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Forest
Service

Southwestern
Region

Four Forest Restoration Initiative Draft Proposed Action Scoping Report

June 2011



Coconino and Kaibab National Forests, Coconino County



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Introduction

Overview

The Four Forest Restoration Initiative (4FRI) is an effort designed to improve forest resiliency and function across four Arizona National Forests, the Coconino, Kaibab, Apache-Sitgreaves and Tonto (figure 1). Due to the size of the landscape involved with four forests, at least two environmental analyses will be conducted. The first environmental analysis focuses on the Coconino and Kaibab forests.

The Forest Service is preparing an environmental impact statement (EIS) that proposes to conduct restoration activities on approximately 600,000 acres on the Coconino and Kaibab National Forests (figure 1). Restoration actions include vegetation thinning, prescribed burning, spring, seep and ephemeral channel restoration, temporary road construction (and decommission), road reconstruction, and closed and unauthorized road decommission and obliteration. Activities would be focused on the Flagstaff district with fewer acres included on the Mogollon Rim and Red Rock districts of the Coconino National Forest. On the Kaibab National Forest, activities would occur on the Williams and Tusayan districts (figure 2). The North Kaibab district is not part of this analysis. Approximately 361,379 acres of the Coconino and 236,020 acres of the Kaibab would receive some type of restoration treatment.

The objective of the project is to re-establish forest structure, pattern and composition, which will lead to increased forest resiliency and function. Resiliency increases the ability of the ponderosa pine forest to survive natural disturbances such as insect and disease, fire and climate change (FSM 2020.5). This project is expected to put the analysis area on a trajectory towards comprehensive, landscape-scale restoration with benefits that include improved vegetation biodiversity, wildlife habitat, soil productivity and watershed function.

An EIS is being prepared to analyze and disclose to the public the environmental, social, and economic impacts of conducting restoration actions over a period of approximately 10 years within the National Forest System (NFS) lands administered by the Coconino and Kaibab forests. The EIS will be prepared in compliance with the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality regulations implementing NEPA and other pertinent regulations. The Draft Environmental Impact Statement (DEIS) is expected to be published for review in late fall of 2011 and the Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) is expected to be available in the spring or summer of 2012.

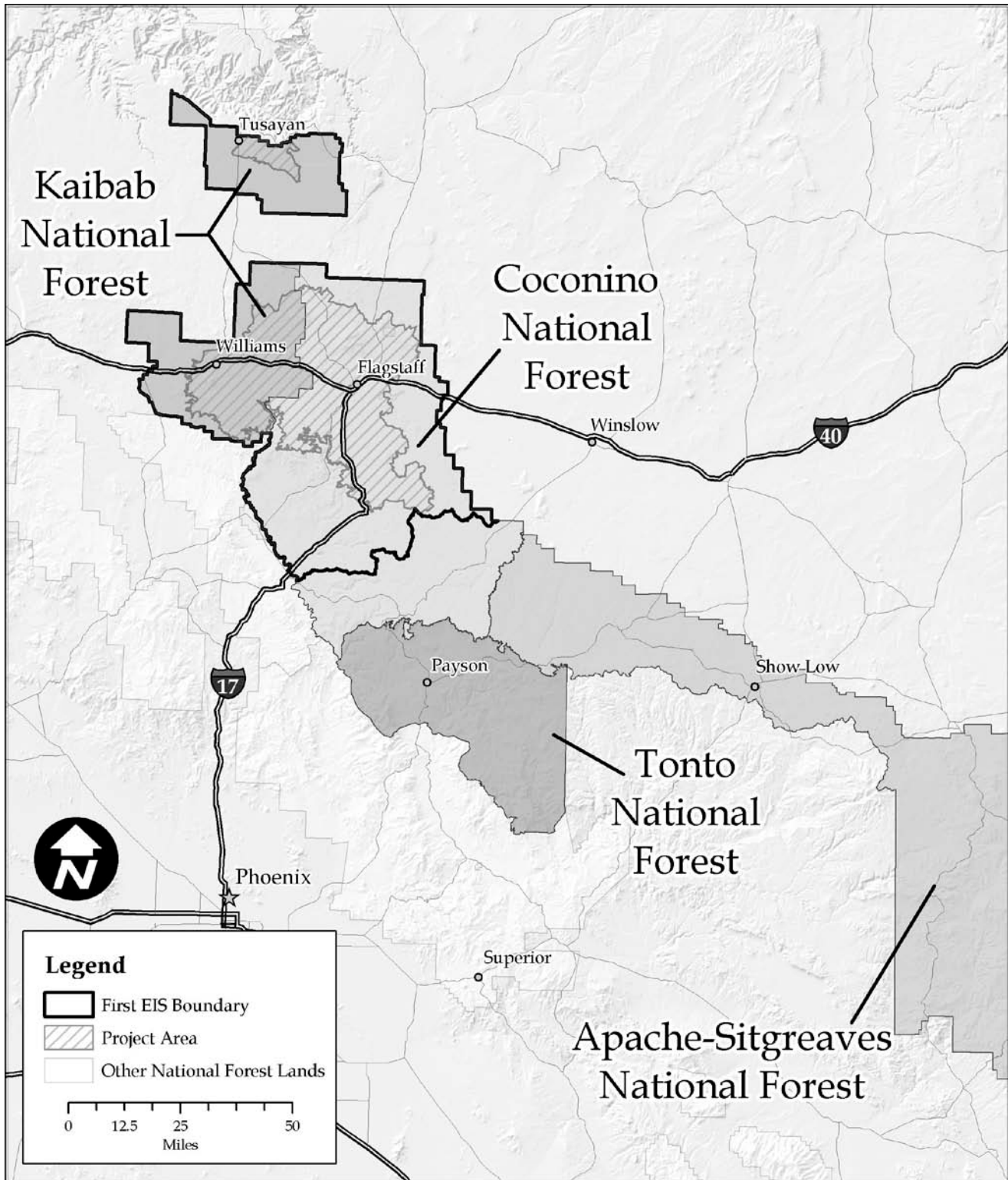


Figure 1. Forests within the Four Forest Restoration Initiative (4FRI)

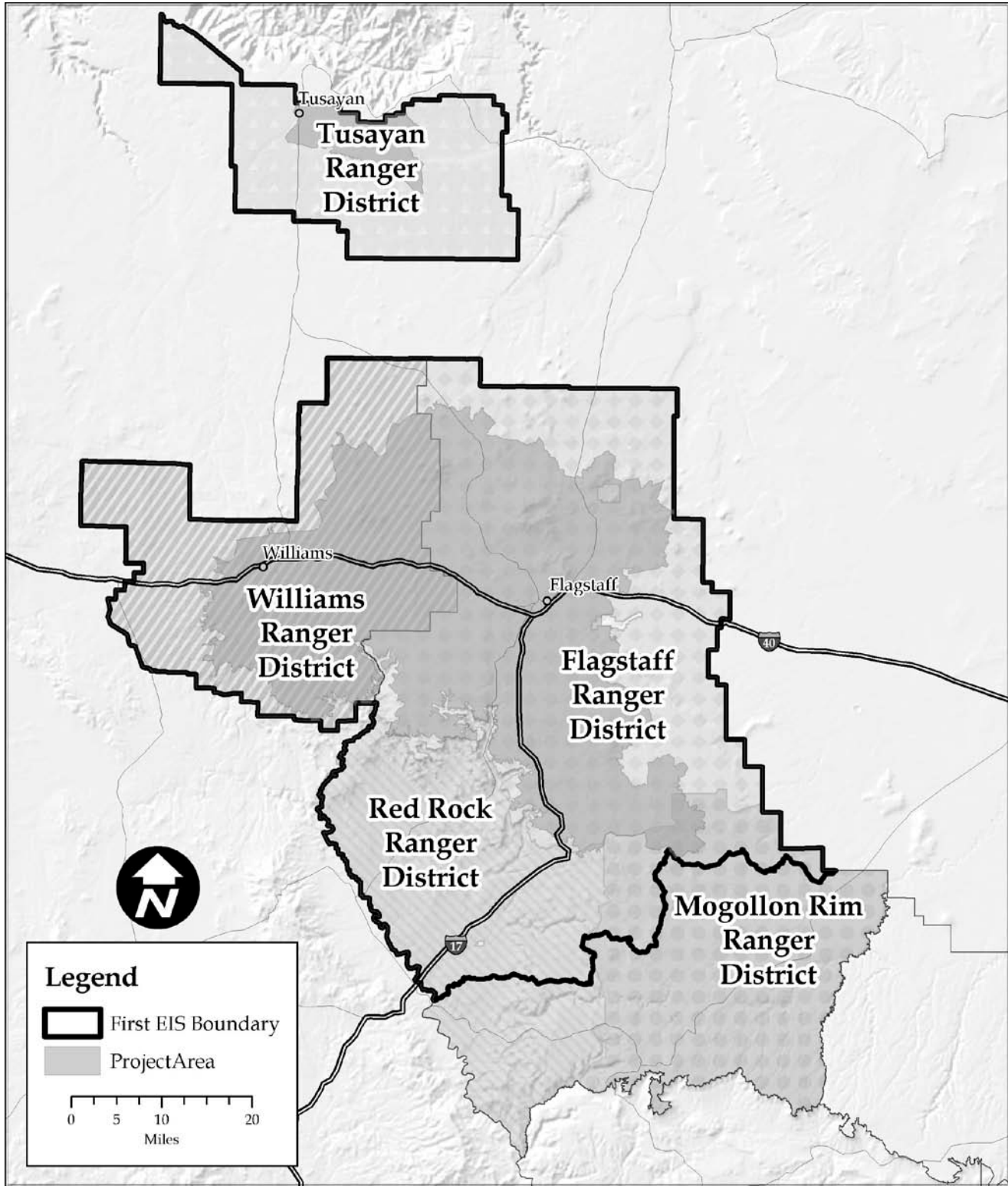


Figure 2. Coconino and Kaibab Ranger Districts within the first analysis (EIS)

Planning Area

Background

The Four Forest Restoration Initiative (4 FRI) is a result of several years of planning and collaboration between individuals, organizations, State and local governments, State and Federal agencies. In 2007, the Arizona Forest Health Council completed the *Statewide Strategy to Restore Arizona's Forests*. The strategy's vision is to integrate knowledge and experience from science, community collaboration, and economics to identify the steps needed to take to increase the rate and effectiveness of forest restoration across Arizona.

Based on recommendations within the strategy, the *Analysis of Small Diameter Wood Supply in Northern Arizona* report was completed in February of 2008. This process built a level of "social agreement" on how much, where, and under what basic parameters mechanical thinning, as one restoration tool, could be used to accelerate restoration of the 2.4 million acre ecosystem.

Also in 2008, the Kaibab National Forest (KNF) launched *The Kaibab Forest Health Focus*, a science-based, collaborative effort to guide future landscape-level forest restoration efforts.

In 2009, Title IV of the Omnibus Public Land Management Act authorized funding for the Collaborative Forest Landscape Restoration Fund (CFLR) to support landscape scale restoration on National Forest System lands for the purposes of reducing uncharacteristic wildfire and associated management costs, supporting local and collaborative partnerships, supporting monitoring of restoration efforts and for utilizing forest products to support communities and offset treatment costs.

In an effort to further engage these collaborative efforts and secure necessary assistance, the Forest Service created a task group to work with the Forest Health Council. The purpose of the task force was to identify alternative approaches to accelerating forest restoration in Northern Arizona. In an effort to move from further study into on-the-ground implementation as quickly as possible, a group of stakeholders representing over forty individuals, State and Federal agencies, local governments, and four National Forests in Northern Arizona including the Coconino, Kaibab, Apache-Sitgreaves and Tonto and the Southwestern Regional Office, moved forward with the Four Forest Restoration Initiative" (also known as 4 FRI). The Initiative received funding via CFLR in 2010.

In 2010, stakeholders and the Forest Service began refining the vision for ponderosa pine forest restoration across 2.4 million acres on four National Forests in northern Arizona: the Apache-Sitgreaves, Coconino, Kaibab, and Tonto National Forests. A sub-group of the 4FRI stakeholder group developed a comprehensive restoration strategy for the Coconino and Kaibab forests. A landscape strategy was created documenting existing conditions, identifying potential treatment areas and desired post-treatment conditions. The Forest Service used the landscape strategy to inform the purpose and need and proposed action. In January of 2011, public meetings were initiated to gather comments that would inform the development of the proposed action. A 45-day comment period was initiated with the publication of the draft proposed action in the Federal Register on January 25, 2011. Comments on the proposal were accepted from January through April of 2011.

Location

The 988, 932 acre analysis area is located on the Williams and Tusayan districts of the Kaibab National Forest and on the Flagstaff, Mogollon Rim and Red Rock districts of the Coconino National Forest (figure 2). Due to the size of the analysis area (about 1,000,000 acres), the landscape was stratified into six restoration units. A restoration unit (RU) is a contiguous geographic area that ranges from 46,000 acres to 335,000 acres in size. A need for change (vegetation structure, pattern, spatial arrangement, potential for crown fire and high intensity surface fire) has been identified for each RU.

RU 1 and RU 2 includes portions of the Flagstaff, Mogollon and Red Rock ranger districts (Coconino National Forest). RU 1 is generally located south of I-40 and east of I-17 and RU 2 is generally located west of I-17 and south of the Mogollon Rim. RU 3 includes portions of the Williams district (Kaibab National Forest), Flagstaff and Red Rock districts (Coconino) and is generally located south of I-40 and west of I-17. RU 4 includes portions of the Flagstaff district and the Williams district of the Kaibab National Forest. It is generally located north of I-40 and west of Highway 180. Communities in the vicinity of proposed treatments include Flagstaff, Munds Park, Mormon Lake, Tusayan, and Williams, Arizona (figure 3).

Each RU was further stratified into several sub-units that range from 4,000 to 110,000 acres in size. Both units (RU and sub-units) are based on sixth code watershed boundaries, State and forest transportation systems, and forest administrative boundaries (figure 4).

Although special areas and designations such as the wilderness, research natural areas and Inventoried Roadless Areas (IRAs) occur within the project area, those designations have been excluded from all (including vegetation and fire) treatments.

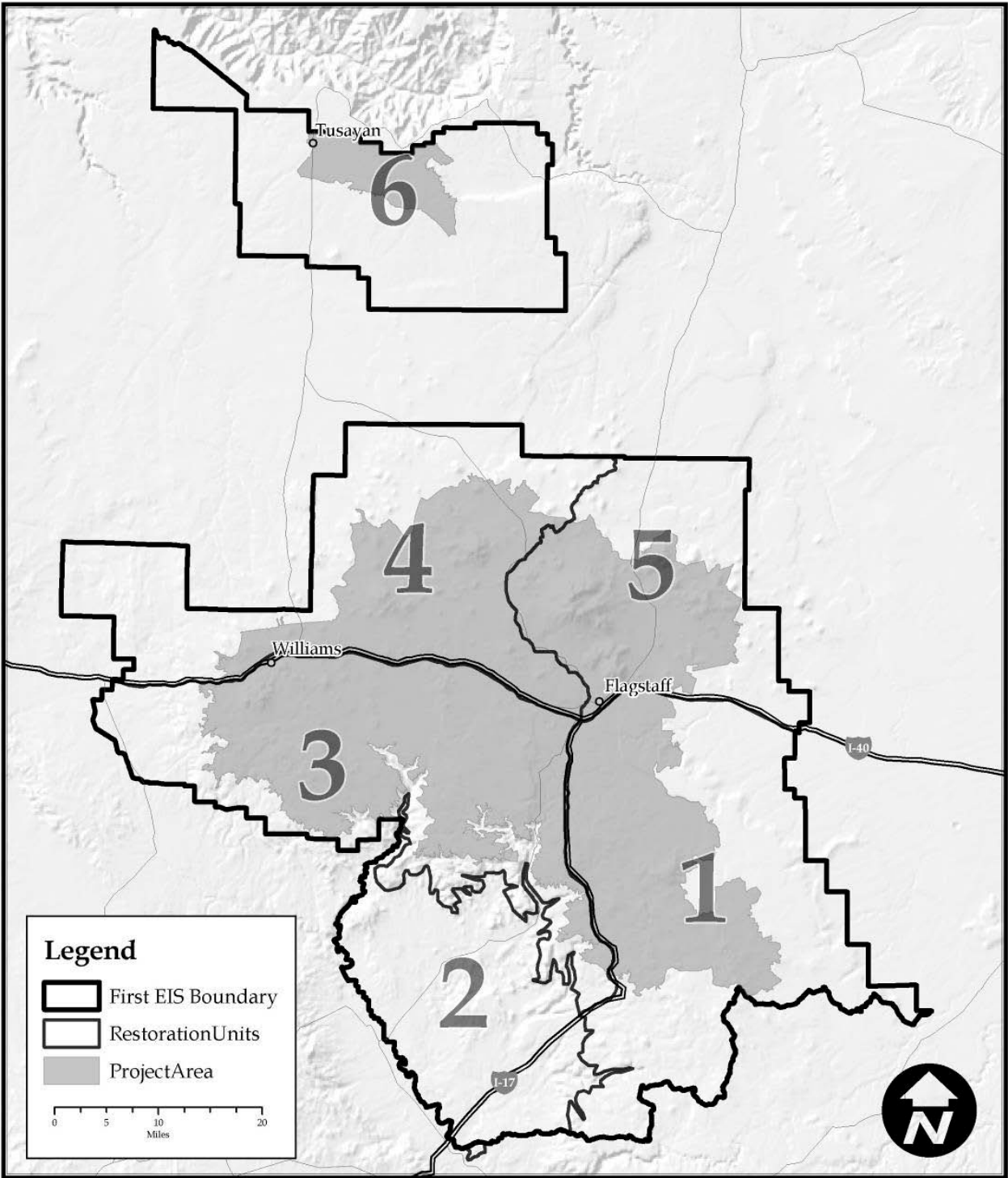


Figure 3. General Vicinity of Restoration Units within the project area

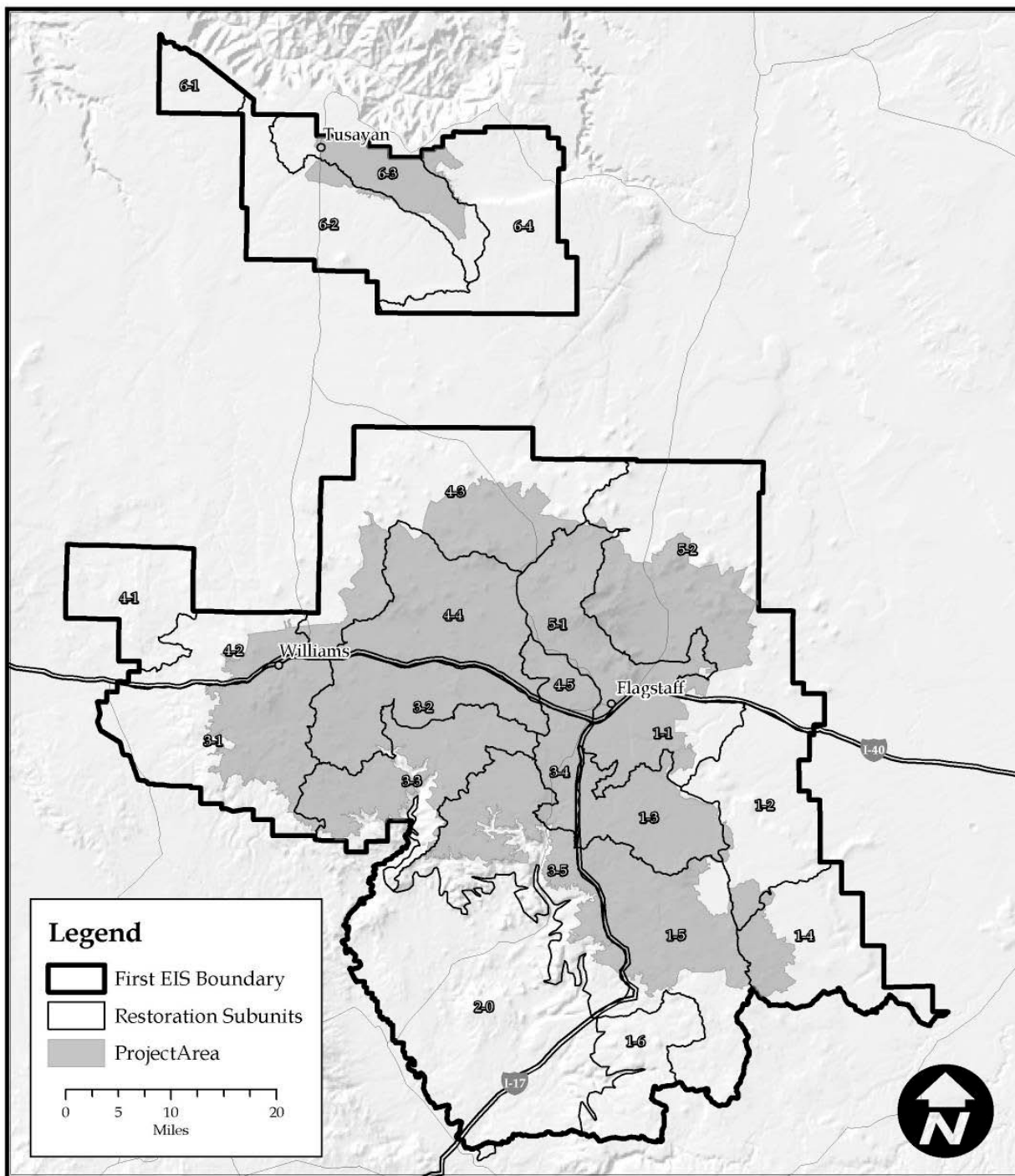


Figure 4. Restoration Sub-units within the project area (based on 6th code HUC)

Scoping Process

This section describes the objectives of the scoping process and the scoping process, itself. It identifies the techniques that were used to notify the public about the opportunity to be involved in scoping and gives a brief summary of the public scoping meetings.

Scoping Objectives

Scoping is an integral part of environmental analysis. Scoping includes refining the proposed action, determining the responsible official and lead and cooperating agencies, identifying preliminary issues, and identifying interested and affected persons. Effective scoping depends on all of the above as well as presenting a coherent proposal. The results of scoping are used to clarify public involvement methods, refine issues, select an interdisciplinary team, establish analysis criteria, and explore possible alternatives and their probable environmental effects (FSH 1909.15_11).

The following direction on scoping from the CEQ regulations applies to the preparation of an EIS: “There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process shall be termed scoping. (a) As part of the scoping process the lead agency shall:

- (1) Invite the participation of affected Federal, State, and local agencies, any affected Indian tribe, the proponent of the action, and other interested persons (including those who might not be in accord with the action on environmental grounds), unless there is a limited exception under §1507.3(c). An agency may give notice in accordance with §1506.6.
- (2) Determine the scope (§1508.25) and the significant issues to be analyzed in depth in the environmental impact statement.
- (3) Identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (§1506.3), narrowing the discussion of these issues in the statement to a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere.
- (4) Allocate assignments for preparation of the environmental impact statement among the lead and cooperating agencies, with the lead agency retaining responsibility for the statement.
- (5) Indicate any public environmental assessments and other environmental impact statements which are being or will be prepared that are related to but are not part of the scope of the impact statement under consideration.
- (6) Identify other environmental review and consultation requirements so the lead and cooperating agencies may prepare other required analyses and studies concurrently with, and integrated with, the environmental impact statement as provided in §1502.25.

(7) Indicate the relationship between the timing of the preparation of environmental analyses and the agency's tentative planning and decision making schedule. (40 CFR 1501.7)

Description of Scoping Process

Federal Register

The Notice of Intent (NOI) to prepare an environmental impact statement (EIS) was published in the Federal Register on January 25, 2011. The NOI, which formally initiated the scoping process, referenced the 45-day public comment period as being January 25 to March 11, 2011. The NOI was published three days earlier than expected (expected date was January 28, 2011); therefore, the official public comment was extended through March 14, 2011. However, comments were actually accepted through April 20, 2011 - approximately 1 month past the close of the official 45-day scoping period. The NOI also included dates for a series of public scoping meetings/workshops hosted by the forests.

Public Meetings

Prior to the publication of the NOI in the Federal Register, a pre-scoping public meeting/workshop was held on January 20, 2011. Meetings/workshops were again held on the Coconino National Forest on February 2, 2011, February 16, 2011 and February 24, 2011. A meeting/workshop was held on Kaibab National Forest on February 9, 2011. The purpose of these meetings was to receive comments that would be used to refine the proposed action. The sixth public meeting was held at the Coconino National Forest Supervisor's Office on April 27, 2011 for the purposes of providing a project progress and status update. The seventh public meeting was held on June 7, 2011 for the purposes of discussing comments that had been received on the draft proposed action.

Distribution of the Draft Proposed Action

On January 25, 2011, the draft proposed action was sent to a mailing list (hard copy and electronic mail) of 1,331 individuals, local and State governments, Federal and State agencies and organizations (see Tribal Consultation below). Fifty-five (55) responses were received through May 5, 2011. Responses include letters, electronic mail and comments received at public meetings.

Forest Internet Web Posts and Media Announcements

Notices regarding the meetings were continuously posted on the Four Forest Restoration Initiative portion of the Kaibab website beginning in January of 2011. Meeting notices were published in the *Verde Independent* on January 15, 2011 and the *Arizona Daily Sun* (newspaper of record) on January 19, 2011 and February 4, 2011. A news release addressing the scoping comment period and public meetings was posted in the *Arizona Independent* (Williams, Arizona) on February 1, 2011. A news release announcing the April 27, 2011 public meeting was posted to the forest's website on April 21, 2011 and distributed to local media. On June 2, 2011, a news release announcing a June 7, 2011 public meeting to be held at the Coconino National Forest was posted on the forest's website and released to local media. Although scoping began in January of 2011,

information on 4FRI was published in Arizona newspapers, including the *Arizona Republic*, as early as November 21, 2010.

