur in the Eagar South WUI project area. Directly and/or indirectly and cumulatively, all TEPS/MIS/Game species would benefit the most by the selection and implementation of this alternative because of expected improvements in their habitat capability and in increased prey species habitat capability and level of fuels reduction. The implementation of this alternative would contribute to 1) reversing the slow decline in habitat quality that resulted from past management; 2) maintaining viable species populations; 3) preventing the trend toward federal listing of sensitive species that occur in the Eagar South WUI project area, and 4) protecting the area from catastrophic fire.

**Cumulative Effects.** There are unavoidable impacts associated with treatment activity included in the proposed action. These include a temporary increase in disturbance levels; a short-term increase in large fire potential until treatment of activity fuels is completed; and minor soil displacement prior to re-establishment of vegetation and ground cover. Mitigation measures help reduce these impacts, but they will occur. They are short term in duration and minor in consequence at the landscape scale.

There are no known current or proposed projects on the adjacent Apache Reservation or lands of other ownerships proximate to the Eagar South WUI that would create cumulative effects. The possible exception would be a combination of smoke from prescribed burns conducted by both the Apache-Sitgreaves Forests and the Apache Reservation during brief burning windows in the spring and fall. But these burns are coordinated through ADEQ smoke management procedures to mitigate any cumulative effects.

There are in total or in part six livestock grazing allotments authorized within the project area. Included in the decisions on these allotments are actions that help lessen impacts to wildlife and wildlife habitat such as proper grazing season and conservative utilization standards. There are approximately 110 miles of roads within the project area at various maintenance levels. There are three large-scale thinning projects adjacent to or in close proximity to the Eagar South project area. These projects include: the Mineral Ecosystem Management Area (approximately 15,000 acres), which is proposed for treatment between 2004 and 2007; Greer WUI project (approximately 20,000 acres), and the Nutrioso WUI project (approximately 42,000 acres) which are proposed for treatment over the next decade. The Mineral project is approximately 15 miles to the northwest of the proposed action. The Greer and Nutrioso WUI projects are adjacent to the Eagar South WUI project area. The Forest Highway 43 project consists of the paving of an already existing highway which at the closest point is approximately 10 miles from the Eagar South WUI project area. Implementation of the proposed action will be phased in over several years and localized in smaller areas across the landscape, lessening impacts to TEPS species. Localized disturbances to terrestrial species may result in displacement of some individuals during project implementation. Altered habitats may permanently displace some of these species from the areas treated, although considerable amounts of untreated habitat will remain across the landscape. Overall abundance of terrestrial TEPS species should not be affected. The cumulative effect of these actions can affect aquatic species through alterations in habitat features such as stream channel morphology or aquatic habitat parameters such as pool:riffle ratios, and through changes in aquatic species assemblages which may promote increases in interspecific competition with or predation by non-indigenous, introduced species. Over the long-term, the fuel reduction treatments should be beneficial to all TEPS species as the chances for catastrophic fires are decreased.

## Heritage Resources

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This section summarizes the effects analysis described in Project Record # 43, Heritage Resources Specialist Report.

### ***No Action***

**Direct and Indirect Effects.** No direct or indirect impacts would occur to historic properties.

**Cumulative Effects.** Other than the risk of wildfire, no additional cumulative impacts are anticipated.

***Proposed Action***

**Direct and Indirect Effects.** There would be no direct or indirect adverse impacts to historic properties. The proposal will comply with the *First Amended Programmatic Agreement Regarding Wildland Urban Interface and Other Large-Scale Hazardous Fuels Reduction Projects*.

**Cumulative Effects.** There would be no cumulative effects to heritage resources.

**Soils and Water**

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This section summarizes the effects analysis described in Project Record # 40, Watershed Specialist Report and Project Record # 41, Cumulative Watershed Effects Analysis.

***No Action***

**Direct and Indirect Effects.**

**No Action Alternative (without Wildfire)**

In the absence of wildfire, current trends in the quality or quantity of waters available at the municipal, private, and Forest Service spring developments and well sites in or near the project area would be expected to continue. Current trends in condition of riparian areas within the Eagar South WUI would be expected to continue. Channel and streambank conditions would be expected to remain in a slow improving trend. Sedimentation within drainage channels would be expected to be lowest under this alternative w/o fire, as ground cover remains the highest and infiltration rates would remain unaltered.

The existing conditions and trends of upland soils will continue. However, areas with naturally high rates of soil erosion, such as those areas with soils derived from the Datil formation, will continue to exhibit high rates of sheet erosion where ground cover levels are low. Erosion will also remain a concern in some lower elevation pinyon-juniper sites where grass cover and bare mineral soil is exposed.

The no-action alternative is not anticipated to produce any changes to existing water quality trends in the streams, springs and surface water bodies in or downstream of this WUI. Overall water yield levels are not likely to change under this alternative.

**No Action Alternative (with Wildfire)**

Under this alternative and scenario, damage to the Eagar water development facilities is possible either due to direct impact from wildfire burning surface structures or from the indirect impact of accelerated runoff and erosion. Removal of the Forest canopy in the area around and upgradient of the springs could result in a short term increase in water yield at the spring site. Impacts to water quality would likely be minor except where damage occurs to pipeline or collection facilities.

Little impact would be anticipated to the well water sources off Forest.