State and Federal Agency Involvement

Throughout the scoping period, the 4FRI interdisciplinary team met with interested parties and agencies including the 4FRI stakeholders, Arizona Department of Game and Fish, Arizona Department of Air Quality and the United States Fish and Wildlife Service to discuss the proposed action. On March 11, 2011, Arizona Game and Fish Department (AGFD) was designated cooperating agency status.

Collaborative Planning

To integrate public comment, the Forest Supervisor's designed the analysis to allow for public review of draft documents throughout the process. For this reason, the proposed action as presented in January of 2011 was in draft form. Comments provided at the public meetings from January to June of 2011 were used to further refine the draft proposed action. A final proposed action will be released with a request for comments and documents drafted for the Draft Environmental Impact Statement (DEIS) will be available for review prior to the official release of the DEIS.

Other Public Involvement Efforts

Since the week of May 25, 2011, the interdisciplinary team has hosted office hours (two-hour increments for each specialist) each week to provide an opportunity for interested parties to ask questions, view data and have a general discussion with the resource specialists.

Tribal Consultation

Consultation began approximately 8 months (May 5, 2010) prior to the release of the draft proposed action (January 28, 2011) with preliminary information being sent to those Tribes in the immediate vicinity of the project including the Hopi, Zuni, Hualapai, Yavapai-Apache, and Navajo and Yavapai-Prescott. From June 29th to March 7, 2011, seven informational presentations were made to the Tribes. On January 27, 2011 the forests sent a separate consultation letter providing information and seeking involvement and comments to eighteen Tribes and Tribe Chapters including the Hopi, Navajo, Hualapai, Zuni, Pueblo of Acoma, Yavapai-Prescott, Yavapai-Apache, Ft. McDowell Yavapai, Tonto Apache, White Mountain Apache, San Carlos Apache, Havasupai. The proposal was also sent via e-mail to the Hopi, Navajo, Yavapai-Prescott, Ft. McDowell Yavapai, Hualapai, Havasupai, White Mt Apache, Yavapai-Apache, and Zuni. Two written responses were received. The White Mountain Apache responded on February 17, 2011 and indicated no concern. A response from the Havasupai Tribe on March 7, 2011 asked for additional information on what the expected outcome of the proposals would be. As a follow-up, a meeting was held with the Havasupai Tribal Council and Tribal Elders on March 7, 2011 to discuss the analysis proposal. The forests met with the Hopi Tribe on June 22, 2011 to discuss the project survey strategy. No additional comments were received as a result of meetings or correspondence.

Draft Proposed Action Comment Summary

Comment Compilation

All comments were organized, reviewed, and analyzed to evaluate how the draft proposed action responded to comments and to identify preliminary issues. Each comment was entered into an electronic database system that allows for organizing, sorting, managing and tracking (as applicable) comments through the environmental analysis.

Comment Categorization

The majority of responses are attributed to two sources: letters and electronic responses received as a result of public meetings. The 4FRI electronic comment form, which was available on the 4FRI section of the forest's website, only resulted in the submittal of four comments. Other documents considered as part of scoping content analysis include: (1) Comments and Response to Comments (Appendix A) (1) Stakeholder Landscape Strategy (Appendix B), (2) Stakeholder Treatment Area Portfolio (TAP) 1 and 3 (Appendix C); and, (3) Public Meeting/Workshop notes and comments (Appendix D).

Of the fifty-five (total) comments received, approximately 99% of commenters were residents of the State of Arizona from Coconino, Apache, Navajo, Greenlee, Maricopa or Pima County. The remaining 1% of respondents were from the state of California, Montana or New Mexico. Of the total comments¹ the breakdown of commenters is as displayed below. Please note, more than one letter or email was received from several commenters.

Table 1. Summary of Commenters

Total Number of Letters or Emails Received (includes duplicates)	Commenter Category
3	Federal Agencies including Department of Energy, U.S. Fish and Wildlife Service, Bureau of Land Management
2	Tribes including White Mountain Apache, The Hopi Tribe
5	State agencies including Arizona Game and Fish Department, Arizona State Forestry, Arizona Department of Environmental Quality
5	Local governments including the City of Flagstaff and the Eastern Arizona Counties
16	Organizations including Greater Flagstaff Forests Partnership, Four Forest Restoration Initiative Stakeholders, Friends of Anderson Mesa, Grand

¹ Comments from individual 4FRI Stakeholders were disseminated between the various categories.

Total Number of Letters or Emails Received (includes duplicates)	Committer Category
	Canyon Trust, The Nature Conservancy, John Muir Project, Conservation Congress, Center for Biological Diversity and Sierra Club (group letter and individual emails)
22	Individuals or businesses - various
2	Educational and research institutions including Northern Arizona University (NAU) – The Ecological Restoration Institute and School of Earth Sciences and Environmental Sustainability

Comment Categories and Issue Identification

All comments were sorted into the following nine comment categories and very general comment themes were assigned. Because a refined version of the proposed action will be sent out for public comment, a second content analysis will be conducted. At that time, issues will be identified as well as alternatives that will be analyzed in the EIS. Issues and alternatives will not be developed until comments on the refined proposed action (additional scoping/comment period) have been received. The general category of comments received on the draft proposed action include:

- Proposed Action (protection of old trees, large trees, range and intensity of silvicultural treatments, use of soils to inform treatments, ability to move towards desired conditions that include restoring fire to a resilient landscape, identification of desired conditions and the range of natural variability, placement of treatments that would provide for protection of community and resource values at risk)
- NEPA (type of analysis – programmatic versus site-specific, ability to address site specificity in effects analysis)
- Wildlife (providing for heterogeneity (habitat diversity), providing for species viability, compliance with forest plan goshawk guidelines and Mexican spotted owl requirements)
- Noxious Weeds (mitigation, best management practices, design features)
- Air Quality (compliance with ADEQ regulations, nuisance smoke, quality of life)
- Soils and Watershed (protection of sensitive soils and watersheds)
- General Comments/Support of Project
- Recommended Alternatives to the Proposed Action (burn only, thin up to 8”dbh)
- Outside the Scope (remove grazing from analysis area, wilderness designation)

Next Steps

The refined proposed action will be made available for public comment in July of 2011. Comments received will be categorized, responded to, and issues and alternatives will be developed. All public involvement efforts will be summarized in the Draft Environmental Impact Statement (DEIS).

Appendix A - Four Forest Restoration Initiatives Comments and Responses

January 20, 2011 to April 20, 2011 on Draft Proposed Action

Comment #53-1: Will the refined Proposed Action include a range of mechanical treatment intensities, rather than a focus on high-intensity treatments (as treatment maps currently indicate)?

Response: The refined proposed action includes several types of treatments. In most cases, a range of intensity is nested within each treatment type to provide flexibility in matching the treatment to the on-ground condition. In terms of creating heterogeneity across the landscape, the revised proposed action addresses this through the addition of a range of treatment types that were not present in the original propose action. Most of the “new” treatments have been designed to meet forest plan standards and guidelines for Mexican spotted owl restricted habitat, dispersal northern goshawk PFA's as well as changing prescriptions to make wildlife corridors functional. The percent of openings would range 10% to 25%, 25% to 40% and 40% to 55% with adjustments made for wildlife corridors and soil characteristics.

Heterogeneity would also be accomplished by the pattern and size of groups and gaps, the structure (VSS) of tree groups and the density of each tree group. There are currently five treatment types in northern goshawk foraging areas that include un-even aged (UEA), intermediate thinning (IT), stand improvement (SI), savanna, and grassland (GL) restoration. There are three treatment types in goshawk PFAs including UEA, IT, SI and 1 treatment type (pine/sage) that is specific to Tusayan. There are two small scale treatment types for aspen, seeps and springs. There are four Mexican spotted owl (MSO) treatment types specific to PACs, threshold, target and restricted habitat. There are no treatments areas within MSO PACs and general no treatment areas. Fire treatments would add additional heterogeneity to the landscape.

Comment #53-2: How does the Forest Service plan to measure canopy cover in VSS 4, 5, and 6 stands in accordance with current forest plan direction?

Response: Habitat attributes will be displayed in the effects analysis within the DEIS and will be based upon forest plan requirements within the Coconino and Kaibab National Forest Plans. Percent canopy cover in goshawk foraging habitat will be evaluated at the group level for VSS 4, 5 and 6 groups and will be 40%+ in foraging areas and 50%+ in goshawk PFAs. A project area wide canopy cover assessment will be used to disclose the existing condition at the stand (stand sizes range from approximately 5 acres to 300 acres) and treatment area (treatment areas range from 5,000 to 20,000 acres) level. A forest plan amendment variance would be proposed on approximately 19,234 acres of the Kaibab and 28,344 acres of the Coconino to reflect managing canopy cover between 10% and 30% in goshawk foraging habitat.

Comment #53-3: What approach does the Forest Service plan to use in order to strategically locate treatments with the goal of changing fire behavior, and what assumptions will be associated with that approach?

Response: Fire priorities are included across the entire analysis area. The fire prioritization matrix was described and presented at the public meeting on April 27th. The prioritization process combines fireline intensity, crown fire, and slope to zero in on those areas most at risk in the event of fire under conditions that can occur every year (Schultz), rather than using the broader brush of high weather percentiles. Focusing on the most at risk areas is an effective way to begin restoration (Hood, 2010) with the use of fire intensity as a measure. As noted by Van Wagner (1977), "...fire intensity thus conceived contains about as much information about a fire's behavior as can be crammed into one number."

Crown fire is high intensity fire though, technically it could burn just in the crowns (as independent crown fire, though that is rare). Additionally, high intensity surface fire frequently produces flame lengths high enough to lethally scorch the crowns of trees, often producing large areas of 100% mortality, though there was no crown fire. Narrowing down those areas identified as fire priorities to those most at risk allows us to minimize the acres mechanically treated, rather than painting with a broader brush that might indicate much larger acreage/s in need of mechanical treatments. The 'high' fireline intensity represents ~20' flame lengths, sufficient to cause at least spotty mortality. The 'Very High' intensity represents 50 feet and greater flame lengths, likely to cause 100% mortality, even if there is no crown fire indicated. Additionally, passive and active crown fire was included. If any of these fire behaviors occurred on slopes <40%, they were given additional weight (regarding need for treatment).

In response to comments received at the April 27th 2011 public meeting, soils that are at high risk of erosion were added to the prioritization process. Having a high risk of erosion generally means there is combination of the soil texture and slope. Focusing on the most at risk areas is an effective way to begin restoration (Hood 2010) using fire intensity as a measure. As noted by Van Wagner (1977), "...fire intensity thus conceived contains about as much information about a fire's behavior as can be crammed into one number." Additional modeling using the fire path program will be conducted to evaluate the site-specific risk to key resources (such as MSO PACs, Lake Mary Watershed). See handout on prioritization process.

Comment #53-4: Is the refined proposed action likely to result in any forest plan amendments?

Response: The proposed action includes the following forest plan variances:

(1) A forest plan amendment would be proposed on both the Kaibab and Coconino forests to remove some acres from the timber suitability base. There are acres on the Kaibab and Coconino that are currently part of the suitable timber base would become classified as non-suitable with a wildlife emphasis as a result of savannah and grassland restoration treatments. The objective is to move towards desired conditions and manage these acres as open ponderosa pine stands (via savannah treatments) into the future.

(2) A forest plan amendment would be proposed in order to mechanically treat up to 18 MSO PACs greater than 9" dbh and less than 16" dbh on the Coconino National Forest in order to improve owl habitat structure while reducing the risk of crown fire and high intensity surface fire.

(3) A forest plan amendment would be proposed to reduce the residual canopy cover from 40% in approximately 28,344 acres of goshawk foraging and dispersal PFA habitat on the Coconino NF to a range of 10% to 30%. A forest plan amendment would be proposed on the Kaibab National Forest to reduce the residual canopy cover from 40% in 19,234 acres of goshawk foraging and dispersal PFA habitat to a range of 10% to 30%.

(4) A plan amendment would be proposed to provide for a variance from the 10K block of analysis for wildlife forage (HCI), hiding and thermal analyses on the Coconino National Forest. The scale of analysis for hiding and thermal wildlife cover would be conducted at the stand to sub-unit scale (5,000 to 50,000 acres) as the 10K unit is meaningless for this project. The 10K unit was designed to be used as a surrogate as a means to get to a landscape scale of analysis. Using a 10K unit of measure for this analysis would be too small to use for building up to the ecosystem scale. A key assumption in using the 10K unit was if objectives are being met at the 10K scale, objectives were being met at the larger scale. Analysis for wildlife forage (HCI) would be conducted at stand to sub-unit scale (5,000 to 50,000 acres).

No plan amendment would be needed for the following: (1) No forest plan amendment is needed for the scales of analysis needed to meet forest plan requirements for old growth. What scale equates to an ecosystem management area (EMA) on both forests would be disclosed as well as what constitutes one scale above and one scale below the EMA; (2) No forest plan amendment is needed to meet forest plan scale of analysis requirements for canopy cover, VSS, log and snags in goshawk habitat. What scale equates to an ecosystem management area (EMA) on both forests would be disclosed as well as what constitutes mid scale and small scale; and, (3) No plan amendment is needed to deviate from the 10K analysis on the Kaibab. References to 10K include "approximate" and the plan states standards and guidelines should be applied on an assessment area basis. All scales of analysis would be disclosed:

Scales of Analysis Reviewed by Kaibab and Coconino Forest Planners and Approved by Forest Supervisors:

Old Growth

- Small – stand/site (stand size averages 100 acres)
- EMA – Sub-Unit (formerly labeled a treatment unit within the firescape. Sub-units range from 4,000 to 109,000 acres);
- Scale above the EMA – Restoration Unit - formerly referred to as a firescape with size ranging from 50,000 acres to 200,000 acres),

An additional landscape scale of analysis would be added – 4FRI ponderosa pine analysis area since we are addressing an entire vegetation type

Northern goshawk Scales of Analysis for Canopy Cover, VSS, logs and snags

- Small scale of site = site/stand,
- EMA - Subunit - here would be 4 to 5 units per Subunit
- Mid Scale - EMA on Kaibab and up to 5 subunits on the Coconino (deviation from 10K block analysis)
- Large Scale - Restoration Unit – up to 200,000 acres
- Landscape Scale – Analysis area (ponderosa pine type)

Comment #53-5: In the goshawk guidelines (which the FS is using to develop treatments for the 4FRI project), the FS states 'implementation of the goshawk guidelines will result in forest landscape restoration (structure, patterns, and species composition within the historic range of variability of natural forest conditions)'. However, I have not seen a description of what the historic range of variability of natural conditions actually is, and more importantly what are the attributes, parameters, and science that are being utilized to develop that historic range of variability as it relates to implementation of the goshawk guidelines? Even if you discount the goshawk guidelines, what is the FS using as HRV and how did it determine the HRV it is using to develop its 4FRI restoration objectives?

Response: The project background and purpose and need have been refined to include additional best available science information and references to HRV.

Comment #53-6: How will the refined Proposed Action emphasize the objective of safely re-establishing natural fire regimes at landscape scales?

Response: The proposed action has been designed to meet the purpose and need of moving towards re-establishment of fire regime reference conditions (FRCC 1) and reducing the risk of crown fire and high intensity surface fire. The term “safely” continues to be confusing. Safely to the interdisciplinary team refers to reducing the potential for negative impacts or loss to values at risk that include biological resources (habitat, features that are rare or unique across the landscape) as well as socio-economic resources such as communities and aesthetics. How this project would influence the management of fire into the future (opportunities for managing unplanned ignitions) would be addressed in the fire effects analysis.

Regardless that this project is at the landscape scale, thinning and burning would occur in distinct and discrete segments. This is no different than how the Coconino and Kaibab currently implement prescribed fire. In order to safely apply fire, burn plans are developed which outline criteria designed to protect resources and the public.

Regarding the re-establishment of fire at the landscape scale, a Joint Fire Science project, *Mitigating Old Tree Mortality in Long-Unburned, Fire-Dependent Forests: A Synthesis* that was published in June of 2010 speaks to treatment at the landscape scale. Hood (2010) found, that “...Focusing on the most at risk areas is an effective way to begin restoration... Restoring a natural fire regime can result in a heterogeneous landscape with multiple stands conditions that are likely to provide suitable habitat for a wide range of species. Focusing on just a small project area can be contentious and may make it hard to justify potentially adverse treatment impacts on threatened or endangered species. Planning restoration treatments on a landscape-scale can restore a frequent fire regime, while allowing for areas of denser stands and differences in fire severity in order to provide diverse structural conditions”.

Comment #53-7: How will the refined Proposed Action describe restoration as a corrective step to re-establish self-regulating forests rather than another step in an ongoing system of silvicultural management?

Response: Regarding fire, the desired condition is for the landscape to be in a condition such that, when there are natural ignitions, the choice of how to manage them can be based on something other than the potential for unnaturally severe effects and/or unacceptable risks to resources/life/homes/property from potential fire behavior/effects. Our initial treatments, both fire and mechanical, would address unnatural conditions in the forest that affect fire behavior. After

mechanical treatments and the first two burn entries, we expect forest to be in a state where they could be managed with fire. That does not mean they will be or that they have to be. Other natural disturbances (such as insect and disease outbreaks) could result in a change in conditions across the landscape. The intent is to move towards resiliency and mitigate the risk posed to people and resources by the current condition of the project area.

Comment #53-8: Will the refined Proposed Action state and respond to the stakeholder objective of implementing mechanical treatment across 50,000 strategically-located acres per year for 20 years as measured across the entire 2.4 million acre analysis area?

Response: This analysis (analysis area is approximately 988,932 acres) addresses treating via mechanical treatment (386,837 ac.) and prescribed burning (210, 563 ac.) up to 597,400 acres over a 10-year period on the Coconino and Kaibab National Forest. What the proposed acres for restoration activities on the Tonto and Apache-Sitgreaves NF is unknown at this time. Regarding the desire to implement 50,000 acres per year, the mechanical treatment acres for this analysis does not reflect other acres that could be included in a contract as other vegetation management NEPA decisions have been made on both forests.

Comment #53-9: Will the refined Proposed Action state that its actions will comply with the MSO recovery plan and not result in new take until and unless re-consultations allowing more take have been completed?

Response: The proposed action has been designed to meet forest plan requirements (means that the recovery plan requirements are met) for threatened and endangered species. Any specific need for a forest plan amendment to deviate from current forest plan standards for MSO has or will be identified and analyzed in the EIS. Consultation with USFWS is a required element for this analysis.

Comment #53-10: How will the refined Proposed Action identify strategically-placed restoration treatments that safely re-establish natural fire regimes at landscape scales, building on the Landscape Strategy and its Treatment Area Portfolios?

Response: The IDT reviewed the landscape strategy and the treatment areas portfolios (TAP) to evaluate how similar or dissimilar the refined proposed action was in terms of meeting restoration objectives. The concept of safely re-establishing natural fire regimes is confusing and appears to be limited to how fire is applied at the landscape scale. Also see response # 53-6. TAP 3 was the most complete as TAP 1 was in a very draft form. No TAP was presented for Firescape 4, 5 or 6. See crosswalk appendices.

Regarding fire, we have identified those areas most at risk from high intensity fire. By using Schultz conditions, rather than more extreme conditions (which was used in the landscape strategy). The refined proposed action reflects a focus on those areas most at risk from unnaturally intense surface and crown fire. The proposed action includes specific (and strategic) recommendations for the reintroduction of fire into fire adapted-stands of southwest ponderosa pine that have not had fire for a long time. For example, unnaturally high accumulations of duff can be lethal to trees if they burn up all at once because of the heat that can go into the cambium and roots. Duff consumption is not generally associated with flame lengths, and is not high intensity fire, though it may produce sufficient heat to do significant damage because of its long residence time (Hood 2010). Additionally, flame lengths that result from the burning of surface

fuel loads – litter/coarse woody debris/ slash, may produce sufficient intensity to scorch the crowns of trees sufficiently to cause death, even if there is no crown fire.

Comment #53-11: How will the refined Proposed Action describe Firescapes as a spatial context for designing and deploying strategically-placed restoration treatments to safely manage both planned and unplanned wildland fires?

Response: See response # 53-10

Comment #53-12: How will the refined Proposed Action incorporate the large tree retention and old growth protection strategy?

Response: The stakeholder provided Large Tree and Old Growth Retention Strategy has been reviewed. We concur that old growth trees (pre-settlement) should be retained. An old tree retention strategy has been developed to serve as a guide for the conservation of old (pre-settlement trees). The strategy focuses on retaining old, large trees that are currently under-represented on the landscape as compared to what was present historically. Every effort will be made to conserve old large pre-settlement trees by using characteristics described by Thompson (1940) as age class 3 (intermediate-mature) and age class 4 (mature-overmature). The values associated with old, large trees are different from those associated with large, young trees - a key difference from the stakeholder provided strategy.

Comment #52-1: Email and name change update, No response

Comment #51-1: I do not understand how to link the information provided to the TES number. Is there a cover sheet which explains the linkage?

Response: Table 3 of Appendix A of the soils and watershed report was sent to commenter via e-mail on 3/28/2011. The dominant five TES mapping units in the analysis area were highlighted. The column labeled "Final Strata Comb" in Table 3 includes the TES map units within a given stratum and the footnotes describe which forest the TES map unit occurs on. For example, Stratum 1 includes TES maps unit 6, 9, 11 on the Kaibab... (footnotes 11-13) and TES map unit 53 from the Coconino... (Footnote 14); stratum 2 is a monotypic stratum (so unique as to have only one TES map unit). Stratum 2 contains TES map unit 55 from the Coconino... (Footnote 15); stratum 3 contains TES map units 513 (footnote 16) from the Kaibab...and map unit 595 (footnote 17) from the Coconino...The same process for linking strata to their respective TES units carries throughout the table. Current and potential vegetative production data were not reported since the emphasis is on impacts that restoration treatments would have on soils and watershed conditions - and not forage production which is rangeland management consideration. The emphasis is on natural revegetation potential (table 6) to ensure minimal adverse impacts to the potential for treated areas to revegetate with grasses, forbs, and shrubs (to protect soil surfaces from erosion) following treatments; effective ground cover (rock, vegetation, vegetative litter, and bare soil to understand current ground cover conditions; and plant competition (tables 5 and 6) to provide information to silviculturalists on where plant competition might preclude a treated forest stand from being able to regenerate naturally.

Comment #50-1: The Hopi Cultural Preservation Office supports the identification and avoidance of prehistoric archeological sites and we consider the prehistoric archeological sites to be "footprints" and Traditional Cultural Properties. Therefore, we appreciate the Forest's continuing solicitation of our input and your efforts to address our concerns.

Response: Thank you for commenting.

Comment #50-2: In initial consultation...we have been informed that Appendix J, Standard Consultation Protocol for Large-Scale Fuels Reduction, Vegetation Treatment and Habitat Improvement Projects pursuant to the First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities will apply to these projects....We look forward to continuing consultation with the four forests on the development and implementation of the cultural resources survey plans and Traditional Cultural Properties and ethnographic studies.

Response: Thank you for your comment. Regarding TCPs, we have confirmed that the Red Butte TCP is not within the analysis area. Although no treatments are proposed within the Bill Williams TCP, it will be included in the heritage analysis.

Comment #49-1: We support the overall approach that the Four National Forests...are taking to restore the health and sustainability of forest lands in Arizona. The landscape scale approach will insure that implemented management strategies will not stop at individual forest boundaries and will benefit large scale watersheds, wildlife habitats and scenic landscape.

Response: Thank you for your support.

Comment #49-2: We would encourage that the management strategies being developed consider an all lands approach taking into account adjoining ownership that have a vested interest in the outcome. We recommend that the recently developed Arizona Statewide Assessment and Strategy be used as a guiding document.

Response: Thank you for your comment. We believe we are in alignment with the all lands approach outlined in the Strategy. Specifically, we are collaborative in nature (Ecosystem Health, Goal 1, objectives 1 and 3), are using science-based analysis (Ecosystem Health, Goal 2, objectives 1) and are landscape scale in nature (Arizona Forest Resource Strategy, p 5). How the proposed action, when combined with other activities that have occurred (or could in the near foreseeable future occur) on private and state lands will be part of cumulative effects analysis in this EIS. We have made contact with the State Lands Department regarding 4FRI, but to date, no response has been received. However, this does not preclude having cooperative efforts in the future. In fact, this analysis may provide additional opportunities for the all lands approach.

Comment #49-3: The PA does not specifically address the need for forest industry, but we believe that it is a critical component to the overall success of 4FRI....We believe the Forest Service will need to develop longer term contracts to cultivate forest industry investment.

Response: Thank you for your comment. The project objective will be revised to include the need to attract appropriately sized industry in order to successfully implement the project. Since there are no NEPA decisions to be made in terms of contracting (this is considered to be implementation), the proposed action will not include any actions related to contracting. However, an economic analysis (which will consider potential forest industry) will be part of the EIS.

Comment #49-4: We applaud your goal of reducing the potential for....wildfires, especially where it involves the wildland/urban interface. The landscape approach of 4FRI will be effective over the long run in reducing the fire threat and damage to life, property, infrastructure, and

watersheds. This will also benefit federal, state, and local fire and emergency agencies in reducing fire suppression and post fire mitigation costs.