The current high stand densities of many of the upland sites, combined with severe fire conditions, could lead to intense fires capable of entering the riparian areas and causing loss of riparian vegetation and some localized areas of severely burned soils. Extensive areas of upland soils, particularly under ponderosa pine and mixed conifer stands, would likely experience moderate to high severity burns in a wildfire. This could lead to dramatic increases in surface runoff and erosion occurring on severely burned upland zones. Resulting flood flows and sediment inputs could destabilize channels and streambanks. Areas of downcutting or excessive sediment deposition could alter existing vegetation structure within the riparian area as well as existing instream structure.

Short term pulse inputs of ash to streams during the first runoff events after the fire could be high enough to have immediate short term impacts on water quality in reaches of streams within the WUI and possibly reaches of streams below the WUI such as Nutrioso Creek. A longer term and potentially more serious water quality concern would be the dramatic increases in sediment that could reach the streams from severely burned slopes for a period of years after the wildfire. Any destabilization of streambanks and downcutting of channels could be another source of sediment input to affected streams.

Overall water yields are likely to moderately increase in the burned watersheds, especially during wet years, for a period lasting until the forest stands are fully regenerated and canopy cover is re-established.

It is possible that a future fire may enter the untreated WUI under less severe conditions where impacts were moderate and at least partly offset by emergency stabilization measures. However, it is likely that under any conditions, a wildfire entering this basin under the no action alternative would have considerably greater impacts to water quality and channel stability than under the proposed action alternative.

### **Proposed Action Alternative**

Under this alternative, direct damage to Coon Creek Spring and the Eagar municipal spring development would be avoided. It is possible that thinning and burning operations in the vicinity of the springs could increase the water yield of the springs, especially in wet years, due to reductions in evapotranspiration. However this may not be a measurable effect.

No measurable effect on off-Forest wells or water tables is anticipated from the project.

Proposed treatments will reduce the canopy cover in riparian areas and thereby have a potential warming effect on stream temperatures. In some areas, particularly within the special riparian management treatment area in Water Canyon Creek, a reduction in conifer canopy cover will likely stimulate the development of deciduous woody riparian vegetation. This may have a positive impact on stream channel stability.

The treatments, in some riparian areas, have the potential to cause a long term reduction in the amount of large woody debris available for future input to the stream channels. In stream reaches where large woody debris plays an important role in stream channel structure and stability, these attributes of the stream channels may be negatively impacted over the long term. Application of BMPs designed to maintain ground cover on the soil surface within the riparian buffer zones should reduce the amount of sediment reaching the channels from harvested and burned upland slopes and prevent excessive levels of sedimentation in stream reaches. The overall scale and timing of treatments in the watersheds of the Eagar South WUI are not sufficient to cause concerns for the initiation of bank cutting and channel incision due to increased runoff. No significant impact to riparian areas and stream channels are anticipated as a result of this proposed action.

Areas of highly erodable soils have been identified and designated as no treatment areas. Consequently, the proposed action will have no effect on these soils other than lowering the risk of potentially damaging wildfires entering them from adjacent areas.

Soil compaction would occur where mechanized vehicular equipment is used to access, cut, and skid or haul wood in areas away from roads. The degree and extent of compaction will be limited by BMPs restricting activities during wet periods. In some areas, the amount of organic material available for maintenance of soil fertility will be reduced. Minimum levels of residual coarse woody debris to maintain soil fertility levels are identified in the BMPs. No long-term effects to soil productivity are expected with the implementation of this alternate, as long as BMPs are implemented

Principal water quality impacts of the actions proposed in this alternative would include increased short term inputs of ash and sediment to stream channels crossing or adjoining the WUI area. The increase in ash would occur in response to prescribed burning in the project area. Implementation of BMPs to retain the filtering capacity of streamside buffer zones and of burn prescriptions to moderate the extent and severity of burns would likely reduce the input of ash to non-significant levels. Increased sedimentation from road surfaces would occur where existing roads are located adjacent to stream channels and insufficient areas exists to allow for filtration of runoff from roads. BMP's designed to reduce erosion from roads, to provide for proper road drainage, to minimize impacts at stream crossings, and to maintain sediment filter buffers adjacent to streams would minimize the overall impacts from roads and prevent excessive sedimentation from most road surfaces. Long-term impacts of sedimentation generated from roads could be mitigated by road closure and/or obliteration once the project is completed.

**Cumulative Effects.** An "Equivalent Disturbed Area (EDA) Analysis was used to compare the impacts of past, current and future activities both on the Forest and on private land within the seven 6<sup>th</sup> Code watersheds containing the project area. The model used in this analysis calculates the runoff inducement potential of various treatments and indexes them to the runoff potential of open roads. Thus the EDA figure represents the percent of the watershed area, which will have runoff related disturbance levels equivalent to that of being in a roaded condition.

Future planned activities in the Eagar South WUI project watersheds were modeled as if they would occur in the year 2006 instead of being staged over a longer period as would normally occur. The analysis indicates that even under a compressed treatment schedule, resulting EDA levels are well below the threshold level of 15% of the watershed. An implementation schedule for project activity that more closely represents that the actual timing of the project would result in even lower percentages of watershed in EDA than the modeled levels. Therefore, we do not expect that the scale or timing of project activities would, on their own, present serious impacts to watershed function.