Response: Thank you for your comment.

Comment #48-1: Restoring our national forests to health after 120 years of abuse is a large and daunting task, one that will take decades to complete. There is no question in the scientific community that addressing livestock grazing impacts on fire and biodiversity must be part of the solution. In light of probable severe budget cuts, it might be more efficient to remove cattle from much of the range for several years. This could permit the grasses to grow & result in restoring the forest without cutting lots of trees, etc. I hope the drafts and final statements will have an economic analysis (benefit/cost).

Response: Thank you for your comment. Removing cattle from the entire analysis area (approximately 1,000,000 acres) is not a reasonable option. Other environmental analyses have been conducted and decisions made to authorize grazing on the Coconino and Kaibab forests. This option would not address the restoration objective which includes much more than cutting trees such as returning fire to the landscape, road decommission and obliteration, spring and stream restoration. Regarding an economic analysis, it will be part of the EIS.

Comment #48-2: I commend the Forest and support the last 6 Proposed Actions dealing with riparian resources and roads.

Response: Thank you for your support.

Comment #47-1: The broad-scale application of rule-based silvicultural treatments...places potential mechanical treatments across a majority of the landscape and is not representative of a more socially acceptable desire to implement strategically placed mechanical treatments across approximately 300,000 acres of the landscape....The PA identifies approximately 656,000 acres of additional .pine forests for mechanical treatments. Based on this acreage alone, this is approximately twice the amount of area that was previously found to be socially acceptable for receiving mechanical treatments...Placement of the mechanical treatments...is not explicitly driven by considerations related to the protection of valuable resources or the creation of a fire-permissive landscape....Concerned that the current amount and placement of mechanical treatments in the PA does not reflect the social license generated over the previous several years and will not be socially acceptable.

Response: Thank you for your comment. The IDT stressed during the January and February 2011 public meetings (and again at the April 27, 2011 public meeting) that the initial proposed treatments had not been refined to be consistent with the forest plan including the application of Mexican spotted owl and northern goshawk habitat requirements. However, the concept of social acceptance for a specific acreage amount is of concern. For this NEPA process, social license is gained through input from all publics including your organization and is social license should be specific to this analysis. Social license is not gained from any other analysis that does not have the same objectives and purpose and need as the 4FRI EIS, and has incomplete analysis (2008 Wood Supply Study, p18). We look forward to working together to create a new social license specific to the 4FRI EIS.

We have reviewed the findings in the 2008 Analysis of Small-Diameter Wood Supply in Northern Arizona analysis, which has been considered a pre-cursor to the Coconino-Kaibab restoration

analysis. The objective of this study was to identify a level of forest thinning treatments and potential wood supply from restoration byproducts. A 20-member working group representing environmental non-governmental organizations (NGOs), private forest industries, local government, the Ecological Restoration Institute at Northern Arizona University (NAU), and state and federal land and resource management agencies was assembled. The focus of this study was on small-diameter trees although wood supply estimates included some trees > 16" dbh where their removal was required to meet desired post-treatment conditions. Note: There was no concurrence within the group that trees over 16" dbh should be cut and removed from areas outside community protection management areas. Although this study was critical in terms of setting the stage for this analysis, the project objective for 4FRI is restoration and omitting restoration actions simply to meet a formerly derived acreage limitation would not meet project restoration objectives.

While the woody supply analysis focused on restoration in terms of addressing fire risk and using mechanical treatments to this end, true restoration must include forest health - stand structure, pattern, and composition. This analysis also includes other restorative actions and opportunities focusing on stream channels, aspen and Gambel oak enhancement (composition), grassland restoration, road decommission and unauthorized route obliteration. Regarding how mechanical and fire treatments are placed to protect resource values, the process used to develop the refined proposed action addresses this concern.

Comment #47-2: The revised proposed action...clarify information for each treatment regarding (1) the size of tree groups and openings, (2) the range of basal areas and tree densities remaining within tree groups; (3) the distribution of tree size classes within groups, stands, and treatment areas; and (4) the range of canopy cover at the group level, stand level, and treatment area level...These structural and spatial descriptions of the forested areas or tree groups would provide the public with a better understanding of the result of mechanical treatments and allow for a more comprehensive analysis of effects of mechanical treatment on wildlife populations and ecosystem processes.

Response: Thank you for your comment. Habitat attributes will be displayed in the effects analysis within the DEIS and will be based upon forest plan requirements within the Coconino and Kaibab National Forest Plans. Percent canopy cover in goshawk foraging habitat will be evaluated at the group level for VSS 4, 5 and 6 groups and will be 40%+ in foraging areas and 50%+ in goshawk PFAs. A project area wide canopy cover assessment will be used to disclose the existing condition at the stand (stand sizes range from approximately 5 acres to 300 acres) and treatment area (treatment areas range from 5,000 to 20,000 acres) level.

Comment #47-3: The Proposed Action should be revised to clearly and unambiguously state that the collaboratively developed strategy will be implemented and operational zed to protect all old growth trees and retain as many large trees as possible across the landscape...The document reflects...on how old growth trees should be protected and large trees should be retained during the implementation of the project. The document identifies the actions that should be taken to protect and retain large trees in almost every situation that would be encountered during the implementation of this project.

Response: The stakeholder provided Large Tree and Old Growth Retention Strategy has been reviewed. We concur that old growth trees (pre-settlement) should be retained. An old tree retention strategy has been developed to serve as a guide for the conservation of old (pre-

settlement trees). The strategy focuses on retaining old trees that are currently under-represented on the landscape as compared to what was present historically. Every effort will be made to conserve pre-settlement trees by using characteristics described by Thompson (1940) as age class 3 (intermediate-mature) and age class 4 (mature-overmature). The values associated with old, large trees are different from those associated with large, young trees - a key difference from the stakeholder provided strategy

Comment #47-4: The revised proposed action...should redistribute mechanical treatments across the landscape for the express purpose of creating a heterogeneous landscape. Currently, the proposed action proposes to treat several large areas of the project area with mechanical treatments that have similar resulting forest structures (e.g., treatments with the same level of residual openings). This current placement of mechanical treatments is likely to create a homogenous forest structure across large swaths of the project areas.

Response: Thank you for your comment. The revised proposed action would increase heterogeneity across the landscape through the integration of the specialist's layers and creating a range of treatment types, including elements that were not present in the original Propose Action. Forest Plan standards and guidelines will be met for Mexican spotted owl (MSO) protected activity centers (PACs), restricted habitat, dispersal post-family fledging areas for northern goshawks as well as changing prescriptions to make functional wildlife corridors. In some cases, redistributing mechanical treatments for the express purpose of creating heterogeneity would not comply with forest plans (MSO protected habitat). However, the refined proposed action is designed to move forest structure towards heterogeneity. This is displayed as a desired condition to move towards/creating an uneven-aged forest structure with all age classes represented and by moving towards restoring grasslands and encroached meadows.

Specifically, 4FRI core team members worked with the AZGFD to design corridors for species like pronghorn that require open habitat and for a suite of species that use closed-canopy habitat. Corridor needs were combined with site ecology to meet the intent of both the corridor and the goal of ecological restoration. The result is corridors that contrast with neighboring stands and creating heterogeneity within "closed corridors."

Similarly, core team members have been working with the USFWS in defining a series of treatments intended to improve MSO PACs which are expected to increase heterogeneity even within PAC habitat. Restricted habitat will be treated differently from non-MSO habitat within the pine-oak forest-type and target and threshold stands will receive treatments that will maintain or enhance heterogeneity within restricted habitat. The FS has decided to avoid mechanical treatment within nest cores and within northern goshawk nest stands, adding additional scales of habitat variability within areas designated for those respective species.

The refined proposed action includes a range of treatment options within each treatment type that are designed to build-in heterogeneity by designing around site-specific forest conditions (site class, quality) to determine the percent opening that is appropriate. For example, the percent of openings would range 10% to 25%, 25% to 40% and 40% to 55% with adjustments made for wildlife habitats and soil characteristics. Another treatment was added to account for pine-sage habitat on the Tusayan District that is different from general ponderosa pine treatments.

As described above, heterogeneity will be achieved within treated areas. In addition, these treatment types will contrast with untreated areas permeating the analysis area, adding

heterogeneity between treated and untreated areas. Existing old growth, steep slopes, other raptor nests, bald eagle roosts, etc., would all add to the overall landscape heterogeneity achieved through the 4FRI. In addition, fire treatments would create additional heterogeneity with their variable results dependent on existing fuels and woody structure.

Comment #46-1: The project objective is to re-establish forest structure, pattern and composition which will lead to increased forest resiliency and function. However, the PA does not define the parameters for those components or the basis for establishing those components.

Response: Thank you for your comment. Additional detail on structure, pattern and composition in terms of moving towards the desired condition of resiliency and function (supporting science) has been included in the refined proposal.

Comment #46-2: We urge that the best available science (including climatic science), combined with natural range of variability (as defined by site characteristics and reference conditions) be used to inform treatment design.

Response: We agree. Site characteristics have been used to inform the treatment area design with the breakdown of openings by site class. Forest plan guidelines for northern goshawk refer to reference area conditions and reference conditions are included in grassland and spring treatments.

Comment #46-3: Clarify where and when mechanical treatments will take place. What criteria will be used to establish priorities? This should be transparent in order to build support. We urge that the ecological attributes that are most difficult to replace (e.g., critical habitat and old-growth trees) receive priority attention. Articulating the process used to establish priorities will be important to explain actions and justify appropriations in the future.

Response: Fire priorities are included across the entire analysis area. The fire prioritization matrix was described and presented at the public meeting on April 27th. The prioritization process combines fireline intensity, crown fire, and slope to zero in on those areas most at risk in the event of fire under conditions that can occur every year (Schultz), rather than using the broader brush of high weather percentiles. Focusing on the most at risk areas is an effective way to begin restoration (Hood, 2010) with the use of fire intensity as a measure. As noted by Van Wagner (1977), "...fire intensity thus conceived contains about as much information about a fire's behavior as can be crammed into one number." Crown fire is high intensity fire though, technically it could burn just in the crowns (as independent crown fire, though that is rare). Additionally, high intensity surface fire frequently produces flame lengths high enough to lethally scorch the crowns of trees, often producing large areas of 100% mortality, though there was no crown fire. Narrowing down those areas identified as fire priorities to those most at risk allows us to minimize the acres mechanically treated, rather than painting with a broader brush that might indicate much larger acreage/s in need of mechanical treatments. The 'high' fireline intensity represents ~20' flame lengths, sufficient to cause at least spotty mortality. The 'Very High' intensity represents 50 feet and greater flame lengths, likely to cause 100% mortality, even if there is no crown fire indicated. Additionally, passive and active crown fire was included. If any of these fire behaviors occurred on slopes <40%, they were given additional weight (regarding need for treatment). In response to the April 27th 2011 public meeting, soils that are at high risk of erosion have been added to the prioritization process. Having a high risk of erosion generally means there is combination of the soil texture and slope. Focusing on the most at risk areas is an

effective way to begin restoration (Hood 2010) using fire intensity as a measure. As noted by Van Wagner (1977), "...fire intensity thus conceived contains about as much information about a fire's behavior as can be crammed into one number." Additional modeling using the fire path program will be conducted to evaluate the site-specific risk to key resources (such as MSO PACs, Lake Mary Watershed).

Comment #46-4: Identify what will be monitored in order to evaluate if treatments are achieving desired outcomes and how it will inform adaptive management...for two reasons: (1) So we proceed using the best available information, and, (2) so that people can support this effort in the face of uncertainty knowing that changes will be made as new information develops.

Response: Thank you for your comment. A monitoring plan is under development. This plan will be shared with the public for comment in the DEIS.

Comment #46-5: Although the proposed action borrows definitions and language from the Forest Service handbook definition of ecological restoration a definitive statement of commitment to ecological restoration as the goal of the project would make the Agency's intent clearer.

Response: We agree. The project objective and purpose and need will be reviewed and edited as needed to make it clearer that ecological restoration is the project objective and resource desired condition driven.

Comment #45-1: The City of Flagstaff is appreciative....regarding inclusion of the Schultz Creek and Ft. Valley areas - both primary contributors to the Rio de Flag Watershed (RFW) into the 4FRI's forest treatment strategy...The RFW is of critical importance to our community.

Response: Thank you for your comment. Approximately 11,171 acres of the Ft. Valley area are not included in this analysis as an environmental analysis (Wing Mountain analysis) decision. However, approximately 4,300 acres of prescribed burning would be part of this analysis. The acres proposed for treatment are located within 1 mile of private property within the Ft. Valley area. Although the Experimental Forest has been excluded from this analysis, approximately 3,200 of treatments are proposed on the Forest's north and eastern boundary. However, to address the City's concerns, we have included treatments in the Dry Lake Hill (2,150 acres) and a portion of Elden (approximately 5,300 acres) to include hand thinning and burning on slopes greater than 40%.

Comment #45-2: The Ft. Valley Area...this area may be outside the specific scope of the 4FRI, but forest treatments in the area nonetheless need to be expanded and/or maintained.

Response: Thank you for your comment. Please see our response to Comment # 45-1.

Comment #45-3: The Schultz Creek was likewise part of a GFFP planning area, completed roughly five years ago. Forest treatments in this area have not been implemented. As with Ft. Valley, the is area may be outside the specific scope of the 4FRI, but forest treatments in the area nonetheless need to be implemented and maintained over time....The GFA-CWPP...clearly identifies the RFW as a priority area for future forest treatments.

Response: Thank you for your comment. Schultz Creek was part of the Jack-Smith Schultz environmental analysis. The decision has been made and the area is ready for implementation. For this reason, it will not be part of this proposed action.

Comment # 44-1: The excessive use of prescribed fire to bring this (restoration of Arizona's forests) presents a real threat to the health of northern Arizona residents and is, in the long run, counterproductive to the long range goals of preserving our air and water quality at as high a level as possible.

Response: Thank you for your comment. It is not clear what constitutes 'excessive prescribed fire'. In regards to air quality, the USFS is required to comply with air quality standards set by the EPA, as enforced by the Arizona Department of Environmental Quality (ADEQ). Fire is a necessary component of healthy ponderosa pine forests and using it to restore the functioning of these ecosystems, including water resources, is necessary. Effects from the lack of fire can take a decade or more to become apparent, and may folks living in the vicinity of the project area (Flagstaff and Williams, Arizona) have become accustomed to seeing dense forests of ponderosa pine, without realizing they're not healthy or sustainable. Ponderosa pine evolved with frequent fire and the only way to restore it effectively is with fire or a combination of fire and mechanical. We realize that smoke is a concern of many people, from the perspectives of health, visibility and/or from the different perspectives of what constitutes 'scenic integrity'. We expect that there would be increases of smoke over current levels, though we will not exceed the levels allowed by the ADEQ.

Smoke from prescribed burning is actually less dangerous and thick than that produced by large, uncontrollable wildfires as because prescribed fires are implemented when atmospheric conditions are stable and fuel moisture is high enough to maintain flame length, combustion, and spread rates within prescription, combusting less than 50% of the available fuel (Weidinmyer and Herteau 2010, p.13, 17). Additionally, the Weidinmyer and Herteau study found that prescribed fire conditions are such that overstory tree mortality rates are low, leaving much of the live-tree carbon pool intact. As a result, the amount of biomass combusted during a prescribed fire is less than what would occur during a wildfire. We continue to plan prescribed burns on days when ventilation can carry the smoke up and over communities. We also work with neighboring forests to coordinate our burns so we can lessen the impact of smoke on communities, as we understand that it can be burdensome on residents and want to keep the air as clean as possible during the burns. However, experience over the last several decades proves that fire (and smoke) exclusion is simply not possible in fire-adapted ecosystems. Given the sole choice of prescribed fire or wildfire, it is clear that prescribed fire has fewer negative consequences than large, high-intensity wildfires.

In regards to water quality, the project is expected to result in increasing water quality, not just preserving the current level. Southwestern soils do not receive nutrients from decomposition as readily as other (wetter) areas of the country do. However, frequent fire returns nitrogen to the soil in the Southwestern region, and healthy soils are a critical component of healthy watersheds and high water quality. Fire contributes to healthy surface vegetation - wild flowers and other plants, promoting wildlife habitat (Bataineh et al 2004; Cram et al 2006; Law and Kolb 2007). Fire also maintains grasses that reduce erosion and maintain watershed health. "In our study, fire was crucial for restoring richness and herbcover of the mixed conifer understory community because it reduced litter depth and coarse woody debris, providing more bare ground which may favor herb germination" (Waymen and North 2006). This is also true for ponderosa pine.

We use prescribed fires to clean and restore the forest to healthier conditions; allowing fuels to build up would result in extremely hot fires that negatively impact the landscape, private property, and communities. The after effects of the Schultz fire – mudslides, flooding, and debris flows, are

an unavoidable consequence when wildfires burn in these unnaturally dense forests. Prescribed burns are conducted in accordance with federal regulations after several levels of review and approval, and must be approved by ADEQ prior to implementation.

Comment #44-2: Arizona has 12 Class 1 areas. A number of these are in the area that will be affected by the smoke from prescribed burns implemented as part of 4 FRI. This will further reduce visibility and therefore visitor enjoyment of the national parks which are one of the major attractions bringing tourists and revenue to northern Arizona. Large-scale prescribed burns in the Four Forests would, in the long run, be counterproductive to this goal (eliminate human-caused visibility impairment in Class 1 areas across the country) as well as detrimental to the health of the forests, the economy of the region, and the well being of northern Arizona residents.

Response: Thank you for your comment. The degree to which prescribed burning treatments would affect air quality, Class 1 airsheds, and recreation/tourism opportunities (potential impacts to local and regional communities) will be addressed in environmental consequences. Eliminating human-caused visibility impairment in Class 1 areas across the country" is not a realistic or beneficial option for managing the ponderosa pine forests which constitute the majority of the public lands included in this project, and is certainly not within the scope of this project. Smoke from prescribed fires is an unavoidable part of the restoration of ponderosa pine forests and living in an ecosystem adapted to frequent fire. Prescribed fires are conducted when weather conditions are such that the majority of smoke lifts up and is dispersed, and the smoke from these prescribed fires is a fraction of that that would come off the same area should it burn in a wildfire. Although we take precautions when burning to minimize smoke impacts, there will be impacts and these impacts will be within those limits set by the AZDEQ.

Comment #44-3: The 4FRi acreages are mostly located on the West, South and Northwest of Snowflake and other communities on the Colorado plateau...Since we are located at a lower elevation than the surrounding forests, our air flow is generally from the west to southwest, and we commonly have northwest breezes during the winter months, much of the smoke from the 4FRI will tend to come down on our communities (particularly at night), worsening our air quality and creating an increased health hazard.

Response: Thank you for your comment. The current proposed treatments are focused on the Coconino and Kaibab NFs, and very little of the smoke produced from implementation of this project is likely to have the potential to impact Snowflake, AZ. However, we will evaluate how prescribed fire treatments (smoke) may impact air quality as well as disclose potential social impacts from the presence of smoke in Snowflake, Arizona area if our projections show that there is potential. The USFS is required to comply with air quality standards set by the EPA, as enforced by the Arizona Department of Environmental Quality (ADEQ).

Effects from the lack of fire can take a decade or more to become apparent, and many folks living in this area (such as Flagstaff and Williams, Arizona) have become accustomed to seeing dense forests of ponderosa pine, without realizing they're not healthy or sustainable. Ponderosa pine evolved with frequent fire, and the only way to restore it effectively is with fire or a combination of fire and mechanical. We realize that smoke is a concern of many people, from the perspectives of health, visibility and/or opinions of what constitute 'scenic integrity'. We expect that there would be increases of smoke over current levels, though we will not exceed the levels allowed by the ADEQ. Smoke from prescribed burning is actually less dangerous and thick than that produced by large, uncontrollable wildfires as because prescribed fires are implemented when

atmospheric conditions are stable and fuel moisture is high enough to maintain flame length, combustion, and spread rates within prescription, combusting less than 50% of the available fuel (Weidinmyer and Herteau 2010, p.13, 17). Additionally, the Weidinmyer and Herteau study found that prescribed fire conditions are such that overstory tree mortality rates are low, leaving much of the live-tree carbon pool intact. As a result, the amount of biomass combusted during a prescribed fire is less than what would occur during a wildfire. We would continue to plan prescribed burns on days when ventilation can carry the smoke up and over communities. We also work with neighboring forests to coordinate our burns so we can lessen the impact of smoke on communities, as we understand that it can be burdensome on residents and want to keep the air as clean as possible during the burns. However, experience over the last several decades proves that fire (and smoke) exclusion is simply not possible in fire-adapted ecosystems. Given the sole choice of prescribed fire or wildfire, it is clear that prescribed fire has fewer negative consequences than large, high-intensity wildfires.

Comment #44-4: We should find some other method than the use of massive prescribed burns to restore the health of Arizona's forests.

Response: Thank you for your comment. The restoration proposal includes mechanical thinning and burning and is not limited to burning only. Also see response #44-1, #44-2, and #44-3.

Comment #43-1: This (purpose and need for action) section was silent about the need for economic partners, e.g., that "appropriately sized industry" and the contract necessary to attract such industry.

Response: Thank you for your comment. We agree. The project objective will be edited to include the need for economic partners and appropriately sized industry.

Comment #43-2: There is no mention of the need for a large-scale, long term contract in order to accomplish the...goal of 4FRI. This contract needs to be for a 20-year time period. Surely this is a need which can be expressed in a Purpose and Need for Action statement without getting into contractual specifics.

Response: Thank you for your comment. While the project objective can be revised to reference the need for economic partners and appropriately sized industry the issuance of a contract (and the terms of the contract) is not a purpose and need in the context of NEPA. The purpose and need identifies the need for change in terms of the need to move towards forest plan desired conditions. The proposed action consists of only those actions that are subject to the requirements of NEPA. However, in addition to adding to the project objective statement, the economic analysis will utilize contracting information (as well as the length of the contract) and assumptions as part of the economic environmental consequences.

This NEPA analysis will assume project implementation occurs for 10 years. This is consistent with the direction in the CFLR Act which uses a 10-year timeframe. It is also consistent with Council on Environmental Quality (CEQ) guidance which states if proposals have not yet been implemented, or if the EIS concerns an ongoing program, EISs that are more than 5 years old should be carefully reexamined to determine if the criteria in 40 CFR Section 1502.9 compel preparation of an EIS supplement. As the document ages, Chapter 18 reviews can be completed to determine whether the decision can continue to be implemented.

Comment #43-3: The only explicit mention of the term thinning is for Gambel oak, aspen and grasslands....You need to be specific about all the types of areas that will require "thinning", not just the minority areas in terms of volume.

Response: The proposed action will be refined and clarify where and in what amount thinning is included.

Comment #43-4: Regarding the maintenance of the forests over time, you only noted the use of fire...there will also be a need for mechanical thinning. Already there is a demonstrated need (and call by some groups) to "re-enter" portions of the landscape that have previously been mechanically thinned. Both fire and mechanical thinning should be available tools to maintain our forests in a healthy condition.

Response: Thank you for your comment. This analysis includes mechanical treatment and prescribed burning within the 10-year planning window. Maintenance burns are needed as it will be challenging to get fire on the ground at an acreage amount that is sufficient to keep up with mechanical treatments and regeneration rates (combined). Post treatment forest development will be simulated and conditions will be disclosed in the EIS. The need for future (beyond the 10-year planning period) mechanical treatments will be addressed in the effects analysis but no additional mechanical entries beyond the initial mechanical entry are proposed in this EIS.

Comment #43-5: The statement is made that the Forest Service intends to conduct restoration activities over approximately a 10-year period. This statement should be changed to a 20 to 30 year period...The 10-year time frame....understates the complexity of the amount of thinning and restoration needed within the project area.....Absolute need for a long-term contract well beyond the "approximately a 10 year period".

Response: Thank you for your comment. See response # 43-4. Whether analysis continues to allow for thinning past 10 years will be evaluated through document review/validation (Chapter 18 review per Forest Service Handbook (FSH) 1909.18).

Comment #43-6: The statement that "trees cut would be mechanically piled, burned, lopped and scattered or removed is indicative of the old model of the Forest Service, whereby contractors were subsidized to pile and burn the results of thinning efforts...If 4FRI....represents a new model whereby forests are thinned and set on a path towards restoration because of the recognized economic value of the woody biomass.....any Proposed Action should be absolutely clear on this point and not hide behind the old tired pile and burn verbiage.

Response: Thank you for your comment. Based on site specific site conditions and the need to meet forest plan requirements for residual snags and coarse woody debris, it is likely that materials could be treated with various methods that include pile and burn or lop and scatter or removal. In order to provide maximum flexibility to the districts in terms of having options that best meet resource conditions, this option will be left in the proposed action and woody biomass (as an expected product) will be added. Ultimately, product value will be determined by the purchaser and the Forest Service would implement the most economically efficient option that moves toward landscape desired conditions.

Comment #43-7: What is meant by "Cut trees using a range of treatment methods including group selection, intermediate and pre-commercial thinning? Pre-commercial thinning implies removing trees of less than merchantable size from a stand so the remaining trees will grow and

increase in value, and therefore profit. Does the Forest Service really want to do pre-commercial thinning in Arizona's ponderosa forests.....Would be contrary to your stated policy to manage for old age (and hence (and hence larger) trees.

Response: Thank you for your comment. Any reference to pre-commercial thinning has been removed. The treatment type that would be used is Stand Improvement (SI). The SI treatment is planned for forested areas that have very few trees in the mid-aged or older VSS classes and would be used to improve growth and vigor. This treatment would begin the conversion to an uneven-aged condition and establish grass/forbs (non-forested) openings between residual tree groups and clumps. Most treatments have been designed to move towards a balance of age classes (uneven structure) and to focus on the retention of old trees which are under-represented across the landscape. Large trees can be promoted by thinning and reducing competition which allows for growth into the larger classes in less time. Regarding

Comment #43-8: There needs to be a clear, unequivocal statement about the extent and amount and types of cutting, a statement that does not hide behind treatments. If there is expected to be commercial thinning and harvesting - read "cutting" - then that needs to be a very real part of the proposed action, especially if the desired restoration work is dependent upon such commercial activity.

Response: Thank you for your comment. The refined proposed action will include more specific information on acres to be treated and types of treatments/harvesting techniques that would be used. Trees would be removed to move toward the desired condition. Value of the removed tree volume would be determined by the purchaser. It is assumed that some of the tree volume removed would have value and some of the volume would be removed by the Forest Service, resulting in a net cost to the government.

Comment #42-1: We are concerned regarding the limited number of treatment types as presented....Hope there will be a variety of treatments that actually could be implemented within any one of the treatment options identified. GFPP looks forward to working...to develop treatment scenarios into more specific treatment options based upon site specific resource considerations.....Ensure that the PA results in a diversity of thinning and fire treatments that provide the full natural range of variability of forest structure, composition and function necessary to meet all resource objectives and that will support natural fire regimes across the landscape.

Response: Thank you for your comment. In some cases, redistributing mechanical treatments for the express purpose of creating heterogeneity would not comply with the forest plan (Mexican spotted owl protected habitat). However, the refined proposed action is designed to move towards heterogeneity - expressed in the analysis as moving towards/creating an uneven-aged forest structure with all age classes represented and by moving towards restoring grasslands (including encroached meadows). The refined proposed action includes a range of treatment options within each treatment type that are designed to build in heterogeneity by allowing site specific forest conditions (site class, quality) to determine the percent opening that is appropriate. For example, the percent of openings would range 10% to 25%, 25% to 40% and 40% to 55% with adjustments made for wildlife corridors and soil characteristics. Heterogeneity would also be accomplished by the pattern and size of groups and gaps, the structure (VSS) of tree groups and the density of each tree group. There are currently five treatment types in northern goshawk foraging areas that include un-even aged (UEA), intermediate thinning (IT), stand improvement (SI), savanna, and

grassland (GL) restoration. There are three treatment types in goshawk PFAs including UEA, IT, SI and 1 treatment type (pine/sage) that is specific to Tusayan. There are two small scale treatment types for aspen, seeps and springs. There are four Mexican spotted owl (MSO) treatment types specific to PACs, threshold, target and restricted habitat. There are no treatment areas within MSO PACs and general no treatment areas. Fire treatments would add additional heterogeneity to the landscape.

Comment #42-2: GFFP believes that the Lake Mary Watershed (LMW) is a priority treatment area (municipal water supply course prioritized in the local CWPP). In utilizing a strategic placement of treatments approach, we recommend the LMW is prioritized as one of the first treatment implementation areas. GFFP would like to work with the FS, City of Flagstaff and other stakeholders to designate the LMW as a priority area and assist in designing a treatment approach and an aggressive timeline that reduces the potential negative effects of a severe fire on this critical watershed that so many citizens cherish and rely on.

Response: Thank you for your comment. A prioritization/resource value and risk matrix was part of the process used to refine the proposed action. The Lake Mary Watershed has been included in the proposed action and identified as a priority area. This analysis will display priority areas; however, treatment sequencing will be up to the individual districts.

Comment #42-3: The GFFP is concerned about the lack of specificity in the PA...about where, when and what type of treatment action will take place. Related issues are: determining where treatments, especially silvicultural and fire-based, fit into a trajectory of achieving restoration objectives outlined in the Desired Future Conditions (DFCs); how stakeholder filters (such as the Candidate Areas or the Old Growth Protection and Large Tree Retention Strategy) may affect treatment placement and intensity; and how various other filters are applied and prioritized to potentially modify and refine proposed treatments at the project level. ...GFFP commits to working...to develop a landscape restoration matrix that can be incorporated into the final PA; one that could be used at the Treatment Area, Firescape or full Analysis Area level.

Response: Thank you for your comment. The refined proposed action includes the specificity mentioned (what/where/how, etc.). Treatments have been designed to reflect existing vegetation conditions, and to meet desired resource objectives. In terms of being in alignment with the landscape strategy desired conditions, the IDT thoroughly reviewed the desired conditions. In some cases, we found the purpose and need and proposed action to be in total alignment with the strategy's desired conditions. In other cases, we found that items described as desired conditions were, in some cases, implementation recommendations or already decided by law, regulation, policy, and/or forest plan. In terms of prioritizing needs for treatment and fire, the filtering strategy and prioritization process used by the IDT is to very similar to the prioritization process used in the stakeholder-provided Landscape Strategy.

Comment #42-4: We are surprised the CFLRP was not mentioned in the PA, as well as how the two projects work together.

Response: Thank you for your comment. The scoping letter was designed to be extremely concise with limited background information. The DEIS will have a more complete history of 4FRI which includes the CFLR Act of 2009, the funding submittal developed by the Forest Service and 4FRI stakeholders and the CFLR funding received to support the restoration effort.

Comment #42-5: We look forward to implementing an effective adaptive management program...essential component is an efficient, cost effective monitoring program that will directly inform management decisions. Without adaptive management in the forefront, the potential success of the 4FRI project will be compromised.

Response: Thank you for your comment, we agree.

Comment #41-1: The Department would like to work collaboratively on a comprehensive restoration assessment.....could identify possible management actions that focus on a wider range of forest resources than just timber and fire....We would like to begin working with you on this assessment as soon as possible.

Response: Thank you for your interest in continuing to work on comprehensive restoration. As a cooperating agency we look forward to working with you on this.

Comment #41-2: We would like the Forests to elaborate on how conventional silvicultural treatments described in the PA will be applied/and or adapted to achieve ecologically-based restoration objectives.

Response: Thank you for your comment. The refined proposed action includes seven different vegetation treatment types. Flexibility has been built into each treatment to account for site conditions and to allow the districts/forests to apply ecologically-based treatments (read the land approach).Departure from desired conditions would inform where treatment is needed and also inform what type of treatment is needed. Site potential is key component to treatment design. For example, the desired amount of non-forested (grass/forbs) openings between tree groups is dependent on site potential. Non-forested openings would range from 10-25 percent in areas with high site potential and 55-70 percent in areas with low site potential. See response 42-1 for further discussion on treatment types.

Comment #41-3: The Department agrees with all of the desired conditions stated in the PA, and we also recommend consideration of the desired conditions from the Landscape Restoration Strategy for the First Analysis Area...(October 2010)...We also encourage the Forest to consider the desired conditions as described in the Draft Desired Ponderosa Pine Forest Conditions for Wildlife in Arizona.

Response: Thank you for your comment. We reviewed the landscape strategy desired conditions and applied or compared the desired conditions to the purpose and need where appropriate. In some cases, we found that some desired conditions in the strategy were actually implementation recommendations or already decided by law, regulation, policy or the forest plan. Please see the Scoping Report for the review and comparison of the strategy desired conditions to the project's purpose and need. Desired condition statements in the draft Desired Ponderosa Pine Forest Conditions for Wildlife in the Southwest are largely in alignment with the goals in proposed action, including statements like: create a heterogeneous, multi-aged, clumpy/groupy forest structure; create groups and clumps with interlocking crowns separated by inter-spaces and openings; create a mosaic of groups; retain understory species; etc. However, there will also be differences, e.g., sizes of groups and openings may vary wider than the specific recommendations, multi-aged forest structure will be achieved more so from the interspersion of age-classes and less from uneven-aged groups (although uneven-aged groups will occur), and planning will not likely be as detailed as the recommendations in the draft Desired Conditions (i.e., we will not be conducting landscape planning at the scale of 100ths of acres). This is in

alignment with current treatment designed for the proposed action. Another document on aspen forwarded by the Department was reviewed. We found it to be most applicable to large, continuous stands which are found in the San Francisco Peaks area - which is not part of this analysis. However, the refined proposed action is in alignment with the study's recommendations in terms of planning and designing aspen restoration (decision tree questions) and using local experience and knowledge to design treatments.

Comment #41-4: We would like a better understanding of targeted ranges for tree group size, basal area, trees per acre, and stand density index. The proposed action would also benefit from an expanded discussion on how to achieve vertical and horizontal heterogeneity in forest structure; an important component of wildlife habitat as well as an important characteristic of developing old growth.

Response: Thank you for your comment. The size of tree groups (which would range from 0.1 to 2 acres in size), openings, the distribution of tree size classes within groups, stands and treatments areas (pre and post treatment), the range of basal areas and tree densities will be displayed as treatments have to be designed to be in compliance with the forest plan. Percent canopy cover in goshawk foraging habitat will be evaluated at the group level for VSS 4, 5 and 6 groups and would be 40%+ in foraging areas and 50%+ in goshawk PFAs. A project area wide canopy cover assessment will be used to disclose the existing condition at the stand (stand sizes range from approximately 5 acres to 300 acres) and treatment area (treatment areas range from 5,000 to 20,000 acres) level.

Comment #41-5: Department support the inclusion of riparian and ephemeral channel restoration into the PA. However, the current PA currently lacks specificity on where and how this will be achieved.

Response: The refined proposed action includes the specificity needed to address the what/where/how of channel restoration.

Comment #41-6: It is our understanding that the maps displaying proposed ...treatment approaches have yet to be filtered for wildlife factors....we are hoping to have the opportunity to review these maps in the refined PA.

Response: Every opportunity will be provided for reviewing the refined proposed action and the supporting documentation. As a cooperating agency we expect your participation and input during this process.

Comment #41-7: We fully support uneven-aged treatments but would recommend the Forests consider additional heterogeneity in the percent open condition. Greater spatial variability in forest density will provide a broader range of habitat conditions for the diverse wildlife species that occur across the two forests. For treatments that occur on mollic integrade soils, consider using topography and aspect to determine heterogeneity, allowing for more treatments in the 10-25% and 25-40% open category. Inter-mingling these different treatment intensities across the landscape will better help to provide habitat heterogeneity for wildlife at the landscape scale.

Response: Thank you for your comment. Your recommendations are reflected in the refined PA which was developed in concert with the department as a cooperating agency. Topography is a component of SDI, and was used to develop the proposed treatments. In terms of designing treatments that would result in heterogeneous habitat, flexibility has been built into each

treatment to account for site conditions and to allow the districts/forests to apply ecologically-based treatments (read the land approach). The refined proposed action includes a range of treatment options within each treatment type that are designed to build in heterogeneity by allowing site specific forest conditions (site class, quality) to determine the percent opening that is appropriate. For example, the percent of openings would range 10% to 25%, 25% to 40% and 40% to 55% with adjustments made for wildlife corridors and soil characteristics.

Comment #41-8: The Department recommends further exploration of how the shift from measuring forest canopy cover at the group level versus the stand level will impact wildlife...More important than any percent canopy cover measurement is a clear description for how canopy cover interconnectedness, vertical heterogeneity and group size variability will be achieved at various scales....continue to work with the Forests and stakeholders on this issue.

Response: Percent canopy cover in goshawk foraging habitat will be evaluated at the group level for VSS 4, 5 and 6 groups and would be 40%+ in foraging areas and 50%+ in goshawk PFAs. A project area wide canopy cover assessment will be used to disclose the existing condition at the stand (stand sizes range from approximately 5 acres to 300 acres) and treatment area (treatment areas range from 5,000 to 20,000 acres) level. We would maintain/meet canopy cover requirements where it exists and the treatments have been designed to move towards meeting the guidance where it currently does not meet forest guidelines.

Comment #41-9: Develop a robust, science-based, realistic, monitoring plan with clear thresholds that trigger changes in management. Scaling up our restoration effort means scaling up our impact on wildlife and other resources; as such, we need a complementary scaling up of our monitoring efforts.

Response: We agree with the need for a strong Adaptive Management plan. As a cooperating agency, we look forward to working with you on the adaptive management and monitoring plan.

Comment #41-10: We would like to begin working...with 4FRI and...stakeholders to capitalize on wildlife-based research opportunities.

Response: We agree. The purpose and need and proposed action include additional detail needed to support both the use of adaptive management and monitoring. A robust monitoring plan is a high (and immediate) priority. We look forward to working with you on this task. As we develop the monitoring plan, opportunities for research can be discussed. However, we will not require research as a monitoring activity. Required monitoring within the EIS will be tied to forest plan monitoring needs. In addition, we are looking towards a multi-party monitoring approach, of which we would hope that the Stakeholder group would be an active participant.

Comment #40: I strongly support this proposed 4FRI. This proposal is comprehensive, well-balanced and urgently needed...thrilled that many diverse interests and stakeholders were able to negotiate in good faith and reach such a broad and positive proposal..If successfully implemented, I believe this proposal will result in significant environmental, economic, social and recreational benefits, and perhaps serve as a precedent for reaching consensus elsewhere on how to resolve complex and potentially contentious resource management challenges.

Response: Thank you for your comment and support.

Comment #39-1: We support the Forest Service's stated goal of focusing management of Mogollon Plateau ponderosa pine forests on ecological restoration.

Response: General comment – no response needed.

Comment #39-2: ...This lack of specificity in the Proposed Action undermines the entire NEPA process...encourage the Forest Service to take...additional scoping steps as necessary to develop a proposed action that is sufficiently specific to facilitate meaningful public comment, issue identification and alternative development.

Response: Thank you for your comment. Since January 20, 2011, interested parties have been informed that a refined proposed action would be made available for public comment. The refined proposed action will be made available for public comment.

Comment #39-3: We remain concerned that a programmatic EIS followed by a tiered site specific actions would best serve the 4 FRI project and that the scale of the Proposed Action may preclude satisfying NEPA's site-specific requirement.

Response: Thank you for your concern over the need for a programmatic EIS. Forest databases, which include data from monitoring and inventories of forest resources were used to answer who/what/when/where/ and how much - these are the key elements needed for environmental analysis. Given the period of time this analysis is expected to be in effect the analysis will explicitly include the need to conduct environmental reviews prior to implementation. The purpose of the environmental reviews is to document compliance with the NEPA decision. Should a review indicate the planned action is not within the scope of the environmental consequences analyzed and decision made, additional analysis would be required.

Comment #39-4: The entire 4FRI effort spanning 2.4 million acre focal area could be legitimately construed as a single proposed action warranting analysis in one singular programmatic EIS and that a programmatic EIS, under the letter of the law, is in fact the proper NEPA vehicle for this effort....In the case of the "Four-Forest Restoration Initiative", including only one phase involving only two of those four forests in a single EIS could be reasonably construed as "irrational", at least when viewed through the lens of the law. Again, we maintain that a Programmatic Environmental Impact Statement would remedy this potential problem.

Response: In terms of a programmatic analysis, the forest plans serve that need. Desired conditions have been developed from the current forest plans as well as the draft working plans. Forest inventories and assessments have been used to inform management actions included in this analysis. It is unclear what additional benefit a PEIS would achieve and how the need to have multiple and additional environmental assessments would achieve the landscape restoration goal in as efficient and effective manner as the planned EIS. Possible management actions have been provided by the forest plans, provided by the stakeholder Landscape Strategy and from input from district and forest resource specialists. Other agency experts from Arizona Department of Game and Fish and USFWS have provided information from their inventories and professional knowledge to inform the existing and desired conditions analysis and possible management actions. Extensive stand exams have provided existing condition information to inform the vegetation analysis. In cases where uncertainty existed in terms of the existing condition on the ground, 4FRI specialists conducted field trips to validate current conditions (see wildlife, fire, vegetation reports). With regards to a single proposed action across 4 forests, we disagree. The ponderosa pine continuous vegetation condition that applies to the Coconino and Kaibab, will not

apply to the ASNFs and Tonto. Mixed conifer is likely to part of the analysis area. By the time the need for change assessment is made for the Tonto NF, most treatments may have already occurred, negating the need for analysis.

Comment #39-5: The proposed action should describe the project in the context of Federal Wildland Fire Policy and its goals of facilitating public and firefighter safety and maximizing fire's natural role in wildland ecosystem.

Response: The purpose and need component of the proposed action addresses both public safety and the desired condition of returning fire into the ecosystem. The goal of this project is restoration and is not confined to fire. The desired condition is to move towards returning fire to the environment as a component of restoration. The fire analysis will include a discussion of restoration of natural fire regime/s in the project area. Thus far, it has not been discussed at length as it is in the effects (environmental consequences) analysis where this information is best displayed. In areas where there are currently no need for change (no projected negative effects from the potential effects of wildfire), the proposed action includes burning only treatments to reflect that little needs to be done other than burning. Focusing on areas where there is currently potential for undesirable effects would allow greater flexibility in the use of prescribed fire and in for managing natural fires when they occur. "Reducing the risk of high-intensity fire, including crown fire, should be the treatment priority when restoring forests that historically burned frequently" (Hood 2010). In addition, the analysis will document how the alternatives are consistent with applicable law, regulation, and policy.

Comment #39-6: The proposed action should describe Firescapes as a geographic context within which to plan and deploy strategically placed treatments that can facilitate safely managing planned and unplanned ignitions...use the definition and description to provide additional clarity and specificity to the purpose of firescapes as an geographic context for planning and deploying strategically placed treatments in a way that serves fire management goals.

Response: Using the landscape strategy definition of firescape implies 4FRI is a fire-centric project and it diminishes the objective that is aimed at landscape restoration. Forest health, forest structure, forest composition, moving towards watershed improvement is as important as is the need to move towards fire management goals. The FS definition of firescape will be defined in a glossary. Firescapes will be changed to "Restoration Unit" based on transportation routes and 5th code watersheds. Treatment Units (which are based on an aggregation of 6th code watersheds) have been changed to RU1-Subunit X. RU 1-Subunit X, RU 1-Subunit X. The proposal to change the terms from firescape to restoration unit was discussed with the stakeholders on April 27, 2011 (public meeting held at the Mormon Lake Ranger District).

Comment #39-7: The proposed action should describe how restoration treatments can be strategically designed, located and sequenced to efficiently and safely facilitate operational fire management, community protection, and landscape-scale restoration of ecologically beneficial fire regimes at landscape scales. Toward that end, some key questions that the Forest Service should be seeking to answer in the proposed action and subsequent analysis are: (1) Where and under what conditions can natural ignitions be managed for resource benefit under current...plans?, (2) Where can treatments be located to facilitate containment and management of planned or unplanned ignitions within firescapes or subsets thereof, (3) How can treatments be positioned and sequenced to most efficiently reduce the potential for landscape-scale crown

fire..... Treatments should be distributed in the project area with spatial patterns of crown fire spread in mind.

Response: The revised proposed action has been designed to meet several objectives in addition to fire. The effects analysis will display how the proposed action moves towards desired condition of reduced crown fire and high intensity surface fire potential - two objectives in this restoration analysis. How the proposed action provides for fire fighter safety and response, community protection and moving towards FRCC 1 will also be displayed. How the treatments facilitate management of unplanned ignitions/provide opportunities for forests to make decisions on how unplanned ignitions are to be managed will be displayed in the effects analysis. The proposed action is not being designed solely to facilitate the management of unplanned ignitions.

Crown fire is, a major concern in terms of fire effects, but high intensity surface fire is also lethal to ponderosa pine, and damaging to other resources, such as soil and surface vegetation. It is not unusual for areas that burned with passive or even active crown fire, to show only minimal effects on soil. We are using both in our process.

Comment # 39-8: Consider targeting treatments in fire suppressed VSS 3 stands that are (1) within 1/4 mile of roads, (2) that exhibit active or passive crown fire under 95th percentile conditions, and that (3) occur in patches of 50 acres or larger....Acres precluded from mechanical treatment should not automatically be excluded from fire use...Identify landscape features that are currently resilient to fire disturbance and use those sites as anchor points..for long term fire management oriented to use of planned ignitions for resource benefits...Sites may include natural openings, meadows, relatively open ridges, riparian areas, patches of mature forest with relatively shaded and cool microclimates and sites where fuel reduction work has already been completed.

Response: Overall, we feel the refined proposed action addresses your suggestion with some exceptions. The IDT reviewed the suggestion which includes thinning and burning along "buffered roads". Using roads as a guide would not meet the broader ecological restoration perspective, though they have been used to identify access and operational needs. Our fire ecologist collaborated with fire experts from our region, the Southwestern Regional Office, the Pacific Northwest USFS Regional Office and Rocky Mountain Research Station to determine the weather parameters for fire modeling. This analysis uses the conditions under which the Schultz Fire burned, rather than using weather percentages. Both are valid analysis, but the 'real' fire conditions represent actual conditions, while percentile conditions are highly unlikely to occur. Schultz conditions occur every year and, because they are not as unique, show the areas of greatest concern for fire effects and behavior - areas that could burn with active crown fire or very high surface intensity under conditions that occur on multiple days every year, rather than just exceptional days. (3) We are using 50 acres in order to be consistent with earlier modeling efforts (Forest ERA), but there was no explanation given in those efforts as to why 50 acres was an acceptable number for crown fire. Acres precluded from mechanical treatment are NOT automatically excluded from fire use. On both the COF and KNF, 'fire use' is already allowed across the forests when conditions (fire weather, fuels, and emissions) are such that fires can be allowed to burn.

Comment #39-9: Prioritize active fuel management in areas where relatively little resource investment may create relatively fire resilient stand conditions....May include low productivity sites with little encroachment of small trees and relatively open stands that are currently dominated by large conifers....Targeting work in these areas will maximize the area treated and

effectiveness of treatment with available funds and personnel.....greatest opportunity to quickly reduce fuels and restore ecosystem function at larger spatial scales.

Response: The proposed action represents using a strategy that would quickly (relatively) reduce fuels and restore ecosystem function. 1) All savanna and grassland restoration areas that have a lower (fire) priority based on existing conditions were added to primary category due to the ability to restore these areas to within HRV with one treatment, and, 2) Relatively open stands that have structural characteristics where no mechanical treat is warranted to move towards desired conditions are fire only treatment (over 200,000 acres) under the proposed action. Once treatments occur in these situations, the areas can serve as operational anchor points for prescribed fire:

Comment #39-10: The EIS must describe tree mortality and other structural changes resulting from restoration treatments and from fire management following treatments on an ongoing basis....Losses of canopy, large trees, small trees and resulting recruitment of logs and snags will affect long-term forest dynamics, stand development and wildlife habitat suitability. We urge the Forest Service to exhibit caution in so doing: Post treatment large tree mortality have exceeded planning targets at several restoration sites in Northern Arizona.

Response: We have quantified coarse woody debris (CWD) and snags for the existing condition based on Forest Vegetation Simulation (FVS) modeling. These will be tracked through the mechanical/fire treatment simulations into the future. FVS models both competition mortality and fire effects (mortality). A design feature for areas deficit in CWD would be to leave tree/log 12" + on site to move towards desired conditions. Large, dead material on the ground in areas with thick layers of litter and duff may decrease before it increases, particularly in areas proposed as 'fire only' where such materials must be recruited from existing trees and snags.

Prescribed fire prescriptions that are hot enough to kill small trees would also consume much of the surface fuels. Where there are thick layers of litter and/or duff under or adjacent to large down logs or smaller CWD, fires have longer residence time and will produce more heat resulting in greater consumption of dead/down woody material of all sizes. Once most of the litter/duff has been consumed (usually in the first or second entry with fire), there will be minimal litter/duff build up in most areas, greatly reducing the consumption of dead/down wood and snags by fire. Prescribed fire methods would be used to target the preferred objectives on a given fire, such as burning when duff/litter and the interior of large woody materials are at a moisture level expected to consume X% of fuels of a given size. Mortality of large and old trees would be minimized as much as possible.

On a project of this size, it would not be possible to treat every single snag and large tree, and it is likely that some will be lost. Practically speaking, prescribed burns would be larger and/or more frequent, so individually treating every large and/or old tree in burn units encompassing thousands of acres is not possible. The time and money required to do that would be prohibitive and would result in less fire across the landscape. Burn plans/burn prescriptions would be written with the objective of moving burn units towards the desired conditions as defined in the NEPA document, and would include limiting mortality in old/large trees as much as possible...that means the implementers would do their best to prevent any mortality in old/large trees while meeting all the burn objectives. A recent study in Forest Science (Fowler et al., 2010) showed no difference in mortality resulting from prescribed burning between no treatment and three different treatments including raking and blowing litter and duff from the base of large, old trees. Multiple

studies have shown that removing litter and/or duff had little effect on mortality (Hood 2010; Fowler et al., 2010).

Once treatments occur in the following situations, the areas can serve as operational anchor points for prescribed fire: 1) All savanna and grassland restoration areas that have a lower priority based on existing conditions were added to primary status (priority rating) due to the ability to restore these areas to within HRV with one treatment, and, 2) Relatively open stands that have structural characteristics where no mechanical treatment is warranted to move towards desired conditions are fire only treatment under the proposed action.

Comment#39-11: The Forest Service must demonstrate that the project will comply with the mandatory standards and guidelines for the northern goshawk.

Response: The project will demonstrate how the proposed action is consistent with forest plan requirements.

Comment #39-12: ...Forest Service personnel have stated that they plan to apply canopy requirements of the standards and guidelines relating to VSS 4, 5 and 6 only at the tree group level. The Forest Service cannot arbitrarily relegate standards and guidelines to tree groups because the standards and guidelines apply to all forested lands outside protected areas for the Mexican spotted owl...CNF Plan at 65-7.