## Summary of Cumulative Effects

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Aside from past activities near the project area already accounted for in the watershed impacts, there are no known current or proposed projects on adjacent ownerships proximate to the project area that would generate effects that would combine with those of the proposed action to constitute an accumulation of effects. The possible exception would be a combination of smoke from prescribed burns conducted by adjacent Forest Service districts and Native American Tribes during brief burning windows in the spring and fall. These burns are coordinated through State of Arizona smoke management procedures to mitigate cumulative effects. Other current or future foreseeable actions near the project area, previously listed, include the Mineral EMA, the Greer WUI, the Nutrioso WUI, Forest Highway 43, and six grazing allotments.

There would be unavoidable impacts associated with treatment activity included in the proposed action. These include a temporary disruption to wildlife species; a short-term increase in fire potential until treatment of activity fuels is completed; minor soil displacement prior to re-establishment of vegetation and ground cover; and short-term conflicts with residents and recreation visitors in the project area. The impacts would be short term in duration and limited in consequence at the landscape scale.

While the proposed action was designed to prevent the significant loss of resource values that would result from a large-scale wildfire, the effects analysis indicates the treatments themselves are not significant in their direct, indirect and cumulative effects to the human environment. The analysis of effects also indicates that there are no irreversible or irretrievable impacts associated with the proposed action. There are no irreversible resource commitments or irretrievable loss of resources. There are no major adverse cumulative or secondary environmental effects to the ecosystem. Physical and biological effects are limited to the action area of analysis. The proposed action does not involve highly uncertain, unique or unknown risks and does not significantly affect the quality of the human environment.

## AGENCIES, GROUPS, AND PERSONS CONSULTED

### INTERDISCIPLINARY TEAM

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Kathy McMillan - IDT Leader) – Fisheries Biologist, Springerville R.D.  
 Bruce Buttrey – Integrated Resource Specialist, Springerville R.D.  
 Bill Ripley – Zone Silviculturist, Alpine and Springerville R.D.'s  
 Gerald Beddow - District Fire Management Officer, Springerville R.D.  
 Vicente Ordonez – Wildlife Biologist, Springerville R.D.  
 Barbara Romero – Recreation Staff, Springerville R.D

### Consultation With Others

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#### Those Who Provided Input

John MacIvor – District Ranger, Springerville R.D.  
 Judy Palmer – Assistant District Fire Management Officer, Fuels, Springerville R.D..  
 Stacy Weaver - GIS Coordinator, Springerville R.D.  
 Virginia Yazzie/Ashley – Range Staff, Springerville RD.  
 Dr. Charlotte Hunter – Forest Archeologist, Apache-Sitgreaves National Forests  
 David Mehalic – Apache Zone Archeologist, Apache-Sitgreaves National Forests  
 Chris Nelson– Soils,/Watershed/Riparian/Hydrology, Apache-Sitgreaves National Forests  
 Jim Probst – Soils,/Watershed/Riparian/Hydrology, Apache-Sitgreaves National Forests  
 Chris Bielecki – Transportation Planner, Apache-Sitgreaves National Forests  
 Chris Bagnoli – Unit 1 Game Manager, Arizona Game & Fish Department  
 Len Schlesinger – District Manager, Apache Natural Resource Conservation District  
 Bill Ripley – Silviculturist, Springerville RD.  
 Charlie Denton – Wildlife Biologist, Springerville RD.  
 Gary Miller – Forest Engineer, Apache-Sitgreaves National Forests  
 Mike Sumner - Wildlife Manager, Arizona Game & Fish Department  
 Bruce Banke – Forester, Arizona State Land Department  
 Charlie Denton, Sr. – Ecological Restoration Institute  
 John Bedell - Ecological Restoration Institute  
 Dennis Lund - Ecological Restoration Institute

Many members of the public commented on the proposed action. All those who commented are listed in the project record.

### Agencies, Groups and Persons Contacted But Did Not Provide Input

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Letters of notification of the proposed action were sent to the agencies, groups and individuals listed on the Eagar South Wildland Urban Interface Fuel Reduction Project mailing list (Project Record #29). This list is filed in the project record at the Springerville Ranger District in Springerville, Arizona.

## APPENDIX A – Glossary of Terms

**Basal Area (BA):** The cross sectional area of a tree at **DBH** measured as square feet. It is used as a measure of tree density.

**Best Management Practices (BMPs):** A combination of conservation practices that is determined to be the most effective, practicable means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.

**Bole:** The trunk or stem of a cut tree or snag.

**Broadcast Burning:** Allowing a **prescribed fire** to burn over a designated area within well-defined boundaries for reduction of fuel hazard.

**Canopy cover:** The percentage of a fixed area covered by the crown of plants delimited by a vertical projection of the outermost perimeter of the spread of foliage.

**Canopy Fuels:** The live and dead foliage and branches and lichen of trees and tall shrubs that lie above the **surface fuels**.

**Conifer:** A cone-bearing tree with needles or leaf scales, usually evergreen, (e.g. pines, firs, spruces, junipers).

**Crown Fire:** Any fire that burns in **canopy fuels**.

**Diameter Breast Height (DBH):** Diameter of the trunk of a tree measured outside bark at 4.5 feet above the ground level, on the uphill side of the tree.

**Fire Behavior:** The manner in which a fire reacts to the influences of fuel, weather and topography.

**Fire Hazard:** A fuel complex, defined by volume, type, condition, arrangement and location, which determines the ease of ignition and resistance to suppression methods.

**Ladder Fuels:** Fuels that provide vertical continuity between the ground and trees crowns, thus creating a pathway for a surface fire to move into the main forest canopy. Ladder fuels generally occur as shrubs, small trees and trees with live limbs extending to within approximately 10' of the ground.