Response: Forest plan canopy cover guidelines only apply to VSS 4-6. For this analysis, canopy cover, measured at the group level, will be measured terms of trees per acre and Basal Area. This would provide for heterogeneity across the landscape while meeting forest plan requirements. If basal area and trees/acre were designed to be the same regardless of site condition/class, the result would be a homogeneous, even aged structure maintained through thin from below type of treatment.

Comment #39-13: The Arizona Game and Fish Department has stated that application of canopy cover guidelines as at small tree group scales instead of at larger forest stand scales in mature and old growth ponderosa forest has the potential to significantly reduce the amount of forest cover within treated areas, with detrimental consequences to goshawk and its prey.....Assuming a residual canopy cover within groups of 50 percent, and if groups occupy 50 percent of the stand, canopy cover at the stand scale will be 25 percent, far below required minimums.

Response: We have reviewed the comments submitted by AZG&F that are specific to this project (in 2011) and do not find this conclusion. The analysis for this project will clearly describe how canopy cover will be measured. We will continue to work with the forests and stakeholders on this issue.

Comment #39-14: Restricting minimum canopy cover requirements to groups and excluding inter-space from canopy tallies within VSS 4-6 also conflicts with the plain language of the Management Recommendations for the Northern Goshawk in the Southwestern United States...which the existing amended forest plans...incorporate...The document states, "Vegetation Structural Stage (VSS) is a method of describing the growth stages of living trees. It is based on tree size (dbh) and total canopy cover (Appendix 5, MRNG), whereas VSS is "A generalized description of forest growth and aging based on the majority of the trees in the specific diameter distribution of the stand" (Glossary of Terms, MRNG)..... Forest Service needs to explain how using a silvicultural tool designed for the stand level can accurately be used to

create groups and canopy restricted to the group scale. Achieving structural stages at only the group level could allow a significantly higher number of canopy openings with smaller number of trees between those openings....Canopy cover at the group level could present a false picture of stand conditions and associated canopy...Measuring structural stages and associated canopy densities at the group level only is inconsistent with the science underpinning the MRNG's, the 1996 ROD, and will likely have deleterious effects on northern goshawk and its prey species by failing to provide adequate canopy cover in VSs 4, 5, and 6 at multiple scales.

Response: The MRNG represents a ground shift in approaching forest management in the Southwest. The switch to uneven-age management moved treatment objectives from timber production to creating sustainable forests and associated wildlife habitats. The MRNG states “These recommendations were specifically designed to provide breeding season habitat for the goshawk and its prey” (p.6). They go on to say that a synthesis of the ecological needs for the 14 key goshawk prey species in the Southwest “provided a set of desired conditions that would result in sustainable populations of each prey” (p.4).

Habitat for prey populations is described as forest openings of 1/3 to 4 acres in size and forest patches mid-aged, mature, and old structural stages (p.5). The heart of the MRNG from the management perspective is the development and maintenance of 6 Vegetation Structure Stages. With this foundational shift in thinking came a change in how groups of trees were viewed. Current management planning is still based on the traditional forest “stand” because of the status of the forest, forest databases, and forest tracking mechanisms, i.e., planning is based on the standard definition of “stand” (“a contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit” Society of American Foresters web site http://dictionaryofforestry.org/dict/term/uneven-aged_stand accessed May 5, 2011). Existing stands within the 4FRI analysis area range from <1 ac to >1,200 ac with the average stand size in the range of 40 to 65 acres. The 1st bullet under “key concepts fundamental to the Goshawk Scientific Committee” states forests within goshawk home ranges “should be an interspersed mosaic of structural stages” and “[s]ix vegetation structure stages (VSS) were used to describe regeneration, growth, and development of forests in the Southwest.” Tree harvest required for developing this mosaic of VSS is based on regenerating cuts of <1 ac up to 4 ac in size (see MRNG pp 6&7). These VSSs are commonly described as “groups and clumps of trees.” When a stated concern says using VSS data to describe canopy or forest structure at the group level could present a false description of stand conditions it misses the goals of the MRNG and confuses the concepts of stand and VSS.

In describing stand structure for both Post-fledging Family Areas and Foraging Areas, the MRNG state “A mosaic of vegetation structural stages (VSSs) interspersed throughout the PFA [and FA] in small patches” (pages 23 and 27). That statement is followed by a description of percentages of the PFA and FA that should occur within each VSS (e.g., 60% of the PFA should be in VSSs 4, 5, and 6). It is these broad percentage classes that are to make up the mosaic of VSSs interspersed in small patches. Canopy cover for each goshawk habitat classification (i.e., nest area, PFA, and FA) are displayed in Table 1 of the MRNG (p.7) and specifically define canopy cover values by VSS. Canopy cover is defined on p 87 as “The percentage of a fixed area covered by the crowns of plants delimited by a vertical projection of the outermost perimeter of the spread of the foliage.” By definition, this excludes breaks in the forest canopy that represent interspaces between groups of VSSs, i.e., interspaces lie beyond the “outermost perimeter of the spread of the foliage.”

Clearly, measuring forest metrics within VSS 4, 5, and 6 is both explicit and implicit in the MRNG.

Nowhere in the MRNG do the authors specify how canopy cover is to be measured. Canopy cover is easily understandable and makes intuitive sense as a metric, yet it is very difficult to measure on the ground. Biases exist both between and among techniques so that the same surveyor can get very different results using different methods and even different results repeating the same method. However, forest structure metrics are typically highly correlated and using combinations of some variables can provide reliable estimates of other variables. The end result provides measures of canopy cover that will be used to implement direction in the Forest Plans and follows the guidelines described in the MRNG.

Comment #39-15: Forest Service personnel have also stated that the MRNG did not specify the levels of analysis to take place regarding impacts to canopy....June 1996 Regional forest plan amendment, states... "Distribution of habitat structure (tree size and age classes, tree groups of different densities, snags, dead and down woody material, etc.) should be evaluated at the ecosystem management level, at the mid-scale such as drainage, and at the small scale of site" (Record of Decision for amendment of forest plans, p. 92).

Response: The MRNG do not specify the levels of analysis to take place regarding impacts to canopy. The 1996 amendment to the forest plans interpreted the MRNG and includes the scale analysis referenced above. Both the Coconino and Kaibab forest plans incorporated this direction and provided additional detail. "Ecosystem management area" is defined as a contiguous portion of a Geographic Area generally measured in the thousands to hundreds of acres. The plans go on to say project analyses should be evaluated at the ecosystem management area level, at the mid-scale such as drainage, and at the small scale of site. The fact that this is a recommendation, i.e. a guideline, not a standard, and includes the word "should" indicates the intent was to provide discretion to managers to best address the wide range of individual projects that are planned across National Forest lands (Bruce Higgins, Kaibab Forest Planner, personal communication 2008). If this recommendation is not to be met, it is incumbent on the planning team to describe why and what will be done to meet the intent of the forest plan.

The 4FRI team will conduct analyses at multiple scales as recommended by the Coconino and Kaibab forest plans. However, it was decided that, due to the scale of the 4FRI effort, 4 scales of analysis would be conducted rather than 3. The scales identified include the analysis area (greater than a typical Geographic Area), restoration unit (approximately equivalent to a large EMA), restoration subunit (a smaller EMA), and local sites. Using restoration units and subunits is in response to input received from the 4FRI stakeholder group. We feel using 4 levels of analysis meets the intent of the forest plans and provides more meaningful analysis than using the 3 levels recommended in the forest plans.

Comment #39-16: ...Must allocate no less than 20 percent of each forested "ecosystem management area" to old growth habitat. CNF Plan at 70-1....The revised proposed action should clearly state that no old growth trees will be cut and should designate old growth to its maximal possible extent across the landscape.

Response: The project would manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape and would meet forest plan(s) requirements. Sources of old growth include: 1) MSO "Protected" habitat, 2) MSO "Restricted

Target/Threshold” habitat, 3) MSO “Restricted Other” including: a) Uneven-aged acres with low disease/damage and, b) Even-aged VSS 4-6 with low disease/damage, 4) goshawk nest stands, 5) goshawk PFAs including: a) Uneven-aged acres with low disease/damage b) Even-aged VSS 4-6 with low disease/damage; and, 6) Area outside goshawk PFA including: a) Uneven-aged acres with low disease/damage; and, b) Even-aged VSS 4-6 with low disease/damage. See response # 39-9 for information on how the potential for old tree mortality would be mitigated and evaluated.

In terms of allocating old growth, the Coconino forest plan standard states, “Until the forest plan is revised, allocate no less than 20 percent of each forested ecosystem management area to old-growth as depicted in the table below”. The guideline states, “All analyses should be at multiple scales - one scale above and one scale below the ecosystem management areas. The amount of old-growth can be provided and maintained will be evaluated at the ecosystem management area level and be based on forest type, site capability, and disturbance regimes (forest plan, 70-1). A Coconino forest plan amendment would be part of the proposed action alternative to address the EMA scale. On the Coconino, the restoration sub-unit (units based on 5th code watersheds that range from 5,000 to 20,000 acres) equates to the EMA. An EMA on the Kaibab is considered the vegetation type or the ponderosa pine type for this analysis. No forest plan amendment would be needed.

Comment #39-17: ...Proposed Action does not adequately define within stand openings, interspaces and regeneration openings. All of these terms refer to conditions that describe openings in the canopy, but have very different management goals. We support the restoration of a more natural forest structure that includes fine-scale openings (generally 0.05 to 1.0 acres) interspersing groups of trees.

Response: Thank you for your comment. The definitions of stand openings, interspaces and regeneration openings will be refined in the desired condition and discussion provided. Interspaces between groups would include (but not be limited to) your recommendations.

Comment #39-18: The potential for significant cumulative impacts of noxious weed spread in the project area is high because McGlone and others (2009) showed that cheatgrass abundance and distribution increased 90-fold above a pre-treatment baseline as a result of forest treatments similar to the proposed action.

Response: Occurrences of cheatgrass within the 4 FRI project areas are not well documented. Areas likely to contain cheatgrass infestations include severely disturbed areas such as recent wildfires. The proposed action would restore the structure and processes of the ponderosa pine forests. By doing this, it would reduce the risk of uncharacteristic wildfires such as the recent Schultz Fire (2010).

The Forest Service recognizes the significance of cheatgrass invasions and their effects to ecosystem functions and processes, especially the effects on fire frequency and areal extent. The forests completed the Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds (FEIS) in 2005, which provides the guidance for treatment noxious or invasive weeds on the Coconino, Kaibab and Prescott National Forests. At the time of completion, the extent of cheatgrass infestations and their distributions on the forests was unknown. The FEIS provided for treatment of cheatgrass in certain areas, focusing mainly on some severe infestations on the North Kaibab Ranger District, Kaibab National Forest which were in the habitat of a rare plant of concern on the forest. Since then, the Forests have recognized the severity of cheatgrass.

At the time of the preparation of the FEIS, most scientific studies on cheatgrass focused on grassland and shrub land habitats. Recent studies such as those by McGlone and his co-authors will provide valuable insight into the effects of cheatgrass in forested ecosystems.

McGlone and others (2009) prepared two articles on cheatgrass invasion after restoration treatments at Mount Trumbull, AZ. In one article, published in *Ecological Restoration* titled *Cheatgrass Encroachment on a Ponderosa Pine Forest Ecological Restoration Project in Northern Arizona*, the cheatgrass invasion was documented in 2003, several years after the initial treatment in some units of the study. McGlone and his co-authors cite weather as a contributing factor to cheatgrass invasion. The areas he cited in his study experienced a severe drought in 2002, displacing most plants including cheatgrass. Then the area received above average precipitation in September 2002. Since cheatgrass is a winter annual, the cycle was conducive to cheatgrass germination. During that time, significant increases were seen in cheatgrass cover in all treatments including the control (no treatment area). A similar weather cycle was observed in many parts of the western US during that time, including the Flagstaff area. We believe this is the article you are referring to.

In the other publication by McGlone and others published in *Forest Ecology and Management*, titled *Can pine forest restoration promote a diverse and abundant understory and simultaneously resist nonnative invasion?*, he discusses the issue of cheatgrass invasion on the same study area. In that publication, he mentions that native plant richness and cover increased after treatments but the cover was not sufficient enough to exclude the cheatgrass invasion and again cites drought as a contributing factor. While we cannot control the weather and other environmental conditions, we will incorporate mitigation measures such as not burning during severely dry periods which is one of McGlone's recommendations.

In a review article by McGlone and Egan (2009), titled *Role of Fire in the Establishment and Spread of Nonnative Plants*, the authors review wildfires and prescribed fire in ponderosa pine forests in northern Arizona. In this review they discuss the same restoration treatment area as in the articles above. They mention the cheatgrass invasion but go on to state "Fuel loads at the time of burn were heavy, often resulting in high-severity fires. While many factors were involved in the spread of cheatgrass across the landscape, nonnative invasion on this site was higher than others of similar design". Therefore, while the commenter's point on cheat grass is duly noted, the basis of the comparison may be overstated. One of the objectives of the 4 FRI restoration effort is to promote industry to promote utilization of biomass from the treated areas. This would likely reduce the fuel loading in the treated areas and would be substantially lower than on the Mount Trumbull area. Therefore, fire severity in treated areas would be reduced and the risk of cheatgrass infestations may be reduced as well. One of the factors influencing weed populations in general is introductions new areas. The noxious weed FEIS (2005) provides mitigations to reduce the risks of new introductions such as vehicle cleaning and the use of certified weed free products. Additionally, forest plans for the Coconino and Kaibab National Forests have incorporated the direction of the FEIS, requiring noxious or invasive weeds to be considered in analysis project design and implementation. Design features and mitigation that has been developed to address noxious weeds includes (but is not limited to): (1) Survey roads to be closed or obliterated before the work begins and avoid Region 3 Sensitive plants if necessary. Avoid existing noxious or invasive weeds during soil disturbing activities associated with obliteration, (2) Place slash piles on previously used locations such as old piling sites, old log deck sites, or other disturbed sites to avoid severe disturbance to additional locations where possible, (3) Treat weed infestations within stands before implementing treatments, (4) Prevent spread of potential

and existing noxious or invasive weeds by vehicles used in management activities by washing vehicles and equipment prior to entering the project area and when moving from one area to another, (5) Incorporate the Best Management Practices for noxious or invasive weeds as listed in Appendix B of the Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds into all management actions, (6) Manage prescribed fires as an aid to control of existing weed infestations and to prevent the spread of existing weeds, and (7) Incorporate weed prevention and control into project layout, design, alternative evaluation and project decisions.

References:

McGlone, Christopher M and Dave Egan. 2009. The Role of Fire in the Establishment and Spread of Nonnative Plants in Arizona Ponderosa Pine Forests: A Review. *Journal of the Arizona-Nevada Academy of Science* 41(2):75-86.

McGlone, Christopher M, Judith D. Springer, Daniel C. Laughlin. 2009. Can pine forest restoration promote a diverse and abundant understory and simultaneously resist nonnative invasion? *Forest Ecology and Management* 258 (2009) 2638–2646

McGlone, Christopher M, Judith D. Springer and W. Wallace Covington. 2009. Cheatgrass Encroachment on a Ponderosa Pine Forest Ecological Restoration Project in Northern Arizona. *Ecological Restoration*. 27 (1); 37-46.

Comment #39-19: Forest Service must adequately consider the cumulative impacts of all past, present and reasonably foreseeable projects within and near the project area...scientific literature identifies livestock grazing as a major factor in the alteration of historic fire regimes and a contributor to fire hazard (Arnold 1950, Cooper 1960, Madany and West 1983, Mitchell and Freeman 1993, Rummell 1951, Savage and Swetnam 1994)...

Response: The key question in this comment appears to ask if, with on-going grazing, there would be movement towards restoring natural fire regime (a desired condition) or movement towards reducing the potential for crown fire and high intensity surface fire (a desired condition). The comment includes a question on if there would be excessive tree stocking density (as a result of continued ungulate grazing). The impacts from past and current grazing will be part of the existing condition or baseline for cumulative effects. How movement towards desired conditions would be affected by our proposed actions when combined with ongoing and foreseeable actions (such as ungulate grazing) will be evaluated as part of cumulative effects. Given past experience with similar projects (albeit at a much smaller scale) across the Coconino National Forest such as A-1, Dobber and Woody restoration projects, as well as the Wild Bill Study Area (located within an active grazing allotment), actions such as removing of a portion of the forested canopy and creating openings results in understory herbaceous response. Grazing (domestic and wild) does remove biomass (fuel) that can affect how fire can burn, but this project would also increase forage as overly dense areas are opened up, potentially reducing the relative impacts of grazing.

With maintenance burns, excessive tree stocking density is not anticipated. Ultimately, actions affecting grazing management (and suitability-related determinations) are outside the scope of this analysis. However, the proposed action will include design features for addressing post-fire grazing. Post-fire grazing may resume on allotments when soil and perennial plants, that are likely to be grazed will not be permanently damaged by livestock. The range management definition for this is range readiness. Plants are ready for grazing when at least one of the following characteristics is present: 1) seed heads or flowers, 2) multiple leaves or branches,

and/or 3) a root system that does not allow plants to be easily pulled from the ground. These characteristics provide evidence of plant recovery, high vigor and reproductive ability. 39-24/1: An old tree retention strategy has been developed to serve as a guide for the conservation of old (pre-settlement trees). The strategy focuses on retaining old, large trees that are currently under-represented on the landscape as compared to what was present historically. Every effort will be made to conserve old large pre-settlement trees by using characteristics described by Thompson (1940) as age class 3 (intermediate-mature) and age class 4 (mature-overmature). The values associated with old, large trees are different from those associated with large, young trees. Also see response # 39-16

Comment #39-20: Describe in detail how the Stand Density Index (SDI) will be used in developing treatment approaches....SDI was designed for use in even-aged management scenarios. The Proposed Action is planning on restoring an uneven-aged forest structure. How the use of SDI relates to ecological restoration goals remains unclear.

Response: How SDI was used to inform treatment approaches has been defined to greater extent in the proposed action.

Comment #39-21: Until the Forest Service has completed its re-initiated consultation with the U.S. Fish and Wildlife Service regarding impacts of implementing Land and Resource Management Plans in the region on Mexican spotted owl and other species, any projects implementing those Plans, including the Proposed Action, must avoid take...to avoid violating Section 7(d) and 9 of the ESA.

Response: Thank you for your comment. We are working closely with the region and USFWS. Given the scale of the project, there is likely to be some degree of take. The effects analysis will disclose all effects and the project will be compliant with Section 7a.2. of the ESA.

Comment #39-22: Identify soil types on which mechanical treatments, piling and pile burning should be prohibited owing to vulnerability to soil disturbance...Include mandatory procedures for preventing soil erosion during mechanical treatments...Not convinced that best management practices will prevent unacceptably detrimental soil conditions where ground-based log skidding occurs....Relate slope steepness to soil erosion hazard or soil structure throughout the project area; disclose exactly where ground based skidding and mechanical treatments may and should not occur..Evaluate soil erosion hazard at multiple scales, using watersheds and sub-watersheds to delineate between those scales.

Response: The vegetation and prescribed fire treatments were developed in full consideration of soil classifications and characteristics. Design features, in the shape of Best Management Practices, are in integral part of the refined proposed action.

Comment #39-23: Described savannahs, grassland and other ecological communities may or may not be Management Areas set forth...in forest plan...Describe the science and policy basis for those definitions.

Response: No new forest management areas are being created. Savannah treatments would occur within the ponderosa pine management area/geographic area and these treatments are consistent with the forest plan desired conditions for this vegetation type. Where grassland management areas are located within the analysis area, this distinction will be made as the analysis will reflect all pertinent forest plan direction (both forest-wide and management area/geographic area

direction). The Coconino forest plan specifically states, “To apply management practices or activities, managers will locate the practices or activities on management and analysis area maps and field check the location to determine the applicable standards and guidelines to be met. Then the suitability of applying the practices or activities is determined for that specific location. Practices or activities are monitored in accordance with Chapter 5, Monitoring Plan, to ensure compliance with costs, outputs, and standards and guidelines.

The transition between vegetative zones is highly variable. The variability results in isolated parcels of individual analysis areas that do not match the Forest map of management areas for which the standards and guidelines were written. In these instances, proposed practices or activities are governed by standards and guidelines from the management area description that most accurately depict the real situation on-the-ground (Coconino National Forest Plan, p. 47”).

Comment #39-24/1: Retain old growth trees regardless of size, as old growth is a function of age, not size. Old growth is not a definitive age. Ponderosa pines begin to develop the thick yellow bark characteristic of an old growth tree between 120 and 150 years of age.

Response: Every effort will be made to conserve old large pre-settlement trees by using characteristics described by Thompson (1940) as age class 3 (intermediate-mature) and age class 4 (mature-overmature). The values associated with old, large trees are different from those associated with large, young trees.

Comment #39-24/2: When creating openings, protect old growth...by removing excess competition from small, young trees...removal should focus on, but not be restricted to trees 12 inches in diameter and smaller...Thinning should occur within groups, as well as in identified openings between groups.

Response: Trees in the mature and old VSS class would be evaluated in relation to the surrounding trees and determine if they are a group, clump or individual tree. If an individual tree or a clump is within the rooting zone or matrix – all trees surrounding it that are outside of an adjacent group would be removed. If a clump is within a group or a group, we would follow stocking guidelines (based on dominant VSS class) for the group using the mature or old VSS class trees as the basis for the group size and shape.

Comment # 39-24/3: Reduce the fire risk to old growth trees by removing small, younger trees, as well as some mid-aged trees (VSS 4: 12 to 18 dbh) from within the drip lines of individual trees...focus on trees smaller than 16 inches in diameter...This would reduce ladder fuels, lowering the potential for crown fires. IT would also encourage the growth of the understory community.

Response: We agree with the premise of this statement, that is, it will most likely be younger trees that are acting as ladder fuels though, from a fire behavior assessment, fire behavior is generally assessed based on canopy base height rather than dbh or VSS class. Fire behavior/risk assessments use some, but not all of the same parameters as silvicultural assessments. Fire modeling software and fuel models do not use VSS classes. Canopy Base Height (cbh) is used as one of the primary canopy characteristics that initiate crown fire (passive or active), combined with surface fire intensity. Thinning can improve the vigor of old trees based on, among other things, competition, not just fire threat. Thinning around old trees may increase resource uptake and growth of old ponderosa pines by reducing water stress and can cause increases in constitutive resin defenses against bark beetle attacks (Kolb et al., 2007). Thinning and thinning

and burning have been shown to cause a long-term decrease in water competition and improved growth rates across the northern Arizona study sites (Zausen et al., 2005).

Comment #39-24/4: When developing future old growth stands and managing for mature age classes...VSS 4, 5, 6 should be retained to replace the structure and function of old growth trees that were removed by logging.

Response: See response #39-16 and #39-24-1.

Comment #39-24/5: To provide for uneven-aged structure within old growth stands, retain groups of young and mid-aged trees...for multiple age classes...and structural diversity. Thin variably...removing ladder fuels and avoiding even spacing.

Response: The proposed action is in alignment with this recommendation as our assumption is that the comment is referring to treatments within designated old growth.

Comment #39-24/6: Identify and retain areas that would be best left un-thinned for wildlife cover and...travel corridors.

Response: The proposed action is in alignment with this recommendation as the Forest Service worked closely with Arizona Game and Fish Department and the U.S. Fish and Wildlife Service to address habitat cover and corridor needs.

Comment #39-24/7: Preserve all snags...Downed logs with a diameter greater than 10" will be preserved.

Response: Snags and coarse woody debris (includes logs) would be managed to move towards forest plan requirements by not targeting the removal of snags, downed logs. Also see response #39-10.

Comment #39-24/8: Use prescribed fire and the management of natural ignitions to reduce ground fuels.

Response: Thank you for your comment. Prescribed fire is proposed as a tool to reduce ground fuels, as well as stimulate understory production, control reproduction and reduce potential for severe wildfires. How natural ignitions will be managed is not a decision to be made in this analysis as that is a case-by-case line officer decision. However, treatments are expected to provide opportunities for managing future unplanned ignitions. This will be addressed in the fire effects analysis. The proposed action does include mechanical thinning in addition to hand thinning. However, removing all slash created during thinning treatments without the use of prescribed fire would not be not feasible. Leaving a high volume of slash would mean fire remains a potential threat. Thinning and prescribed fire are the key tools needed to manage forest fuels to prevent impacts to safety and health from uncontrollable wildfires (Allen et al 2002)

Comment #39-24/9: Defer livestock grazing...after initial fire treatment to allow for understory recovery...change grazing management to allow for function of natural processes.

Response: A design feature has been built into the proposed action to address post-fire livestock grazing. Post-fire grazing may resume on allotments when soil and perennial plants, that are likely to be grazed will not be permanently damaged by livestock. The range management definition for this is range readiness. Plants are ready for grazing when at least one of the

following characteristics is present: 1) seed heads or flowers, 2) multiple leaves or branches, and/or 3) a root system that does not allow plants to be easily pulled from the ground. These characteristics provide evidence of plant recovery, high vigor and reproductive ability.

Comment #39-24/10: Decrease road densities to enhance stand integrity by reclaiming old skid trails and log landings.

Response: This analysis is not making decisions on the transportation network that would affect forest road densities. Skid trails and landings are not calculated in determining the road density for a forest. The proposed action includes using existing/remnant roads, skid trails and landings. BMPs have been included to minimize the impacts of skid trails and landings.