**Mixed Conifer (MC):** Mixed Conifer - Stands where no one species can be determined to have the majority of dominance in the upper most canopy layer. Species can include aspen, ponderosa pine, white pine, Douglas fir, white fir and other conifers.

**Old Growth:** The final successional stage of a stand of trees, characterized by a high degree of decadence, because of declining health and vigor.

**Pinyon-juniper (PnP):** stands where pinyon pine and various juniper species have the majority of dominance in the upper most layers.

**Ponderosa pine (PP):** Stands where ponderosa pine has the majority of dominance in the upper most canopy layer.

**Post-fledging Family Area (PFA):** Northern Goshawk habitat consisting of a 420 acre area of concentrated use by a goshawk family after the young leave the nest and until they are no longer dependent on the adults for food. A total of 180 acres of nest areas are identified in each PFA. The total PFA size is 600 acres.

**Prescribed Fire:** Any fire ignited by management actions to meet specific objectives. A written approved prescribed fire plan must exist and NEPA requirements must be met, prior to ignition.

**Presettlement Trees:** Living trees that existed at the time of local Euro-American settlement. This may be assessed through increment boring, size or the presence of yellow bark. These trees will be retained.

**Protected Activity Center (PAC):** Mexican Spotted Owl habitat area of 600 acres (minimum size) surrounding the "activity," which is the nest site, a roost grove commonly used during the breeding season in absence of a verified nest site, or the best roosting/nesting habitat if both nesting and roosting information are lacking.

**Remnant Evidence:** All indicators of trees standing at the time of settlement that are no longer present as living trees—including snags, downed logs, stumps, and stump holes.

**Replacement Tree (R):** Younger trees of various ages and sizes within 60 feet of the remnant evidence.

**Riparian:** Narrow strips of land that border creeks, rivers or other bodies of water. Because of their proximity to water, plant species and topography of riparian zones differ considerably from those of adjacent uplands.

**Slash:** Any vegetation that was cut.

**Snag:** A standing dead tree from which the leaves and most of the branches have fallen.

**Stand:** A contiguous group of trees sufficiently uniform in species composition, arrangement of age classes, and condition to be a homogenous and distinguishable unit.

**Surface Fuels:** Needles, leaves, grass, forbs, dead and down branches and boles, stumps, shrubs and short trees.

**VSS 1:** Grass & forb

**VSS 2:** Trees 1-5" dbh.

**VSS 3:** Trees 5-12" dbh.

**VSS 4:** Trees 12-18" dbh.

**VSS 5:** Trees 18-24" dbh.

**VSS 6:** Trees 24+" dbh.

**Wildland Fire Use:** The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in Fire Management Plans.

**Wildland Urban Interface (WUI):** The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland and vegetative fuels.

The sources for most definitions are:

*National Wildfire Coordinating Group. 1996. Glossary of Wildland Fire Terminology, National Wildfire Coordinating Group, Boise ID*

*Restoration of Ponderosa Pine Forests to Presettlement Conditions. 2005. Ecological Restoration Institute, Flagstaff AZ*

## APPENDIX B

**Best Management Practices:** The following are site specific BMPs required for the project: The following list is divided into categories dealing with *watershed, riparian areas, uplands, roads, and noxious weeds*. Some of the *BMPs listed in one category may overlap into another*.

### General Watershed BMPs

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If unforeseen events occur in the future (e.g., large wildfires, prescribed burns producing higher than planned levels of severely burned conditions, etc.) that result in significant disturbances to a sixth code watershed involved in this project which are above those anticipated from this project, an Equivalent Disturbed Area (EDA) analysis will be performed to determine if the watershed has sustained levels of disturbance which are above threshold values (generally interpreted as an EDA level equivalent to 15% of a 6<sup>th</sup> code watershed). This analysis will be used, along with field investigations, to determine if the planned schedule of treatment activities in that watershed needs to be revised to allow for recovery of watershed conditions before the next treatment action there is taken.

### Riparian/Stream/Municipal Water Supply Protection BMPs

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- 1. Use of Project Area Maps for Designating Stream Courses for Water Quality Protection-** Locations of protected stream channels and filter strips (Streamside Management Zones) will be delineated on the project area and contract maps. Riparian areas and meadows designated for protection will also be delineated on the project area and contract maps.

Stream Channel and Wetland Protection –Stream channels and other wetlands to be protected will be shown on the project contract maps along with their associated Streamside Management Zones (SMZs), if applicable. SMZs shall be designated along intermittent and perennial stream channels. Stream channels shall be crossed at designated crossings only and shall be pre-approved by the authorized Forest Service (FS) Officer. Unless approved by the authorized FS Officer, there shall be no mechanized activities within the SMZ (except as provided for in the treatment prescription for treatment area 7). There shall be no skidding or road construction longitudinally within stream channels. There shall be no decking and machine piling of slash within stream channels. There will be no pile or jackpot burning within stream channels. Lead-out ditches or water-bars shall not be constructed in such a manner as to divert run-off into stream channels. Unless designated by the authorized FS Officer, debris generated from treatment activities will be removed from stream channels. Trees designated for removal shall be felled outside the stream channel. Trees, in or on the banks of stream courses with root systems that are providing bank and stream channel stability are not to be removed. The authorized FS Officer will identify exceptions where restoration or additional thinning is needed for resource concerns. The authorized FS Officer will use their authority for skid trail and log landing location to protect, as needed, stream courses that were not designated on the project contract map.