Comment #39-25: Support a 16" diameter limit for tree cutting...Support a 16" diameter threshold for exceptions for large tree retention...The exception threshold is not a strict diameter limit; rather, it limits the cutting of young trees larger than 16" diameter to circumstances and criteria set forth in exception categories in the 4FRI Large Tree Retention Strategy. In those cases...support leaving those large, young trees on site...as logs, snags and for soil stabilization.

Response: See response #47-3.

Comment #39-26: Conservation of trees larger than 16 inches diameter is central to restoration of ecosystem structure, composition and function...Cutting and removal of large-diameter trees consistency proves to be a deal-breaker for many stakeholder(s)...suggest that adopting a diameter cap will expedite fuels reduction and forest restoration...Please refer to the series of Forest Service reports on Small Diameter Success Stories (Livingston 2004, 2006, 2008) demonstrating social consensus and market opportunities for stewardship activities, including the White Mountain Stewardship project, focused on small-diameter thinning as a vital element of hazardous fuels reduction and ecological restoration.

Response: A vital element of restoration is to have an uneven age structure with a balance of age classes and to manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape. This project's desired conditions are based on this concept and treatments are designed to move towards desired conditions. A 16" diameter cap would ensure that all trees 16" and larger would be maintained but it would not ensure that the desired conditions would be met.

From a fire perspective, with the possible exception of the diameter specifics, we agree that it will most likely be younger trees that are acting as ladder fuels. However, from a fire behavior assessment perspective, fire behavior is generally assessed based on canopy base height rather than dbh or VSS class. Fire behavior/risk assessments use some, but not all of the same parameters as silvicultural assessments. Fire modeling software and fuel models do not use VSS classes. Canopy Base Height (cbh) is used as one of the primary canopy characteristics that initiate crown fire (passive or active), combined with surface fire intensity. Thinning can improve the vigor of old trees based on, among other things, competition, not just fire threat. Thinning around old trees may increase resource uptake and growth of old ponderosa pines by reducing water stress and can cause increases in constitutive resin defenses against bark beetle attacks (Kolb et al 2007). Thinning and thinning and burning have been shown to cause a long-term decrease in water competition and improved growth rates across the northern Arizona study sites (Zausen et al 2005).

Comment # 39-27: Openings within and between groups that were created by the logging of pre-settlement trees, or larger trees established close to disruption of the nature fire regime should not be considered openings to be maintained over time. Given the high number of these logged openings, their impacts should be considered when evaluating the creation of new openings. This should apply to all spatial scales.

Response: The intent of the project is not to remove pre-settlement trees (see response #39-24/1). Groups would be established using evidence based science as one of the tools and the refined proposed action reflects using a "read the land," approach to evaluate where the existing openings are and build off of this evidence. Some newly created openings are part of the proposal. Existing openings would be evaluated in relation to group placement and determine if they would fit into the rooting zone. The rooting zone is the area beyond tree crowns that is occupied by tree roots. These areas which are located between tree clumps are free of trees and are occupied by the roots of trees within the clump/group), matrix (additional open area (inter-group space) beyond the rooting zone composed of few or no trees) or have potential for natural regeneration.

Comment #38-1: Baker (2006), using a fire history reconstruction approach from plot data in PP forests of northern Arizona, concluded that historic high-intensity rotations were approximately 300-400 years.....Rhodes and Baker (2008) using Forest Service BAER severity data to estimate high intensity rotations in various parts of the U.S. west concluded that current high intensity rotations in SW forests is about 625 years.

Response: Rhodes and Baker discuss the probability of high intensity fire, and fire rotation, neither of which is synonymous with fire return interval. Because it was/is rare, of course the return interval for it is long. The reference to the fire rotation for high intensity fire historically having been 300 - 400 years is in keeping with other research indicating it was rare in ponderosa pine. There are several references in this paper to the decreased frequency of fire in ponderosa pine, clearly inferring the historic fire regime to have been frequent fire. Baker (2006) does not separate ponderosa pine from other conifer vegetative types in the calculation of fire rotation...a measure which, again, is not synonymous with fire return intervals. Fule et al. (2006) concluded that in Baker (2006), (1) FR was improperly calculated because it did not distinguish fires burning in the ponderosa pine study areas from other adjacent vegetation types; (2) the correction factors rest on mutually contradictory assumptions, illustrating the practical difficulty of combining FR and FI calculations in ecosystems characterized by surface fires; and (3) the FR is not appropriate for the disjunct fires in one of the Grand Canyon study areas, showing that detailed information about fire history is more valuable than summary statistics.

Comment #38-2: Potential fire intensity can be very effectively reduced with an upper diameter limit of about 8 inches in diameter at breast height (Omi and Martinson 2002, Martinson and Omi 2003), Strom and Fule 2007). This is regardless of the pre-thinning basal area density of the stands (Martinson and Omi 2003). There is no justification, ecologically, for thinning of trees up to 16 inches...or larger and such action would only unnecessarily reduce forest canopy cover and reduce potential for natural recruitment of ecologically vital large snags through competition mortality....

Response: It is not clear where the 8" number came from. None of the papers cited suggest that 8" is an ideal (or otherwise) dbh to use for anything. Martinson and Omi 2003 do not discuss the size of trees that were cut, they state, "We chose a narrow definition of fuel treatment that included only non-commercial or pre-commercial activities involving mechanical thinning (i.e.,

“low thinning”), debris removal, and/or broadcast burning with moderation of wildfire potential as a stated objective.” Additionally, this project is about restoration, not just fuels reduction, though there is certainly an overlap. Omi and Martinson (2002) make no mention of any dbh recommendations, but provide data to support the benefits of thinning and burning as an effective method of decreasing potential fire behavior and effects. They do determine that average dbh for an area may be an indication of resistance of fire resistance to stand damage, but there are no references to a specific recommendation on dbh size. They show average diameters and use that as a potential indicator for fire resistance, but there are no specific recommendations for effective average diameter. Strom and Fule (2007) make no mention of dbh based thinning prescriptions, other than discussing some of the even-aged thinning that was done prior to Rodeo-Chediski (fire). The 4 Forest Restoration Initiative is about restoring ponderosa pine forests, it is not a fuels reduction project. Most of the cited references are related to fuels rather than restoration and, though there are many similarities, restoration thinning would not be evenly spaced, as presented in some of the literature cited here. The structure of the entire forest – vertically and horizontally is being addressed, not just fire hazard. There is heterogeneity within the forest as well, so there would be no ‘one size fits all’ prescription for fire or mechanical treatments. Thinning of both canopy and ladder fuels is generally needed to reduce crown fire potential (ERI Working Paper #15 “Effects of Forest Thinning Treatments on Fire Behavior” Feb 2006).

Comment #38-3: ...Very few cases in which prescribed fire cannot be used in lieu of thinning. ...Even if some site-specific case can be found where prescribed fire is unwarranted (perhaps adjacent to homes, for example), I recommend that the small-diameter thinning of trees up to 8 inches dbh be done via a non-commercial service contract in which the thinned trees are not removed as commercial product - either for sawtimber or biomass...Options for the material...piling and burning, mastication followed by burning, or removal for personal use permits for firewood or fence materials.

Response: The author gives no justification for his objection to selling thinned trees of any size and, if there’s a market for the wood being thinned as a part of the restoration, it’s illogical not to take advantage of that.

Prescribed burning is limited as a first entry fuels treatment because of heavy accumulations of surface and ladder fuels. In most cases, other mechanical treatments are needed prior to prescribed burning in order to reduce fuels to a level that prescribed burning can be used in subsequent treatments without undue damage to the residual stand. Preparatory treatments, such as mowing, pruning, and thinning, improve fire control and safety, reduce the risk of escape, reduce damage to residual trees, and significantly reduce the level of smoke production and effects on air quality and human health in nearby communities. Treatments that combine thinning with prescribed fire and that focus attention on a wide range of post-treatment conditions (including herbaceous vegetation, wildlife habitat, watershed benefits, and recreation) do the best job of reducing fire danger and improving forest health in the long term (Covington et al. 2001; Omi and Martinson 2004).

There are tens of thousands of acres within the project area that are being proposed for ‘fire only’ treatments, of which many thousands are in forested stands. Those exact numbers are in the process of being refined. It is possible to use fire for thinning in some areas, and that will be part of the proposed action. However, to propose that we do ALL – or even most – of the thinning that needs to be done with fire would doom the project because of:

- Smoke restrictions: We are expecting to increase smoke production to the limit of what is allowed by the Arizona Department of Environmental Quality. Initial entry burns into areas that have not burned for a long time will produce a great deal more smoke from the first and second burns than in subsequent burns. Attempting to do it all with burning would slow the project down to an ineffective rate of treatment, leaving the majority of the project area at increasing risk of uncharacteristic fire, and degrading forest health.
- When using prescribed fire as a tool to kill ponderosa pine saplings, the amount of damage and associated fire behavior required to successfully kill a sapling-sized ponderosa pine can also result in undesirable fire effects on the overstory trees. There is a danger of the fire being carried into the overstory canopy and escaping or high cambium damage, both resulting in overstory mortality (Battaglia, Smith and Shepperd, 2009).
- Even trees as small as 10 cm dbh can be highly resistant to prescribed fire, and techniques that increased fire intensity, such as ring firing, may lead to higher mortality of small trees, but may be hard to apply in the presence of continuous vertical fuels. Additional complications occur with the need for dry conditions, and the desire to protect old-growth trees from excessive scorch (Harrington & Sackett, 1990).
- Treatments that combine thinning with prescribed fire and that focus attention on a wide range of post-treatment conditions (including herbaceous vegetation, wildlife habitat, watershed benefits, and recreation) do the best job of reducing fire danger and improving forest health in the long term (Covington et al. 2001; Omi and Martinson 2004). Restoration treatments that focus on healthy forest structure allow low-severity fire to easily and inexpensively shape forest conditions in the future – and this, in turn, reduces the need for future maintenance thinning.
- Fires severe enough to thin 25 – 35 cm dbh pines are likely to crown in unthinned stands and would be difficult to manage under any circumstances. (Miller and Urban, 2000).
- Fire is indiscriminate, and it is not at all certain that the structure left after thinning with fire would set the burned area on a trajectory towards restoration. Objections to mechanical ‘cutting’ of the ‘wrong’ trees much apply to fire as well as mechanical treatments.
- Thinning effectively with a restoration objective – where it is possible to, would take repeated burns. Sufficient time would have to pass between burns to allow surface fuels to re-accumulate to the degree that the next fire could meet

objectives. If the objective is to kill trees larger than seedlings, it could take several years between fires, though much would depend on precipitation.

Comment #38-4: .Scoping notice assumes that, with increasing time since fire...i.e., higher levels of missed fire return intervals relative to the natural, historic fire return intervals- fire intensity will substantially increase and high -intensity fire predominates in higher FRCC areas. The empirical data contradicts this assumption (Odion et al. 2004, Odion and Hanson 2006, Odion and Handon 2008, Odion et al. 2010)(once again) please see my report, "The Myth of Catastrophic Wildfire" at JMP's website, www.johnmuirproject.org, for citations).

Response: Understanding, maintaining and restoring ecosystems requires some level of "base datum" for understanding how the land functions in a healthy condition - reference conditions (Fule et al., 1997; Swetnam et al., 1999). There are a multitude of studies specific to southwest ponderosa pine and to the Coconino/Kaibab spanning the last six decades. These studies show that the fire regime in southwestern ponderosa pine was a frequent fire return interval of low intensity surface fire. That does not necessarily mean there was no crown fire, but it was the exception. Additionally, it is/was the effects of land management (including fire suppression) over the last century that allowed the forest structure to become unnaturally dense, resulting in the potential for large, high intensity fires over large areas (Allen et al., 2002; Cooper, 1960; Covington and Moore, 1994; Fule et al., 1997; Fule et al., 2001; Heinlein et al., 2005; Mast et al., 1999; Savage and Mast, 2005; Weaver, 1951). Estimates of the fire return interval in the project area range from 2 to 22 years (Dietrich and Swetnam, 1998; Fule et al., 1997; Fule et al., 2003; Swetnam, 1990; Swetnam and Baison, 1996; Van Horne and Fule, 2006). We were unable to find all the Odion references listed (all that was included in the comment letter was the name and the year). However, in Odion and Hanson 2008, there is no specificity in terms of the types of forest. 'Conifer' forests are not all equal in fire regimes, so the information in that paper is irrelevant and it incorrectly infers that, in effect, all conifer forests can be classified together regarding fire regimes. Odion et al (2004) discusses fire in northern California. Ponderosa pine has distinct variability's within its geographic range (refer to Oliver, W.W. and R.A. Ryker. 1990. Pinus ponderosa. Pp. 413-424 in R.M. Burns and B.H. Honkala (technical coordinators) Silvics of North America, Vol. 1. Agri. Handbook 654, USDA For. Serv., Washington, D.C.), and the populations of ponderosa pine in northern Arizona have some fundamental genetic differences (Conkle and Critchfield, 1988 Genetic Variation and Hybridization of Ponderosa Pine' in Symposium Proceedings: Myth #3: '...most fires are currently dominated by high-intensity effects...'. This is an overgeneralization. As in other papers presented and a portion of this paper, the conclusions in this section are not well supported in the literature as applied to those ecosystems within the project area. In Myth #4, the first page the word 'ponderosa' appears in on pg. 13. All conifers were lumped together which effectively negated a discussion on fire regimes in ponderosa pine. In Myth #5 there is some misleading information and interpretation of facts. We agree there is too little fire on the landscape today, including high intensity fire. On pages 15 and 17, ponderosa pine is mentioned. However, on page 15, it is a reference to ponderosa pine in Oregon that has different genetics and different system than the ponderosa pine that is within the analysis area. On page 17, there is a reference to southwestern ponderosa pine. Rhodes and Baker refer several times to the high frequency of fire in ponderosa pine and the probability of high intensity fire is, thus the long rotation for any given area to experience high intensity fire. We agree that there is far less fire on the landscape than there was historically - including all types of

fire. There are no more references to ponderosa pine in this paper. It is overly general to be pertinent to this proposed action.

Comment #37-1: .Realistic number for debris- litter-mulch for the material < 3 inches, which would mimic pre-settlement condition...relative to fine fuels on the ground pre-settlement to carry natural fires

Response: Scott and Bergen (GTR 153 2005) found that 0.4 tons/acre for GR1 will carry fire in short grass fuel type; 1.1 tons/acre will carry fuel in a low load dry grass system (GR2); 2.15 tons/acre in a moderate grass/dry climate (GR4) fuel model. These are not "pre-settlement" fuel loads but are the minimum amount of fuels necessary to carry fuels in these fuel model types.

A realistic estimate of fine litter (i.e., excluding downed coarse woody material such as tree boles and limbs) that would mimic pre-settlement conditions would be range from approximately 900-3,500 lbs. per acre. This includes available forage, pine needles, twigs, cones, etc. Ground cover as fine fuels is strongly correlated with tree canopy cover (Cooper 1960 provides an excellent review).

It is important to understand that pre-settlement forest conditions were much more open with herbaceous understory's that contributed to mollic soil epipedons or taxa. Fine fuels and standing grasses carried surface fires – not fine fuels alone in most cases. Also, it is reasonable to expect that the fine litter component of soils was quite variable and dependent upon available moisture and wildfire return frequency.

There is minimal range condition information is available before 1935 (GTES, 1991). However the GTES indicates from 1902 – 1987 that as more livestock numbers and acres were grazed, range condition (and therefore soil condition) declined, and as fewer livestock and acres were grazed, range condition and trend improved. Domestic livestock grazing was not present historically (i.e. before European settlement) and therefore did contribute to rangeland and soils degradation. One report described that most of the forest lands in the arid regions had been heavily overgrazed when the National Forests were established (Box, 1977). According to Gori and Bates (2007) livestock and large wildlife grazing removes fine fuels needed to carry surface and mixed-severity fires that likely maintained the more open structure and composition of pinyon-juniper savannas and shrub woodlands historically. Fire history reconstructions collected at a limited number of sites (representing these piñon-juniper types) show the virtual elimination of surface and/or mixed severity fire as a disturbance agent after 1880 when livestock numbers increased over most of Arizona and New Mexico. Merriam elk did exist but are believed to occur in relatively low populations and therefore did not appreciably affect soil loss. North American bison and elk were known to graze and were reported to denude grass in some areas, however, grasslands in Arizona are not considered to have been developed with bison as a factor in maintenance of the grasslands (Truett, 1996).

Comment # 36-1: Why now?

Response: Historically, the ponderosa pine forest within the analysis area was a mosaic of grassy opening and interspaces with trees arranged in groups and clumps. All tree size classes (an uneven aged structure) were present. Re-occurring low-intensity fire maintained this mosaic. Under these conditions, the forest had faunal diversity and resiliency to fire and other natural disturbances. Today, a lack of re-occurring fire has resulted in a proliferation of smaller trees that have reduced or entirely replaced openings and interspaces that are important to wildlife and the

health of the forest. There is a lack of age and size class diversity and the forest has moved towards an even-aged structure. Dense stand of young, small trees have reduced tree growth and health to the point there is a high risk of losing trees that are in the mid to large size classes. Reduced forest health and the lack of diversity have resulted in a forest that is less resilient to the damaging effects of drought, insect and disease, and intense wildfire. The desired condition is to move towards an uneven-aged forest structure with all size classes represented. A mosaic of grassy openings and tree groups of varying sizes and shapes (groups and clumps) is present and maintained primarily with fire. The numbers of trees are reduced to allow for individual tree growth, vigor, and increased understory grass and forbs production. There is a need to improve forest structure and maintain the forest mosaic with frequent, low intensity fire. There is a need to implement the forest plan which states, "Manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape" (USDA Forest Service 1987, as amended).

Vegetation diversity throughout the analysis area has declined. A lack of fire has allowed Gambel oak, an important habitat component, to become outcompeted by fast growing ponderosa pine. Ponderosa pine has been growing unimpeded since the disruption of fire. Aspen, a species that provides for habitat diversity, is dying or dead due to the combined effects of conifer encroachment, browsing, insect, disease, severe weather events, and lack of fire disturbance (USDA Forest Service 2008) (USDA Forest Service 2009). The desired condition is to have Gambel oak and aspen present and reproducing. Natural disturbance processes such as fire maintains the oak and aspen component within ponderosa pine systems. There is a need to maintain and promote Gambel oak by removing ponderosa pine competition, stimulating new growth and maintaining growth in large diameter trees. Where possible, there is a need to regenerate aspen by removing ponderosa pine competition, stimulating growth and increasing individual recruitment.

Grasslands (which includes wet and dry meadows), which were once found throughout the analysis area, have shifted to woody vegetation as a result of tree encroachment (USDA Forest Service 2008) (USDA Forest Service 2009). Grasslands provide valuable habitat to many wildlife species including pronghorn antelope, birds and small mammals. The desired condition is to restore the historic patterns of trees within grasslands. There is a need to reduce/remove tree encroachment from historic grasslands. To maintain Gambel oak, aspen and grasslands, there is a need to reduce canopy density by thinning ponderosa pine encroachment.

Fire regimes in the analysis area have shifted from frequent, low-intensity surface fires (Fire Regime Condition Class (FRCC I) to lower frequency, high-intensity crown fires (FRCC III). FRCC III indicates high departure from reference conditions and indicates there is potential to sustain a crown fire and high-intensity surface fire. The desired condition is to have the majority of the analysis area in FRCC I. There is a need to reduce the potential for crown fire and high intensity surface fire. In order to maintain grassy openings and interspaces between trees (as well as promote Gambel oak and aspen), there is a need to move towards having frequent fires that burn with low to mixed severity in 0 to 35 year intervals across most of the analysis area. There is a need to strategically place treatments to reduce the effects of high intensity and high severity wildfire on resources such as sensitive wildlife habitat and the urban interface.

Riparian systems on the Coconino portion of the analysis area have shifted from having large trees with open canopies to small and medium trees with closed canopies. Understory vegetation has been reduced (USDA Forest Service 2009). The desired condition is to promote large trees

and understory vegetation. There is a need to reduce tree encroachment and increase/maintain grasses, forbs and woody vegetation.

This project would take opportunities to restore riparian features such as springs and seeps. There is a lack of recharge in the aquifers associated with these features due to drought, lack of fire, and closed forest canopies which increase evapotranspiration. Excessive disturbance can result in these features becoming non-functional (USDA Forest Service 2008) (USDA Forest Service 2009). The desired condition is to maintain or restore functionality. In order to restore functionality, there is a need to reduce tree encroachment, maintain these features through natural processes, and limit future disturbance where possible and practical.

Throughout the analysis area, dry ephemeral channels have been degraded by past actions. Some channels are heavily eroded with excessive bare ground, denuded vegetation and head cuts. The desired condition is to have fully functioning ephemeral channels to promote the establishment of native vegetation and have reduced sediment flows. There is a need to restore channels to a functioning condition that more closely resembles their natural condition. Throughout the analysis area, there are closed roads² and unauthorized user-created routes present. Some road prisms, which were identified for closure in other environmental analyses, are eroding and contributing sediment. Sediment can impact water resources and watershed function. In some cases, the roads and user-created routes are inhibiting the long-term establishment and retention of trees and ground-cover. The desired condition is to return road prisms (as possible and practical) to their natural condition. There is a need to promote and maintain vegetation re-establishment and physically preclude future motorized use on select closed roads and user-created routes

Comment #36-2: How did this problem get so big...why were these issues not addressed years ago?

Response: See response 47-3

Comment #35: Email with Submittal of stakeholder created Old Growth Protection and Large Tree Retention Strategy

Response: See response 47-3.

Comment #34-1: We are concerned the current PA does not provide sufficient detail about the proposed action.

Response: Thank you for your comment. As we discussed throughout the public meetings from January 20th to February 24th, the refined proposed action includes additional detail (what/where/when/how).

² This analysis would does not make decisions on what roads would be open or closed, nor would this analysis make decisions on cross country motorized travel. Decisions regarding the forest's transportation network, including closed roads, have been made in other environmental analyses. The purpose of this analysis is to disclose the effects of preventing motorized travel on select closed roads and unauthorized user-created routes.

Comment #34-2: It is unclear what method will be used to identify and configure strategic treatments. The stakeholder group proposed configuration by firescape...More clarity is needed....We request more clarity with regard to how the strategic placement of treatments will interface with planned and unplanned ignitions.

Response: See response 39-7.

Comment #34-3: The stakeholder group has clearly stated that no old growth trees (pre-dating Euro-American settlement or currently exhibiting old growth structural characteristics) should be cut...PA does not provide sufficient assurance that old growth will be protected.

Response: See response # 39-24/1.

Comment #34-4: The PA is silent with regard to how unplanned ignitions will be used as a management tool...greater detail is needed.

Response: See response 39-24/8

Comment #34-5: The Stakeholder Group believes ecological restoration should guide, and be the goal of the 4FRI. The project summary states that the goal of the project is to re-establish forest structure, pattern and function, which will lead to increased forest resiliency. It then suggests actions that are traditional silvicultural treatments without specifying how they will use ecological science to frame action and achieve desired ecological conditions. It does not explicitly tie the goal of the 4FRI to historic conditions, natural range of variability, or clarify how forest resiliency and function will be accomplished at the landscape scale. The Forest Service Handbook FSM 2000/Chapter 2020/Effective date 09/22/2008 provides foundational policy for using ecological restoration to manage National Forest System lands in a sustainable manner. Using the definition of ecological restoration² from the Handbook would make the goal of this project crystal clear and tie it to the legal framework that supports it.

Response: Thank you for your comment. We agree and will incorporate your recommendations.

Comment #34-6: The PA is silent on the relationship of the 4FRI to economics and utilization. The Stakeholder Group believes that ecological restoration and economic utilization must be mutually supporting and that landscape-scale restoration cannot be accomplished without private sector harvest, utilization, and marketing. It is a fundamental vision of the 4FRI that landscape-scale restoration should support sustainable forest industries and vibrant rural communities. The stakeholders would like to see a commitment to this goal.

Response: See Response # 43-2

Comment #34-7: In order to develop a robust monitoring framework additional detail about the ranges of measurable forest variables for the various Desired Future Conditions will be necessary if the monitoring program is to have sufficient power to assess whether or not management objectives are being met....Given the 4FRI's commitment to being a science-based endeavor we would ask that the Forest Service help cultivate an atmosphere that is conducive to research being conducted by a variety of partners.

Response: We agree. The purpose and need and proposed action include additional detail needed to support both the use of adaptive management and monitoring. A robust monitoring plan is a high (and immediate) priority. We look forward to working with you on this task. As we develop

the monitoring plan, opportunities for research can be discussed. However, we will not require research as a monitoring activity. Required monitoring within the EIS will be tied to forest plan monitoring needs. In addition, we are looking towards a multi-party monitoring approach, of which we would hope that the Stakeholder group would be an active participant.

Comment #34-8: Adaptive management requires explicit statement of goals and objectives, and a well-informed monitoring program that has the requisite power to detect management impacts rapidly enough to inform future management. Furthermore, adaptive management is a structured decision-making process that relies on clearly articulated triggers for management change. Finally, adaptive management requires a commitment to change management when monitoring data indicates that the thresholds identified by those triggers have been crossed.

Response: We agree. The refined PA includes adaptive management. Having clear desired conditions that are the foundation on which to build possible management actions and the quantitative/qualitative measures that indicate additional management change is needed (a temporal and spatial relationship) are being refined and will be displayed in the draft EIS.

Comment #33: Duplicate of Letter #49

Comment #32-1: In general, we are very supportive of the proposal, and support the 4FRI collaborative group through our participation in the steering committee, in several working groups, and recently through signing the Memorandum of Understanding between the USFS and 4FRI entities.

Response: Thank you for your comment. We look forward to continue working with The Nature Conservancy.

Comment #32-2: We agree that the strategic placement of treatments affords an opportunity for managers to meet multiple objectives synergistically while optimizing the return on investment. We are very interested in continuing to provide scientific information to inform this process through inclusion of model outputs, historical range of variation data, and climate change and wildlife habitat analyses.

Response: Thank you for your comment. We look forward to continue working with The Nature Conservancy.

Comment #32-3: We encourage the USFS to continue being adaptive in all areas of management, including: prioritization of treatments, scenarios analyzed in NEPA, design and implementation of prescriptions, using economic data in designing contracts, and evaluation of post-treatment data and its incorporation into subsequent actions. We will continue to work with the USFS in the design and implementation of processes that allow the agency to respond quickly to rapid change and uncertainty.

Response: Thank you for your comment. We look forward to continue working with The Nature Conservancy.

Comment #32-4: We look forward to continued collaboration on how these data will be integrated with an improved understanding of values-at risk in designing more detailed treatment scenarios (size and type) that optimize placement to meet multiple objectives while minimizing

treatment costs. We think that many within the stakeholder group agree with the USFS that this objective is critically important to achieving 4FRI goals in a cost effective manner.

Response: Thank you for your comment.

Comment #31-1: Duplicate of Letter #42.

Comment #30-1: Provide (In Writing) an integrated plan / explanation to how it will combine: Scott & Burgan, the aspect where there is enough fuel to carry a "natural-ground fire" 477; where there is large woody material greater than 3 inches in diameter; FSH 2209.90 grazing of non-native species and yet leave enough material to carry the fire described in Scott & Burgan and not remove the needed debris described in 477; FSH 2509.18 - 2.05 "Litter, Organic material on the soil surface that are at least 1.25 cm (0.5 inches) thick. This includes needles, leaves and all woody material." discussions of this point is a merging of 477 and 2509.18. this alone is a key element to provide all the things this mulch / ground cover provides including but not limited to: soil protection & cooling & top soil development, erosion, food and cover for small species, setting of seeds for the distribution and diversity of small plants as well as watershed improvements of yield and protection,,,,,,,,, AND help carry the next fire.

Response: In terms of soil and water resources, specific BMP's designed to maintain long-term soil productivity (3"+ material) will be part of the proposed action. The soil and water effects analysis will describe the amount of ground disturbance expected from mechanized activities, as well as the amount of ground disturbance from prescribed fire. The maintenance of grass necessary to carry fire will require coordination between fire managers and range permittees during the implementation phase of the project. In terms of fire, proposed treatments would allow fire to burn as it did historically. In some places, it would burn in patchy patterns and in other areas it would burn in a more contiguous manner. In areas where surface vegetation has been suppressed by shading and/or excessive litter and duff buildups, it may take a few years for vegetation to become established, even after thinning and burning. Litter and duff, which are components of the pine ecosystems, would come and go with fire cycles. Currently, these layers are unnaturally thick in much of the analysis area, and fire is the only practical tool to reduce it to healthy levels. Excessive litter buildup is detrimental to soil and surface vegetation. It suppresses surface vegetation which, in turn, results in decreased soil health. A litter layer that fluctuates with fire cycles is what would be natural and healthy to these pine forests. In some years, there would be little to no litter, though the roughness provided by burned off grass leaves and culms can have some effect and minimize erosion, as can needle drop following fire. The proposed treatments are expected to increase surface vegetative cover in areas where it is currently suppressed. What response would be expected will be part of the environmental consequences in the DEIS. The cumulative effects analysis will acknowledge that grazing helped create the existing condition (baseline) and we will analyze the expected effects from the actions proposed in this project when combined with the expected range management. Grazing management decisions (authorized livestock numbers, approved pastures, season of use, etc is outside of the scope of this project).

Comment #29: I support controlled burnings for all of the above. I also believe in the multi-use of our National Forests. All of the above site multi-use except correct logging and grazing of cattle. We should punish those that abuse our roads instead of closing the roads.

Response: Thank you for your comment. The travel management EIS (as well as previous decisions) have determined which roads would be open for general public use. This analysis will

not make road closure decisions and would only propose decommission or obliteration on those closed roads that have been already identified for decommission or obliteration.

Comment #28-1: The current proposed action does not provide sufficient detail about the...initiative and management actions to occur over the next 10 years....Many stakeholders...spent much time...developing a landscape strategy..to assist in describing the purpose and need for the proposed action...incorporate these documents into the public process...to ensure recommendations...are clear to other interested parties.

Response: See response #41-3.

Comment #28-2: .There is no ecological need to cut these trees (old growth trees and forests) to conduct restoration, and efforts should be made to ensure the public is aware of the intent to protect old-growth forests across the project areas...Recommend the DEIS explicitly state no old-growth trees (trees pre-dating Euro-American settlement) shall be cut.

Response: See Response #53-12

Comment #28-3: Recommend the DEIS clearly describe the foundational science upon which restoration will occur within the project area (forests, ephemeral channels, aquifer recharge); articulate the specific post-treatment desired conditions...depict longer term desired future conditions for the...forest.

Response: We agree.

Comment #28-4: "The proposed action will cut trees within select Mexican spotted owl PACs to improve habitat. This statement does not accurately describe the detailed planning the two agencies are conducting to improve...owl nesting and roosting habitat along with forest management (thinning and burning) and monitoring activities to increase the sustainability of existing core activity areas...continue to work with FWS staff to develop language for the DEIS to clearly articulate the process, planning and monitoring needed to assist the species' recovery within the project area.

Response: The referenced statement in the initial Proposed Action (PA) was intended to identify that treatments would be proposed inside Mexican spotted owl Protected Activity Centers (PACs) and mechanical treatments are typically the most controversial. The intent was to inform the public and allow for responses to the proposed action. The statement by the US Fish and Wildlife Service is absolutely correct. However, to date only limited discussions have occurred regarding details of treatments. A lot of discussion has happened regarding the intent of treatments within PACs (e.g., improve nesting and roosting habitat, release oak, aspen, large diameter trees, and reduce fire threat while meeting the above objectives) and discussions are planned to develop more details regarding treatment strategy and actual prescriptions which will include fire as well as mechanical vegetation management. Once this synthesis occurs more detail can be provided in the final PA.

Comment #28-5: Recommend all future documents describing the proposed project include information regarding wildlife corridors by the FWS and Arizona Game and Fish Department.

Response: The coordination with the Arizona Game and Fish Department regarding corridors had not occurred at the time the initial PA was released and a final map and metadata had not yet been

received by the Forest Service. Meetings between these agencies have since occurred, final products have been shared with the Forest Service, and the integration of proposed corridors with potential treatment designations has been completed. This will be described in the revised PA.

Comment #28-6: There is a need to develop a robust monitoring framework...Recommend the Forest Service work with the stakeholder group to develop specific desired conditions for each restoration element...clearly articulate triggers for management change, and ensure the adaptive management strategy identifies a process for modifying management actions when objectives are not met.

Response: We agree and look forward to working with the agency on this task.

Comment #27-1: Support the recent discussion regarding the Schultz Creek and Ft Valley areas (Rio de Flag Watershed - RFW)...makes sense from both an ecological and social stand point.

Response: Thank you for submitting comments.

Comment #27-2: The RFW is especially important to the Flagstaff community; the resulting flooding following a severe wildfire...catastrophic to the City and those from the surrounding area who work, shop, or otherwise depend on city services and infrastructure.

Response: We agree.

Comment #27-3: The Ft. Valley area was our first focus area, dating back to 1998-2000. NEPA planning was completed and some initial treatments were completed. Expansion of past forest treatments and their on-going maintenance is important.

Response: General comment

Comment #27-4: Our CWPP.....clearly identifies the RFW as a priority area for future treatments.

Response: CWPP's have been reviewed to assure the proposed is consistent with these plans.

Comment #27-5: We recognize that differences exist between the Interface Zone of the CWPP and the Community Management Protection Areas as defined in the Woody Supply study and utilized in the Landscape Restoration Strategy...The former were identified using a matrix of six overlapping criteria and the later to determine potential wood volumes, the former were adopted by the community at large with a goal of protection, while the later was done so by a stakeholder group focused on a larger landscape and for a different purpose....Joint focus should be toward restoration of the watershed as a whole - to address its protection, enhancement, and resiliency.

Response: We agree. The proposed action is focused on restoration and moving toward desired conditions that would better protect and enhance watersheds and make them more resilient to natural disturbances, including fire. Evans et al (2011) found that "Ecological restoration in ponderosa pine forests has become a common objective and often dovetails well with wildfire hazard reduction objectives." That is not always/often the case in other fire regimes, but for the 4FRI analysis area, probably the most significant difference between a traditional 'fuels treatment' and a 'restoration treatment' are the spacing of trees (even-aged versus groupy/clumpy) and the diversity of VSS classes.

Comment #26: Can I be on the list for the scoping letter that is to come?

Response: Thank you. Your name has been added to our mailing list.

Comment# 25-1: I am requesting the FS include in their study the amount of cesium 137 and strontium 90 that will be released into the air from the burning....When we burn this vegetation we are directly responsible for exposing downwinders that still live in northern Arizona to the same cesium 137 and strontium 90 that the Department of Energy through their RESEP program is currently paying \$50,000 per cancer related cases...Exposing downwinders to the same clearly established deadly isotopes.

Response: Thank you for your comment. Our air quality specialist will research your concern and provide a response.

Comment #24: I strongly support and advocate for the cleaning and thinning of the forest areas.\

Response: Thank you for your comment.

Comment #23: This whole project is lip service for the FS...In past years, Snowflake has borne the brunt of relentless smoke from uncaring government groups. The problem is when they decide to control burn (you don't know until it's too late to leave the area), there is NO collaboration between the 7 national forests in Arizona. On any given day, we receive smoke from 14 different fires plus smoke from unattended lightening strikes. Arizona has 8 million acres of forests, busting at the seams, growing as we speak your efforts are a drop in the bucket, producing horrific health problems for many.

Response: Thank you for your comment. How smoke could potentially affect the community of Snowflake, AZ will be evaluated and displayed in this analysis.

Comment #22: The proposed action will have no impact on BLM lands.

Response: Thank you for responding.

Comment #21: Any activities associated with tree cutting or controlled burning that will occur near or beneath Western's overhead transmission lines or adjacent to one of its fixed sites should be coordinated.

Response: Thank you for your comment. We will coordinate implementation activities with WAPA.

Comment/Response#20 – No comment was provided with the email and mailing address. Your contact information has been added to our mailing list.

Comment/Response #19 – FS Public Scoping Workshop Notes

Comment #18-1: In general, NEPA documents over 7 years old are considered stale by the courts so we would suggest the Forest Service scale back the project and implement it over a 5 to 7 year period.

Response: The project is expected to be implemented over a 10-year period. An implementation plan (includes an implementation checklist) will be used to assure the decision is implemented as

written. This project validates the models and assumptions used to support the environmental consequences and the forthcoming decision through monitoring and adaptive management. As the decision ages and implementation continues, the Forest Service Chapter 18 review process (Forest Service Handbook 1909.18) would be used to evaluate changed conditions as needed

Comment #18-2: There are numerous contradictions in the proposed action that strongly suggest the use of Best Available Science was not used...Scoping notice states the desired condition is to move towards an uneven-aged forest structure with all size classes represented, yet the Forest Plan requires "Manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape". We read this to say the desired condition is an old growth forest sustained over time across the landscape not an area with all age classes represented.

Response: Desired conditions are based on the forest plan direction which tiers to the Management Requirements for Northern Goshawk (MRNG). The MRNG used maturation rates of southwestern forests to estimate sustainable landscape proportions of old forest. The MRNG recommended that across the forested landscape, about 10% is in the grass/forbs/seedling stage, 10% is in the sapling stage, 20% each is in the young, mid-aged, mature and old stages.

Comment #18-3: The scoping notice speaks to a lack of fire as causing the decline of Aspen and oak yet proposes logging of stimulate these species. Why not burn them after removing small diameter trees?

Response: Thank you for your comment. The aspen stands would be burned after removing conifer encroachment.

Comment #18-4: The desired condition in the majority of the analysis area is FRCC 1 but this would not be conducive to maintaining an old growth forest. Fire is natural and needed to maintain ecological diversity. Ponderosa pine adapted with fire and it should not be excluded.

Response: Existing conditions indicate a departure from desired conditions in that many areas are overly dense and lack uneven-age structure. Treatments are designed to move towards and uneven-age condition with a balance of age class groups (see response #18-2) interspersed with openings. Treatments would retain under-represented age classes and remove over-represented age classes to achieve the desired forest structure.

Comment/Response #17 – Duplicate of Letter #42

Comment #16: First and foremost I would like to thank all the men and women who have put great details into managing our forests in AZ. A healthy forest is the only forest that we all can appreciate.

Response: Thank you for your comment/support.

Comment #15: I am a firm supporter of restoration but also am concerned regarding methods. It would be appreciated if updates in your processes and activities in the Flagstaff Ranger District could be emailed to us- save the trees.

Response: Thank you for your comment/support. We will provide updates via email and the website.

Comment/Response #14: Address change request submitted.

Comment #13: We've determined it is not necessary for the ...Tribe to be part of the project....defer all consultation efforts to the Yavapai Apache Nation.

Response: Thank you for responding.

Comment #12: FYI, thought this might be a useful resource for 4FRI...potential aspen treatments (comment with literature included)

Response: The aspen study was reviewed and we found it to be most applicable to large, continuous stands which are found in the San Francisco Peaks area - which is not part of this analysis. However, the refined proposed action is in alignment with the study's recommendations in terms of planning and designing aspen restoration (decision tree questions) and using local experience and knowledge to design treatments. We look forward to working with you on any refinements.

Comment #11-1: Our primary concern is that a severe wildfire in the Lake Mary Watershed (LMW), in addition to the loss of forest cover and associated values, would result in a spike in sediment transport and deposition into either of the two lakes (thus reducing storage capacity) and the degradation of water quality due to ash and other debris flow....Impact our community in a way not easily addressed after-the-fact...Any additional water production that would result would be a welcome secondary benefit...provide additional supplemental downstream flow into Walnut Canyon.

Response: Thank you for your comment. The LMW is part of refined proposed action and is considered of primary importance.

Comment #11-2: The Greater Flagstaff Area Community Wildfire Protection Plan (GFA-CWPP)...clearly identifies the LMW as a priority area for future forest treatments.

Response: See response #11-1

Comment #11-3: As a founding member of GFFP, we recognize the tremendous benefit of a community-based regional collaborative and we fully intend to continue our support within this framework.

Response: Thank you for your support.

Comment/Response #10 – USFS Public Workshop Notes

Comment #9-1: The following measures are recommended to reduce disturbance of particulate matter, including emissions caused by strong winds as well as machinery and trucks tracking soil off the construction site: 1. Site Preparation and Disturbance; 2. Site Restoration

Response: The Forest Service will comply with air quality standards set by the EPA, as enforced by the Arizona Department of Environmental Quality (ADEQ).

Comment #9-2: The following rules applicable to reducing dust during activities are enclosed: Arizona Administrative Code R18-2-604 through 607, Arizona Administrative Code R18-2-804.

Response: Thank you. See response #9-1.

Comment #9-3: Although no Regional Haze reduction measures are in effect in the proposed project area at this time, measures that reduce disturbance of Particulate Matter also reduce Regional Haze.

Response: Thank you. See response #9-1.

Comment #9-4: Prescribed fire planning should minimize the effects of smoke on public health, public nuisance and visibility in Federal Class 1 Areas....Must also comply with the requirements of Title 18, Chapter 2, Article 15 of the Arizona Administrative Code entitled, "Forest and Range Management Burns" (attached).

Response: The USFS will comply with air quality standards set by the EPA, as enforced by the Arizona Department of Environmental Quality (ADEQ). All burns must conform to the Federal Clean Air Act (individual state programs can be more stringent but not less). Season, weather, topography, resources, and other factors play large roles in determining burn areas, extent, and timing. There are techniques to reduce smoke during burning (e.g., favorable wind conditions, clearing around stumps and removing larger logs to avoid smoldering), and ways to reduce exposure, but it may not be possible to implement these in all cases. This is particularly true as burning increases in volume and extent. In both project planning and implementation, we will do what we can to minimize the effects of smoke on communities, but it is likely there would be increases of smoke over current levels, though we would not exceed the levels allowed by the ADEQ. The Forest Service will continue to coordinate with adjacent landowners/agencies to limit emissions and burn on days when smoke can rise up and disperse, though we realize it often settles into valleys overnight. We are faced with a choice between the effects of increased smoke and the effects of declining forest health and the associated increased community risk that applies to both.

Overtime, smoke management concerns should be reduced, over time, due to the shorter duration and lower volumes of smoke generated with less available forest fuel and less intense fires. Fewer and healthier trees, as a result of thinning, would become more fire resistant and understory vegetation and grasses would become established. With these lowered fuel levels, the acceptable ambient conditions and window for burning is broader too than for initial burns, with warmer, drier, windier situations being advantageous to burn condition and smoke dispersal. The environmental analysis will address potential smoke impacts.

Comment #8-1: On behalf of the 4FRI Landscape Strategy Working Group, attached is the most recent DRAFT report "Management Guidance for Firescape 3". This is near final, but since it has not received final approval from the 4FRI Stakeholder Group, it has the "Important Notice" on the cover and DRAFT watermark throughout. We do not expect it to change much, if at all, so please use it as 4FRI collaborative guidance/input for your planning efforts.

Response: Thank you for your comment. See response #41-3.

Comment #7: Attached is a short section of comments that the Sierra Club submitted to the Kaibab National Forest related to Forest Service management proposals for Ponderosa pine. Would something along these lines fulfill what you need to move 4FRI along or is it too specific.

Response: Re: Manage Old Growth at the individual, group and landscape scale.

A – See response to #53-12

B, C, D, E, G – See desired condition table

F – Proposed action includes areas with minimal or no mechanical treatment. See response to 53-1.

H – Proposed action includes burn only and thin and burn treatments.

J – Proposed action includes road decommission.

K – Existing non-forested openings will be taken into consideration during implementation and moving toward the desired conditions.

L – Proposed action meadow restoration applies only to areas that historically developed under meadow (non-forested conditions) as defined by the Terrestrial Ecosystem Surveys for the Coconino and Kaibab National Forests.

Re: Ponderosa Pine Restoration Management

Desired condition is a balance of age classes.

A, F – Tree groups and non-forested openings between tree groups will be identified during implementation based on existing conditions.

B, C, D, E, H, – See desired condition table

G - Proposed action includes areas with minimal or no mechanical treatment. See response to 53-1.

I - Proposed action includes burn only and thin and burn treatments.

K - Proposed action includes road decommission.

L - Proposed action meadow restoration applies only to areas that historically developed under meadow (non-forested conditions) as defined by the Terrestrial Ecosystem Surveys for the Coconino and Kaibab National Forests.

Comment #7a: I would like to receive documents in hard-copy form.

Response: Thank you. Your preference has been noted in our database.

Comment/Response #6: No comments submitted with email and address. Email and address added to database.

Comment #5: I thought it would be a good to share this paper on the small-diameter wood supply assessment that was recently published. I am amazed to see how this work has evolved into the 4FRI project and others. Congratulations! Consider forwarding a copy to the Chief and Sec. of Ag, to give them an idea of where this started and that you guys are really doing it!....Page 23 gives an example of the data development methods that were used.

Response: Thank you for your comment. See response #47-1.

Comment #4: Is this a project that we as a business can bid on?

Response: Thank you for your interest. A member of our operations team will be in contact with you to provide additional information.

Comment #3: Keep up the good work.

Response: Thank you for your support.

Comment #2: There should be an overriding principle to minimize human contract. That means more wilderness area designation, few if any land trades, off road vehicle restrictions.

Response: Thank you for your comment. However, this is outside the scope of this analysis and we recommend you review the draft forest plan revision documents to see if would meet your expectations.

Comment #1: AIR QUALITY: Of course it is of great importance to make our forests less prone to wildfires. I am a strong advocate for that. However, I live at the base of Oak Creek Canyon in “uptown Sedona” and I can tell you that since these controlled burns have begun, it has dramatically affected my quality of life and my health. At night the smoke anywhere near the canyon drops down into it and hangs there till the next day when it is warm enough for it to lift. I am not exaggerating this point: it truly is miserable here and these controlled burns happen frequently in the area. And now the proposal is for another 10 years of them. To me it sounds like another 10 years of suffering. As far as the forest service is concerned, is there any merit to factoring in the quality of life and health vs. constant controlled burns? Are there other methods for disposing the material, rather than burning it? Are there areas where this material could be transported to and then burned where it would have little if any impact on people?

Response: See comment #9-4.

Appendix B. Landscape Strategy Crosswalk

Table 1. Landscape Strategy (LS) Crosswalk to 4FRI Proposed Action

Topic/Theme	Landscape Strategy (includes TAP)	Reference Location	4FRI Revised Proposed Action	In Alignment? Yes (Y)/No (N)	If Not In Alignment, Why?
Firescape (Purpose)	Identify an area where thinning and burning can be applied to restore fire adapted ponderosa pine	LS, p. 8	Includes additional restoration actions	Y	
LS Temporal Scale	Restoration occurs over time periods of approximately 5 to 20 years	LS, p. 8	Projected implementation timeline is 10 years	Y	Refined PA identifies 10 years as the window for implementation and includes statement that Chapter 18 review would be needed as decision ages to ascertain whether implementation can continue
Firescape Concept/Definition	Name/Definition	LS, p. 8	Proposes name change to restoration unit	N	Concept of firescape has been expanded to reflect focus on pattern, structure, composition and other restoration actions – other components are consistent
Firescape Criteria	Size, orientation, perimeters, descriptions	LS, p. 9	Inclusive	Y	
SPOTS/TOM	Firescape concept	LS, p. 10	Prioritization process	N	How prioritization process addresses

Topic/Theme	Landscape Strategy (includes TAP)	Reference Location	4FRI Revised Proposed Action	In Alignment? Yes (Y)/No (N)	If Not In Alignment, Why?
	lends itself to use of SPOTS and TOM		used		fire need for change without use of SPOTS/TOM will be displayed.
Vegetation Data	Used TES to provide general information on percent cover of understory species	LS, p. 10	Used PNVT to inform understory composition – more exact than TES	N	PNVT provided additional information
	FIA data with FVS used to determine existing condition	LS, p. 11	Used stand data, every stand has 3 sample points – have specific information for 30,000 stands in the analysis area	N	Used the available data to determine existing condition at stand (fine scale) level versus using FIA which is more appropriate for mid and landscape scale assessment.
Treatment Area Identification	5,000 to 50,000 acres in size, based on HUC boundaries	LS, p. 20	Changes name to Restoration Sub-Units, size of Sub-Units	Y	Consistent in all components but name
Exclusion Areas	Excluded 56,914 acres of MSO PACs from treatment	Layer N o. 2, p. 24	Excludes most PACs from mechanical (select PACs would be mechanically treated) and includes prescribed fire for most PACs	N	Coordination with USFWS supports this variation
	Excluded 34,646 acres of sensitive soils	Layer No. 3, p. 24	Included	N	Used to identify fire priorities to avoid uncharacteristic fire effects on soils subject to severe erosion. Acres that have the potential for severe erosion

Topic/Theme	Landscape Strategy (includes TAP)	Reference Location	4FRI Revised Proposed Action	In Alignment? Yes (Y)/No (N)	If Not In Alignment, Why?
					have been evaluated and BMPs developed for any treatment on these soils
	Excluded special management areas (31,483 acres)	Layer No. 4, p. 24	Included Garland Prairie for prescribed fire	See note:	Overall, in alignment
	Excluded steep slopes (27,601 acres)	Layer No. 5, p. 24	Included hand thinning in Dry Lake Hills area	See note:	Overall, in alignment
	Excluded NOGO nest core areas (25,681 acres)	Layer No. 6, p. 24	Included prescribed fire in select goshawk nest stands	N	Results in acreage variation of over 25,000 acres
	Excluded Mountain tops (2,797 acres)	Layer No. 7, p. 24	Excluded as most are mixed conifer	Y	
	Excluded Stream Buffers (450 acres)	Layer No. 8, p. 24	Excluded as no perennials exist	Y	No perennials exist as Firescape 2 is not proposed for treatment
	Excluded Areas of Significant Change (52,965 acres)	Layer No. 9, p. 24	Separated NEPA projects from fire events	N	Took out Eagle Rock, Shultz Fire and need to look at Taylor Fire
			Additional Exclusion – past and current projects	N	FS had most current information on past and current projects
Candidate and Matrix Areas	Description	LS, Table 4, p. 23	Candidate = Primary	Y	Deviation in terms

Topic/Theme	Landscape Strategy (includes TAP)	Reference Location	4FRI Revised Proposed Action	In Alignment? Yes (Y)/No (N)	If Not In Alignment, Why?
			Matrix = Secondary		
Candidate Treatment Area Criteria	Active crown fire 97 th and community protection and Active crown fire with 50 acre filter	LS, Table 4, Layer No. na and 1, pg. 23	Not using 97 th percentile –using real weather conditions (Shultz fire scenario) – vetted with Regional Office	N	Results in large difference in terms of acres – using 97 th percentile equates to more need for treatment
	Municipal and aquatic species watershed and Flagstaff CWPP watersheds	LS, Table 4, Layer No. 2, pg. 23	LMW is not a designated municipal watershed, used watersheds and both Flagstaff and Kaibab (Williams) CWPP	Y	
	Community Protection Areas	LS, Table 4, Layer N o. 3, pg. 23		Y	
	MSO restricted habitat	LS, Table 4, Layer No. 4, pg. 23		N	For classification purposes, created buffers around PACs and PFAs
	Passive crown fire 97 th	LS, Table 4, Layer No. 5, p. 23	Not used, see above	N	Not using 97 th percentile –using real weather conditions (Shultz fire scenario) – vetted with Regional Office
	NEPA completed acres (120,359 ac)	Layer N o. 6, p. 23	Not used unless treatment to meet	N	Results in difference in terms of acres

Topic/Theme	Landscape Strategy (includes TAP)	Reference Location	4FRI Revised Proposed Action	In Alignment? Yes (Y)/No (N)	If Not In Alignment, Why?
			restoration objectives was identified		
	Major road buffers (NFS level 3 to 5), 0.5 mile upwind	Layer No. 7, p. 23	Roads not used as fuelbreaks	N	Used ¼ mile of Mtc. Level 3-4, ¼ mile of Mtc. Level 2 – influenced the priority of silvicultural treatments in terms of operability (access, skidding)
	Mountaintop buffer	Layer No. 8, p. 23	Included as a priority	N	Did not include buffer- design feature of not treating greater than 40% cover this objective and meets the forest plan
	NOGO PFA minus nest cores (26, 107)	Layer No. 9, p. 23	Using prescribed fire	N	Created ½ mile buffer from the PFA to increase priority status
	MSO PAC Buffer – 0.5 mile upwind of restricted habitat	Layer No. 10, p. 23	Buffer is ½ mile SW of PAC to reflect wind direction	See note:	Overall, consistent
	Active crown fire 85 th	Layer No. 11, p. 23	Did not use 85 th or 50 acre filter	N	Not using 85 th percentile –using real weather conditions (Shultz fire scenario) and no 50 acre filter– vetted with Regional Office
	Recreation areas with infrastructure and named campgrounds buffered 1/8 mile	Layer No. 12, p. 23	Not buffered, DC includes recreation infrastructure	N	Reflects change in acres of approximately 19,992 ac.
Spatial Scales	Landscape, Analysis	LS, p. 34			All spatial scales have been refined

Topic/Theme	Landscape Strategy (includes TAP)	Reference Location	4FRI Revised Proposed Action	In Alignment? Yes (Y)/No (N)	If Not In Alignment, Why?
	and Firescape				

Comparison/Consistency Exercise 1:

The IDT reviewed the Garland Prairie Example Treatment Area Description in the Landscape Strategy, pp. 28-30. We found the acres proposed for treatment to be very similar to the acres in the refined proposed action. We found we are using the same filters (with some refinement). Points of variation: (1) FS has 9,000 acres of (non ponderosa pine grassland) burn only treatments proposed, LS did not, (2) LS included acres already covered by NEPA decisions – these have been excluded from the refined proposed action; (3) FS does not have the mountaintop emphasis (exclusion circles around mountaintops), the design feature of not treating slopes greater than 40% covers this objective and meets forest plan requirement.