2. **Riparian Treatment Areas, including Wetlands** – Treatment areas 7 & 8 and project area wetlands shall be indicated on the project area contract map and have the following recommendations. Non-riparian species within these treatment areas may be removed to reduce competition for desired woody and herbaceous riparian species. Created slash may be placed in minor drainages to aid in rebuilding of deeply incised gullies and headcuts or elsewhere as needed for erosion control. Ensure proper slash placement during harvesting and slash treatments. Ensure that sediment from disturbed areas does not directly enter the stream system through combinations of seeding of primarily native species, water-bars, wattles or spreading slash.
3. **Streamside Management Zone (SMZ) Designation** –
  - a. SMZ width is based on erosion hazard, existing vegetative groundcover conditions, stream bank and riparian conditions, natural geologic features, and presence of aquatic ESA species. SMZ widths shall be designated as follows:
    - i. Moderate to Severe erosion hazard = 150 feet (slope distance) on both sides of the stream course beginning at the high water mark within the stream channel, or modified as needed to best feasibly protect specific streams/reaches. This includes TES Mapping Units: 140, 515, 574, 577, 591, and 592. The following TES mapping units also have a Severe erosion hazard and are located on slopes over 40%. Therefore, they are too sensitive to justify mechanical treatment, therefore, shall not have any mechanical ground disturbance and include mapping units: 516, 570, 585, 650, and 673. Based upon erosion hazard, Milligan Creek is identified as a 150' SMZ in the project area.
    - ii. For intermittent and perennial stream reaches not meeting the Apache-Sitgreaves National Forests Land and Resource Management Plan (ASNFs LRMP) Standards for Management Area 3, SMZ widths shall be 150 feet (slope distance) on both sides of the stream course, based on stream bank and riparian condition. Based upon ASNF's LRMP Standards as described above, Milligan Creek and Grapevine Canyon are identified as 150' SMZs in the project area.
    - iii. Intermittent and perennial stream reaches containing aquatic ESA species (South Fork Little Colorado River) = 300 feet (slope distance) on both sides of the stream course beginning at the high water mark within the stream channel, or modified as needed to best feasibly protect specific reaches. South Fork Little Colorado River is identified as a 300' SMZ in the project area.
  - b. Activities permitted within the SMZ are limited to non-mechanized treatments, unless approved by the authorized Forest Officer. Directional falling of trees shall be away from the stream channel. Ground skidding, decking of logs and machine piling are

permitted only on existing roadbeds that are located within SMZs. Road construction, and burning of concentrated slash are prohibited within the SMZ. Stream channels to be protected within SMZs will be identified on watershed and project area contract maps. Stand prescriptions shall include a sketch of the SMZ location and width. SMZ restrictions described above in section 3b. do not apply to treatment area 7.

4. **Treatment of Ephemeral Drainages** -- Ephemeral drainages are recognized in the following ways. They form the lowest spot of the surrounding ground. They form obvious channel continuity along its length and joins with more obvious channels downstream. They show evidence of having run water on previous occasions, i.e., litter and vegetation has moved, or there is a lack of litter in the channel.

The water quality objectives for harvest treatments within close proximity to ephemeral drainages is to provide for or to retain sufficient amounts of ground cover possible to mitigate sediment input to stream system and to minimize the number of crossings to retain stream bank and stream bottom stability. No specific stream buffers are recommended, however, there are harvest techniques that aid in the retention of ground cover and are considered Best Management Practices. The following are recommended BMPs for harvesting activities around ephemeral drainages, *whether designated on a map or not*.

- a. No skidding will be allowed up or down ephemeral channels or in low points or swales.
- b. No road construction will be allowed in or immediately adjacent to ephemeral streams except at designated crossings.
- c. All skid trails crossing drainages will be designated and approved by the authorized FS officer prior to activity, and will be at right angles to stream banks.
- d. Minimize the number of skid trail and road crossings across these channels.
- e. Maintain an undisturbed filter strip of vegetation and litter between skid trails/log decks/roads and the channel wide enough to prevent sediment from entering the channel.
- f. Construct water control features (waterbars, leadout ditches etc.) on these skid trails and roads.
- g. Minimize the amount of logging debris deposited in ephemeral channels and remove excess debris by hand or end lining with except where coarse woody debris is needed for stream health as identified by fisheries or watershed specialists.
- h. Do not cut trees where the root system is important in maintaining the integrity of the bank.
- i. No log decks will be located within or immediately adjacent to the ephemeral streams or depressions.
- j. The preferred method for extracting biomass using feller-buncher or grapple skidder equipment near ephemeral drainages (within 75 feet) will be to approach the material to be extracted on the contour as much as possible to the ephemeral drainage, cut or grapple biomass, then back equipment out as much as possible. This action will reduce ground disturbance by limiting the turning of equipment in or near the stream channels, and will retain as much of the filtering effect of undisturbed ground cover as

possible. Slash can be placed to drive equipment over to reduce rutting and soil disturbance.

- k. Minimize or eliminate blading of roads within 50 feet of direct tributaries to critical fisheries habitat (T&E habitat) if subsequent road surfacing does not occur on roadbed. In the project area direct tributaries would include Milligan Creek and all direct tributaries to South Fork Little Colorado River, Rudd Creek, Nutrioso Creek and all direct tributaries to the Little Colorado River not fully diverted or intercepted by diversion ditches prior to reaching the Little Colorado River.
  - l. Outslope roads/skid trails to minimize concentration of water/sediment into streams closer than 50 feet to channel.
  - m. Place water control features so there is adequate filter distance between structure outlets and stream channel (minimum of 50 feet and width can increase as slope steepness increases).
  - n. There will be no pile or jackpot burning within ephemeral stream channels.
5. **Log Landing Location** - Log landings (decking areas) shall not be allowed in meadows, riparian areas, stream channels, and SMZs. The authorized FS Officer may authorize landings, in these areas, if required. These treatment areas will be clearly designated on the project area contract map.
6. **Slash Treatments in Sensitive Areas** - Mechanical slash piling shall not occur in meadows, SMZs, and riparian areas.
7. **Wetlands, Springs, Seeps and Meadow Protection During Tree Removal Activities** – These areas will be protected from treatment activities and include a 50 ft buffer that excludes mechanized equipment. Treatments may occur within these areas if specific restoration objectives are identified and approved by the FS Officer. This BMP will be applied to treatment area 8 as well as mapped and unmapped wetlands, springs, seeps and meadows.
8. **Prescribed burning treatments** - For the retention of long term soil productivity, to maintain the sediment filtering capacity of streamside management zones (SMZs), and to reduce erosion, burn to allow for low to moderate burn intensities. Within SMZs, Forest Service Biologists and watershed specialists will be involved in the development of prescribed burn plans.
- a. Fire control lines shall not be constructed on slopes greater than 40% or within SMZ's. Exceptions will be identified by the authorized FS Officer and specific mitigations will be determined at that time.
  - b. Ignition shall be above slope breaks of active floodplain. Fire will be managed such that burning into streamside management zones is limited to 15% or less of the area identified as the SMZ. Utilize jackpot burning where appropriate.
  - c. Livestock grazing will be coordinated with prescribed burning, especially relative to drainages and their floodplains. Livestock use may be deferred, if necessary in order to

establish grasses in sufficient quantity to carry fire, prior to burning, or to protect new growth after burning.

9. **Servicing and Refueling Equipment** - During servicing or refueling of equipment, pollutants shall not be allowed to enter any waterway, riparian area or stream course. Select service and refueling areas well away from wet areas and surface water, and by constructing berms around such sites to contain spills. Spill prevention, containment and countermeasures plans are required if the fuel exceeds 660 gallons in a single container or if total storage at a site exceeds 1320 gallons. The project contract administrator shall designate the location, size and allowable uses of service and refueling areas. The authorized FS Officer shall be aware of actions to be taken in case of a hazardous substance spill.

The contractor shall take all reasonable precautions to prevent pollution of all National Forest soil and water. Equipment operators shall maximize the recovery and proper disposal of all fuels, fluids, lubricants, empty containers and replacement parts. Refuse resulting from the contractor's use, servicing, repair or abandonment of equipment shall be removed from National Forest system lands by the contractor to the appropriate disposal facilities. Any leaks originating from contractor equipment shall be repaired or the equipment replaced in a timely manner.

No refueling of equipment (other than hand held equipment) will be allowed within the contaminant restriction zone for the Town of Eagar municipal water development at Coon Springs. This restriction zone will be delineated on a map of the project area and in contract maps.

10. **Protection of Town of Eagar Municipal Water Development at Coon Springs**

A map showing the following described no mechanical entry buffer zone and contaminant restriction zone will be included in the project and contract documentation.

- a. In order to reduce the risk of accidental contamination of the Town of Eagar water supply development at Coon Springs, no vehicular entry for project purposes will be allowed within the buffer zone designated for the Coon Creek drainage above Coon Springs. Hand felling of trees, end-lining of tree boles from outside of the buffer zone, hand treatments of slash and low to moderate intensity fire with protection of all developments are all allowed within this zone. No restriction is intended on vehicular traffic necessary for the maintenance of the Coon Springs water development.
- b. The closure of the section of Forest Road 8025A in the Coon Creek drainage above Coon Springs (delineated on the above mentioned map) shall be hardened to prevent all vehicular entry including ATVs.

c. No storage of fuels or other potential water contaminants will be allowed within the contaminant restriction zone shown on the above mentioned map. No bulk transport (over 50 gallons) of fuels or other potential water contaminants will be allowed within the contaminant restriction zone except on SR261 and FR8070A (Phoneline Road).

d. Care will be taken in felling and end-lining of trees, prescribed burns and other management activities to prevent structural damage to the water development and associated fences at Coon Springs and to the chlorination facilities located on National Forest land adjacent to SR261.

e. In order to reduce the risk of structural damage to the pipeline facilities associated with the Coon Springs water development, the alignment of the pipeline will be flagged on the ground before any treatment is commenced in the area of the pipeline. Vehicles shall not cross the alignment or operate within 15 feet of the alignment except where reinforcement currently exists or has been provided to protect the pipeline. Trees will not be felled across exposed sections of the pipeline.

## Upland related BMPs

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1. **Limit the Operating Season** - Ground disturbing activities (tractor skidding, decking and machine piling, etc.) shall be limited to dry or solidly frozen soil conditions to reduce compaction and soil displacement (rutting) that is associated with tree removal activities when soils are wet or are saturated. Hauling and skidding will be restricted on all soils by the contract administrator during wet periods to prevent damage to the road system. (See A/S Guidelines for Excessive Rutting, 6/10/92).
2. **Log Landing Erosion Prevention and Control** - Immediately after use, landings will be scarified as needed to eliminate compaction. Once scarified, log landings are to be reseeded, as needed, with an erosion control seed mix consisting of primarily native species. Slash or chips will be scattered on landings to further retard formation of rills and gullies.
3. **Tractor Skidding Design** - Skid trails will be designated or approved by the authorized FS officer in conjunction with the contractor. To minimize soil disturbance by equipment use, trees are to be felled to the lead and the authorized FS officer shall locate skid trails as far apart as possible to reduce the number of skid trails needed to harvest the unit. Use existing skid trails where properly located. Designate new skid trails throughout the project area to prevent long, straight skid trails from running up and down slopes. Skidding of logs will be with one end of the log suspended above the ground surface. Skidders will be required to stay on the skid trail system, except where other objectives take priority (like maximum site disturbance wanted for seed cuts, etc.), which shall be noted on the stand prescription field card.
4. **Erosion Control on Skid Trails** - Skid trails will be water-barred, scarified and seeded with primarily native species as needed. All berms and depressions such as ruts will be filled in or removed, restoring skid trails to the natural grade of the slope to the greatest extent possible. In addition, slash generated from the project may be spread in addition to water barring where conditions require. *Emphasis added: The authorized FS Officer will use their*

full authority to ensure that extra care is exercised by equipment operators when working on soils of moderate and severe erosion hazard (especially soils derived or influenced by the Datil geologic formation) within the Eagar South area. All bare ground and ruts shall be treated with slash or mulch to prevent initiating severe sheet and gully erosion.

5. **Soil Productivity/Coarse Woody Debris** - To maintain or improve soil productivity in areas over ½ mile from private land, manage towards a minimum of 5-10 tons/acre of coarse woody debris in pine types, in the 3" + size class. Where 5-10 tons/acre of coarse woody debris currently exists, break up the continuity to reduce potential fire spread. Reduced levels of organic debris may be allowed within fuel-breaks. Manage towards a minimum of 8-16 tons/acre on mixed conifer sites of large woody material (3"+).

Within ½ mile around private land; to maintain or improve soil productivity and maintain low fuel loads, manage towards a minimum of 3-6 tons/acre of coarse woody debris in pine types, in the 3" + size class. Manage towards a minimum of 5-10 tons/acre on mixed conifer sites of large woody material (3"+).

Ground cover shall be maintained on all sensitive soils. "Sensitive soils" have moderate or severe erosion hazard and include TES Mapping Units: 140, 515, 538, 574, 577, 591, and 592. The steep TES mapping units also have a severe erosion hazard and are located on slopes over 40%. Therefore, they are too sensitive to justify mechanical treatment, therefore, shall not have any mechanical ground disturbance and include mapping units: 516, 565, 570, 650, and 673. Additionally, there will be no mechanical ground disturbance in pinyon-juniper treatments on sensitive soils (listed above) on slopes less than 40%.

6. **Machine Piling of Slash** – Where slash is machine piled, minimize disturbance to existing ground cover, surface soil and rock material and any existing surface organic material (i.e. surface litter and duff and old semi-decomposed branches and logs). Rough piling will also reduce impacts from equipment. Rough piling involves piling only large concentrations of slash, leaving areas of low concentration undisturbed. Machine pile when soils are dry or solidly frozen. Refer to ASNFs Guidelines for Excessive Rutting, 6/10/92, as a guide to determine when soils are too wet to operate. Keeping slash piles free from soil material will minimize smoldering of piles when burning, which should have a positive effect on air quality. Refer to #5 above for retention of coarse woody debris.
7. **Acceptance of Project Erosion Control Measures Before Project Closure** - The authorized FS officer will verify that the contractor has implemented erosion control practices prior to the closure of the project contract.

Conduct Implementation and Effectiveness Monitoring for Best Management Practices – The desired result of BMP monitoring is to document forest practices and BMPs that appear effective in reducing sediment and moderating flow regimes in forest streams. BMPs that are found to be ineffective in protecting identified resource, aquatic and water quality goals will be adjusted.

8. **Prescribed Burning in Sensitive Upland Soils** – Low burn severity is generally recommended for treatments. Low soil heating or light ground char occurs; mineral soil is not changed; leaf litter may be charred or partially consumed, and the surface of the duff may be lightly charred; original forms of surface materials, such as needle litter or lichens may be visible; very little to no change in runoff response. Indicators include very small diameter (<1/4 inch) foliage and twigs are consumed, some small twigs may remain; generally, foliage may be yellow; the surface is mostly black in a grassland or shrubland ecosystem, but some gray ash may be present; above-ground portions of vegetation may be consumed, but root masses are intact. Change in runoff response is usually slight. (Parsons, 2003)
- a. Prescribed burning in steep and erosive soils (TES mapping units: 516, 570, 650, and 673) shall not exceed low severity overall to avoid removal of critical ground cover. Areas exceeding low severity burns may need to be re-covered with mulch (slash & brush) to avoid initiating severe sheet and gully erosion.
  - b. Prescribed burning in accessible moderate and severe erosion hazard soils (TES Mapping Units: 140, 515, 538, 574, 591, and 592) shall not exceed low severity overall in order to retain critical ground cover. Areas exceeding low severity burns may need to be re-covered with mulch to avoid initiating severe sheet and gully erosion.

## **Road Related BMPs**

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1. **Maintenance of Roads** - Existing and newly constructed roads are maintained throughout the life of the project to insure that drainage structures (culverts, rock crossings, rolling dips, etc.) are functioning correctly, and that concentrated surface run-off does not occur. Drainage control structures will receive maintenance prior to winter shutdown of project operations.
2. **Road Reconstruction** - Drainage structures shall be incorporated into each road design. Erosion control practices shall be implemented during the reconstruction of existing roads. Maintenance shall also be done prior to the winter shutdown of project operations. Runoff from road prisms must be discharged frequently enough to avoid erosion or overtopping of roadside ditches. Drainage from the road prism and associated ditches shall be discharged into buffer strips (or scattered slash piles) where its energy can be dispersed and sediment can drop out before reaching the natural drainage system. Improve or correct installations of rolling dips, stream crossings, and culverts. Extend and enlarge, as needed, the raised portion of water-bars on the uphill side of the road to insure all flow from ditches or drainages is diverted across the road.
3. **Long Term Road Closures** – Except where administrative access is needed, closed roads will be disguised or blocked and in some instances signed to traffic or lightly scarified and

reseeded with an erosion control seed mix of primarily native species. Road berms located lateral to the roadbed will be removed and ruts will be filled in. Drainage will be maintained and improved as needed to prevent erosion. Due to the road surface condition being depressed on some existing roads, water-bars of enough size to either remove the water from the road or with enough storage to prevent run-off from returning to the road will be installed. All connected disturbed areas (CDA): high runoff areas like roads, skid trails, mines, burns, or highly compacted soils that drain directly into the stream system will be disconnected from stream systems. Road closures are to be completed by the contractor as specified in the project implementation plan or planned with other sources of funding. Where necessary, scarify, reseed and camouflage the road entrance with rocks and slash to improve the road closure. Wing fence construction may be necessary in some cases to effectively prevent new resource damage from vehicles attempting to drive around closures.

### **Noxious Weeds Related BMPs**

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1. Survey for noxious weeds in treatment units at a time when the growing season is well established, and prior to treatment implementation.
2. If noxious/invasive weed populations are identified prior to implementation, avoid WUI treatment in the area until noxious weeds are eliminated, or avoid the site occupied by the weeds. Monitor the site for a minimum of three growing seasons post weed-treatment to determine success of eradication.
3. If noxious/invasive weeds are identified during or post implementation, treat the weeds and monitor the site for a minimum of 3 growing seasons to determine weed-treatment success.
4. If noxious/invasive weeds are identified within a treatment unit while treatment is occurring, equipment will be cleaned and inspected before moving to another treatment unit.
5. Any fills, mulches, or re-vegetation seeding, used during or after project implementation will be certified weed free.
6. The Forest Service will be notified prior to each piece of equipment entering the National Forest. Notification will include the location of the equipment's most recent operations.
7. Ensure that all contract equipment moved onto the National Forest is free of soil, weeds, vegetative matter or other debris that could harbor seeds. Inspect each piece of equipment to ensure cleanliness, prior to entering the National Forest.
8. Highly disturbed areas with significant bare ground will be reseeded using native seed to re-establish perennial plants.
9. Seeding will be considered if natural re-vegetation of ground cover species does not occur rapidly enough to protect and area from erosion.

10. Minimize soil disturbance by limiting the extent of the area traveled by vehicles and by avoiding areas with wet soils.

References:

Parsons, Annette. 2003. "Draft Soil Burn Severity Definitions And Mapping Guidelines". Remote Sensing Applications Center, Unpublished Report. 12pp.

## APPENDIX C

### MONITORING SUMMARY

Monitoring will be accomplished as part of implementation of the proposed action. Monitoring activities are accomplished through routine examination and accomplishment reporting channels already in place. Those pertinent to the proposed action include the following:

- Annual reforestation and timber stand improvement report
- Monthly timber sale accounting reports
- Annual Management Attainment report
- Contract administrator inspection reports
- Contract inspector compliance reports
- Contracting Officer's Representative accomplishment and inspection reports
- Engineering Representatives inspection reports
- Post-harvest stand examinations and fuels monitoring
- Annual Forest Monitoring Report
- Periodic Forest and District Management Reviews
- Annual silviculture accomplishment report
- Road inventory and condition reports
- Seasonal threatened, endangered and sensitive species occupancy surveys
- Oversight field reviews by resource specialists and program managers
- Annual aerial insect and disease detection survey
- Recreation/fuelwood/resource protection law enforcement patrols
- Public safety & road closure compliance patrols
- Annual GIS layer updates
- Annual co-op fund balance reconciliations
- Bi-annual employee/supervisor performance reviews
- Annual assessment of water quality accomplishment report
- White Mountain Stewardship Multi-party Monitoring report

In addition, specific additional monitoring associated with this proposal are:

- a). In conjunction with post-treatment surveys, examine disturbed areas for invasion by noxious weeds. Consult with zone pest management specialists on needed action if problems are detected. The District Silviculturist in conjunction with the Range Staff is responsible for this activity.
- b). Visit roads closed under this proposal approximately one year following implementation to determine effectiveness. The Staff in charge of roads is responsible for this review.
- c). Conduct implementation and effectiveness monitoring for Best Management Practices. The contract administrator or the contracting officer's representative for service contracts is responsible for this review. Results will be forwarded to the Forest Soil Scientist for inclusion in his annual report to ADEQ.