Table 2. Example 2. Restoration Unit 3-2 Comparison to Landscape Strategy

4FRI PA Treatment Type	Acres	4FRI PA Treatment Type	Acres	Previously Analyzed Treatments	Acres
Aspen Treatment	59	PFA - IT40	186	DOGTOWN	1,350
dPFA - IT40	75	PFA - UEA25	143	ISHAM	1,171
dPFA - UEA40	117	PFA - UEA40	331	HORSE PINE	2,340
GL - Restoration	1,136	Savanna	4,058	MOOSE	1,231
WUI55	14	SI10	17	KA	536
IT25	56	SI25	10	POMERORY	950
IT40	2,495	SI40	375		
MSO Restricted Trt	4,651	UEA10	612		
MSO Target Trt	631	UEA25	538	Previous analysis total acres Total	7,578
MSO Threshold Trt	215	UEA40	6,108	Restoration Unit 3-2	29,405
		(Column) Total Acres	12,378	Landscape Strategy Candidate Areas	32,701
Column total acres	9,449	4FRI Revised PA Total Acres	21,827	Landscape Strategy Candidate Areas is > 4FRI Proposed Acres	3,296

Appendix C - TAP 1 and TAP 3

2011-0301

MANAGEMENT GUIDANCE **RECOMMENDATIONS FOR FIRESCAPE 1**

of the First Analysis Area

REPORT

FROM THE FOUR FOREST RESTORATION INITIATIVE
STAKEHOLDER GROUP TO THE USFS 4FRI PLANNING TEAM

February ??, 2011

IMPORTANT NOTICE: This document is a work in progress from the **Landscape Working Group** of the Four Forest Restoration Initiative (4FRI), and is in DRAFT form until approved by the 4FRI Stakeholder Group. Therefore, this information is subject to change and does not necessarily represent final language, a formal position, or a statement of policy from 4FRI. Comments and suggestions are welcome; please submit any comments to: **Marcus Selig** (mselig@grandcanyontrust.org) or **Sarah Reif** (sreif@azgfd.gov).

FIRESCAPE 1 MANAGEMENT GUIDANCE RECOMMENDATIONS

This document contains general management guidance recommendations for Firescape 1 of the Four Forest Restoration Initiative ("4FRI") area and, when appropriate, more specific guidance recommendations for the treatment areas located within Firescape 1. All management guidance provided in this document is intended to help the Forest Service plan, design, and implement treatments that will achieve the firescape-scale Desired Future Conditions ("DFCs") identified in the Landscape Restoration Strategy for the First Analysis Area Report ("LRS Report"). Therefore, all management guidance in this document is tiered under the firescape-scale DFCs previously identified in the LRS Report.

To facilitate Forest Service planning, the management guidance provided in this document has been grouped into five different categories: (1) mechanical thinning treatments, (2) fire management, (3) wildlife habitat, (4) multiple-use management, (5) watershed management, and (6) invasive species management and other restoration activities.

Although many of the guidance recommendations provided in this document can be used by the Forest Service to design treatments under the Proposed Action for 4FRI's first analysis area, some management guidance will be beyond the scope of the Forest Service's Proposed Action. The 4FRI collaborative hopes that the Forest Service, stakeholders, and other partners will use this guidance to plan, design, and implement additional activities that will help achieve comprehensive restoration within the 4FRI area.

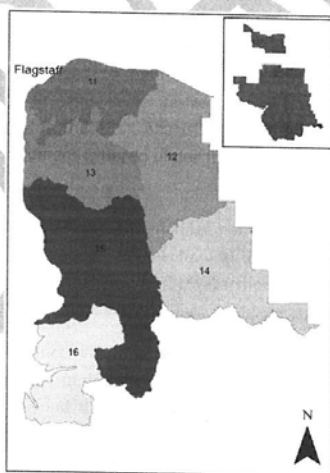





Figure 1. Firescape 1 is located southeast of Flagstaff and consists of six treatment areas.

MECHANICAL THINNING TREATMENT GUIDANCE

FIRESCAPE DFC: Mechanical thinning treatments result in forests that trend toward natural variability, self-regulation, and are better positioned to adapt to climate change without large, rapid, type shifts. 

FIRESCAPE GUIDANCE

- Use site-specific biotic and abiotic factors to design mechanical treatments that result in the full range of variability of forest structural parameters (e.g., basal area, canopy cover, group size, density, etc.). Historically, site-specific prescriptions have generally targeted only the mean or minimum of the range of variability; instead, we desire a full range of prescriptions that create a heterogeneous forest structure across the landscape. 

FIRESCAPE DFC: Mechanical thinning treatments allow natural disturbance processes (e.g., fire, endemic pests and pathogens) to occur at a range of endemic levels. 

FIRESCAPE GUIDANCE

- Mechanical treatment design should consider natural rates of mortality associated with endemic levels of natural disturbances as an additional mechanism for achieving the natural range of variability. Natural disturbance events can and should be used as a means for achieving restoration goals.
- Mechanical treatments should not be designed to eradicate or sanitize the occurrence of natural disturbance processes (e.g., dwarf mistletoe, tornado damage, etc.).
- When designing mechanical thinning treatments in areas containing dwarf mistletoe, treatment activities should be consistent with guidance identified in the “4FRI Large Tree Retention Plan” (“LTRP”) and “Dwarf Mistletoes and their Management in the Southwest” (Conklin and Fairweather 2010).
- Salvage logging projects should be individually assessed, weighing planning and administrative costs, restoration opportunity costs, wildlife habitat values, fire hazard reduction value, and the use of areas as natural fire breaks. Salvage logging is not ecological restoration (Noss et al. 2006).

Summary of Comments on 2011-0606-TAP1.pdf

Page: 3

-
- Number: 1 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:41:23 PM
Trending towards HRV included in P/N and PA, movement towards self-regulation is not - assume that mechanical treatment will be needed in the long-term - well beyond this project - key is trending towards and project-wide

 - Number: 2 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:41:44 PM
Consistent

 - Number: 3 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:42:27 PM
see comment on TAP 3

FIRESCAPE DFC: Following mechanical thinning treatments, there is low potential for unnaturally severe fire¹ to spread across the Firescape.

FIRESCAPE GUIDANCE

- We would like to go through an iterative modeling process and fire simulations with the Forest Service and Forest ERA to determine what portion of a firescape must be treated to prevent the spread of unnaturally severe fire.
 - **EXAMPLE RESULT OF MODELING PROCESS** -- Treat x% of areas exhibiting the potential for active crown fire under 97th percentile conditions, as described in the LRS Report, with strategically placed mechanical thinning to preclude crown fires larger than [##-##] contiguous acres.

FIRESCAPE DFC: Strategically placed mechanical thinning treatments allow fire managers to safely manage prescribed fires and naturally ignited fires in a way that benefits and enhances the resilience of forest ecosystems.

TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Walnut Canyon Treatment Area(11)-Specific Guidance**
 - Mechanical thinning treatments should be prioritized in remaining areas of predicted active and passive crown fire (ForestERA FlamMap 97th percentile conditions) in the ponderosa pine forests of the western portion of the treatment area to protect known NOGO nest-cores, WUI locations, and major infrastructure
 - Mechanical thinning treatments should be focused strategically in areas of predicted active and passive crown fire (ForestERA FlamMap 97th percentile conditions) in the ponderosa pine forests of SE portion of the treatment area to protect Walnut Canyon, known MSO PACs, NOGO PFAs, and additional cultural resources.
 - Mechanical treatments that occur north of Lake Mary Rd and moving east towards Walnut Canyon will need to be more aggressive given the difficulty with using managed fire in this area.
- ❖ **Lake Mary Treatment Area (13)**
 - Because of the extreme importance of this treatment area to municipal water supply (Lake Mary system), treatments should focus on eliminating the risk of active crown fire.
- ❖ **Mormon Lake Treatment Area (15)**
 - ❖ Mechanical thinning treatments should be prioritized in remaining areas of predicted active and passive crown fire (ForestERA FlamMap 97th percentile conditions) in the ponderosa pine forests of the treatment area to protect known MSO PACs, NOGO nest-cores, WUI locations, dispersed private lands, old growth structure, and major infrastructure.


¹ Examples of "unnaturally severe" fires include the Hochderffer-Horseshoe Fire (1996), Pumpkin Fire (2000), Rodeo-Chedeski Fire (2002), Warm Fire (2006), and Shultz Fire (2010).

Number: 1	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:43:34 PM
Prioritization process used - effects analysis would display how treatments may affect unplanned ignitions in the future			
Number: 2	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:44:28 PM
WUI and infrastructure covered			
Number: 3	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:45:11 PM
Marshall project covered most of this area with this analysis picking up the remainder			
Number: 4	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:45:59 PM
Marshall analysis covered this			
Number: 5	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:46:02 PM
Consistent - covered in PA			
Number: 6	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:46:16 PM
Consistent - covered in PA			

- ❖ In the central and southern portion of this treatment area, mechanical thinning treatments should emphasize retention of larger tree groups that are oriented with their long axis perpendicular to the prevailing winds in order to maintain and enhance habitat for wildlife that depend on denser forests. For example, tassel-eared squirrels require a minimum tree group size of 5 acres in their winter core areas. Squirrel winter core areas can serve as proxy habitat for other wildlife that require large tree groups such as mule deer (day beds), turkey (roosts), songbirds (foraging and nesting), and raptors (nesting). Treatments can and should occur within tree groups. Forest openings can be designed adjacent to larger tree groups to disrupt fuel continuity, and other values at risk should be considered when designing placement of large tree groups.

DRAFT

Number: 1 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:48:27 PM
Treatments may or may not equal 5 acre minimums. Higher density would occur in higher quality sites - Vegetation can provide size of groups (1/4 to 1/2 acres in size and 1 acre if VSS 4-5 occurs)

FIRESCAPE DFC: Strategically placed mechanical thinning treatments maintain and enhance, but do not degrade habitat for listed, rare, and sensitive species. 

FIRESCAPE GUIDANCE


- For general wildlife habitat recommendations, we recommend consideration of the AGFD-USFWS-ERI draft publication “Desired Forest Conditions for Wildlife in Arizona’s Ponderosa Pine Forests.”
- For each treatment area, we provide occurrence and locality information for special status plants and animals (see Appendix). The following management recommendations should be used to guide restoration activities in treatment areas to provide for a variety of special status species.
 - Retain snags during mechanical treatments.
 - Retain large trees and snags near water sources (e.g., tanks, drinkers, wetlands, lakes), consistent with the LTRP.
 - Follow Forest Plan direction for implementing the Northern Goshawk Management Recommendations.
 - Implement the Recovery Plan for the Mexican spotted owl.
 - Emphasize retention of large trees and snags on north-facing slopes near highways, lakes, and wetlands for bald eagles.
 - Avoid creating landings on or skid trails across forest openings and meadows.
 - Retain coarse and fine woody debris where possible.
- For rare and sensitive plants:
 - Conduct surveys for rare and sensitive plant species.
 - In areas where rare and sensitive plant species are known to occur, avoid disturbance and trampling.
- Reduce road density by obliterating roads identified in the Travel Management Rule (“TMR”).

TREATMENT AREA-SPECIFIC GUIDANCE

❖ **Walnut Canyon Treatment Area (11)-Specific Guidance**



- There is a particularly high occurrence rate of special status species in the vicinity of Walnut Canyon. Habitat needs and species’ response to disturbance should be considered when designing treatments in this vicinity.
- Retain vegetative cover along the rims of Walnut Canyon to facilitate wildlife movement.
- Flagstaff Pennyroyal is dispersed across the western portion of this project area. Areas of known occurrence should be considered when conducting mechanical treatments.


Lake Mary Treatment Area (13)-Specific Guidance

- This treatment area has a high density of MSO PACs that are contiguous with areas of predicted crown fire. Treatments should be strategically located to protect these MSO PACs and implemented in a way that does not risk loss of existing PACs. 

❖ **Mormon Lake Treatment Area (15) SG**

Number: 1 Author: pcote See comments in TAP 3	Subject: Sticky Note	Date: 6/6/2011 3:48:55 PM
Number: 2 Author: pcote Covered to high degree in Marshall project	Subject: Sticky Note	Date: 6/6/2011 3:49:25 PM
Number: 3 Author: pcote Consistent - covered in PA	Subject: Sticky Note	Date: 6/6/2011 3:49:44 PM
Number: 4 Author: pcote Covered in PA	Subject: Sticky Note	Date: 6/6/2011 3:50:10 PM




- This treatment area has a high density of MSO PACs that are contiguous with areas of predicted crown fire. Treatments should be strategically located to protect these MSO PACs and implemented in a way that does not risk loss of existing PACs. 
- This treatment area contains a lot of pine-oak habitat that is particularly important for MSO, bats, and songbirds. Mechanical treatments should pay particular attention to the pine-oak guidelines in the MSO Recovery Plan, including treatments that promote growth of additional large oaks. 

FIRESCAPE DFC: Invasive non-native species are rare or absent and do not create novel ecological communities following implementation of mechanical thinning treatments. 

FIRESCAPE GUIDANCE

- Implement the Three Forest Weed EIS.
- Where possible avoid implementing mechanical thinning treatments in areas where current conditions are identified as “at risk” of invasion or expansion of exotic species. Implementation of mechanical thinning treatments in these areas should not occur until invasive species management creates a favorable environment for treatment implementation.
- Expand and test the predictive models for cheatgrass from the North Kaibab Ranger District to encompass the 4FRI area.
- When implementing mechanical treatments that buffer Wilderness and canyons, sequence treatments to reduce the likelihood of spread of invasive species into Wilderness and canyons (i.e., treat areas adjacent to unaffected areas where exotic species occurrence is low first to reduce chances of spread through treatments).

TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Walnut Canyon Treatment Area (11)-Specific Guidance** 
 - ❖ Many of the larger populations of Mediterranean Sage, thistles, and knapweeds that occur in this firescape are located in this treatment area. Additional prevention and control precautions should be coincident with mechanical treatments as well as species specific BMPs.
- **Lake Mary Treatment Area (13)**
 - ❖ The occurrence of a number of grassy washes and parks in this treatment area are susceptible to invasion by non-native species following mechanical treatment and fire. Additional prevention and control precautions should be coincident with mechanical treatments as well as species specific BMPs. 
- **Mormon Lake Treatment (15)**
- There are scattered infestations of leafy spurge near Broliar Park southwest toward Stoneman Lake. Additional prevention and control precautions should be coincident with mechanical treatments as well as species specific BMPs. 

Number: 1 Covered in PA	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:55:19 PM
Number: 2 Consistent - in pA	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:55:14 PM
Number: 3 See TAP 3 response	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:55:23 PM
Number: 4 See previous note	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:55:56 PM
Number: 5 Covered in PA	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:56:22 PM
Number: 6 Populations are known and addressed	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:56:41 PM

Number: 1 Author: pcote Discussion point	Subject: Sticky Note	Date: 6/6/2011 3:57:00 PM
Number: 2 Author: pcote N/A	Subject: Sticky Note	Date: 6/6/2011 3:57:19 PM
Number: 3 Author: pcote Covered	Subject: Sticky Note	Date: 6/6/2011 3:57:35 PM


FIRE MANAGEMENT GUIDANCE

FIRESCAPE DFC: Where possible, natural fire regimes regulate forest structure and composition and align forest changes with climate change.




FIRESCAPE GUIDANCE

- Use site-specific biotic and abiotic factors to design burning activities that result in the full range of variability of forest structural parameters (e.g., basal area, canopy cover, group size, density, etc.).
- Coordinate with counties to implement Firewise guidance in county, regional, and small community plans.

TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Walnut Canyon Treatment Area (11)-Specific Guidance** 
 - Treatment design and location should reflect the difficulty with applying fire to this particular landscape given difficulties with access and topography and the lack of control/suppression features.
 - The high proportion of state and private lands in this treatment area requires an all lands approach that relies on coordination and implementation of additional programs for private landowners.

Lake Mary Treatment Area (13)-Specific Guidance

- ❖ Much of this treatment area can be managed using natural fire following mechanical treatment with the exception of Mormon mountain, Mountaineer, and additional private lands. 
- ❖ Fire should be used prudently in the eastern portion of the treatment area to protect watershed values. 
- ❖ **Mormon Lake Treatment Area (15)**
 - Consider comprehensive mechanical treatment prior to widespread application of managed fire in order to protect old-growth component, as well as individual trees with consideration of MSO PACs. 

FIRESCAPE DFC: Natural and prescribed fires maintain and enhance, but do not degrade habitat for listed, rare, and sensitive species. 

FIRESCAPE GUIDANCE

- For each treatment area, we provide occurrence and locality information for special status plants and animals. The following management recommendations should be used to guide restoration activities in treatment areas. See Appendix for special status species locality information by Treatment Area.

Number: 1	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:58:27 PM
See previous comments			
Number: 2	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:58:56 PM
Prescribed fire is part of the PA			
Number: 3	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:59:15 PM
Would be addressed in design and BMP			
Number: 4	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:59:40 PM
Covered in PA			
Number: 5	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:59:59 PM
See TAP 3			

- Prep snags >24" dbh (Rabe et al. 1998) prior to fire treatments by raking duff away from the base (Fowler et al. 2010).
- Avoid smoke inundation of known raptor breeding areas during the breeding seasons
- Follow Forest Plan direction for implementing the Northern Goshawk Management Recommendations.
- Implement the Recovery Plan for the Mexican spotted owl.
- Identify sensitive or rare plants within the burn area and consider individual species' response to fire prior to treating area.
- Manage the seasonality of planned fires in large meadow systems to promote a diversity of warm- and cool-season grasses.

FIRESCAPE DFC: Natural and prescribed fires support diverse native plant communities and their associated biodiversity.

FIRESCAPE GUIDANCE

- Understory vegetation must be managed to allow for the accumulation of fuels that can sufficiently restore a frequent fire regime.
- Livestock grazing and ungulates should be managed to allow for the generation of a sufficient accumulation of understory fuels.
- Burn treatments in pine-oak should employ additional safeguards to prevent loss of large oaks and oak snags.

FIRESCAPE DFC: Exotic non-native species are rare or absent and do not create novel ecological communities following natural and prescribed fires.

FIRESCAPE GUIDANCE

- Explore expanding and testing the predictive models for cheatgrass from the North Kaibab Ranger District to encompass the 4FRI area.
- Where possible avoid implementing burning treatments in areas where current conditions are identified as "at risk" of invasion or expansion of exotic species, including cheatgrass. Implementation of burning treatments in these areas should not occur until invasive species management creates a favorable environment for treatment implementation.

TREATMENT AREA-SPECIFIC GUIDANCE

- **Walnut Canyon Treatment Area (11) –**
 - ❖ Large populations of Flagstaff Pennyroyal are located in the areas south and west of Walnut Canyon. This species is particularly sensitive to fire and being outcompeted by cheatgrass and Dalmation toadflax.
- ❖ **Lake Mary Treatment Area-Specific Guidance**

Number: 1 Author: pcote Subject: Sticky Note Date: 6/6/2011 4:02:58 PM
See TAP 3 Comments

Number: 2 Author: pcote Subject: Sticky Note Date: 6/6/2011 4:03:13 PM
See previous comment

- Populations of Flagstaff Pennyroyal are located throughout this treatment area on limestone soils. This species is particularly sensitive to fire and being outcompeted by cheatgrass and Dalmation toadflax.

FIRESCAPE DFC: Old-growth forest structure is protected during prescribed burns and naturally ignited fires. 


TREATMENT AREA-SPECIFIC GUIDANCE

○ **Walnut Canyon Treatment Area (11)**

- ❖ OG forest structure locations: Walnut Canyon, Faye Canyon, Sandy's Canyon
- ❖ OG individual trees: Skunk Canyon

Lake Mary Treatment Area (13)-Specific Guidance

- ❖ OG Forest Structure: Upper Kelly Canyon, Upper James Canyon, SW of Lower Lake Mary
- ❖ **Mormon Lake TA**
 - OG forest structure: Bar M watershed; Beaver Creek watershed; Rattlesnake Canyon; Mormon Mtn

FIRESCAPE DFC: Fire managers manage planned and unplanned fires in locations, seasons and conditions that maximize smoke dispersion and minimize smoke impacts. 

FIRESCAPE GUIDANCE

- This Firescape's proximity to the Mogollon Rim and the likelihood of smoke concentration necessitates additional outreach to residents of the Verde Valley.
- Additional attention should be paid to implementing Emission Reduction Techniques for prescribed burns conducted in this Firescape.

Number: 1 Author: pcote Subject: Sticky Note Date: 6/6/2011 4:00:26 PM
See previous comment

Number: 2 Author: pcote Subject: Sticky Note Date: 6/6/2011 4:02:40 PM
See TAP 3 comments

WILDLIFE HABITAT GUIDANCE

FIRESCAPE DFC: Habitat management is contributing to the recovery of listed, rare, and sensitive species.

TREATMENT AREA-SPECIFIC GUIDANCE

❖ Lake Mary


- The southern portion of this treatment area should emphasize retention of larger tree groups that are oriented with their long axis perpendicular to the prevailing winds in order to maintain and enhance habitat for wildlife that depend on denser forests (see discussion above).

❖ Mormon Lake Treatment Area

- In the central and southern portion of this treatment area, mechanical thinning treatments should emphasize retention of larger tree groups that are oriented with their long axis perpendicular to the prevailing winds in order to maintain and enhance habitat for wildlife that depend on denser forests (see discussion above)
- Potential restoration of northern leopard frogs across the treatment area:
 - Assess crayfish distribution; continue to explore eradication methods
 - Fence several waters (to be identified in collaboration with AGFD and USFWS) for livestock exclusion, protection from recreational damage, and clean them out


Number: 1	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 4:04:45 PM
Review PA, any further recommendations?			
Number: 2	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 4:04:59 PM
Review PA, any additional comments?			
Number: 3	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 4:04:37 PM
Future restoration action			

MULTIPLE-USE MANAGEMENT GUIDANCE

FIRESCAPE DFC: Livestock grazing is compatible with and does not compromise native plant and wildlife biodiversity. 

FIRESCAPE GUIDANCE

- Livestock grazing is managed to minimize its inhibition of native understory composition, productivity, and biodiversity.
- Livestock grazing is managed to reestablish the competition-fire filter (herbaceous vegetation outcompetes pine regeneration and is sufficient to carry fire that reduces regeneration when it occurs).
- Livestock grazing is managed to allow for the accumulation of fuels that are sufficient to carry fire.
- Allotment management plans should be consistent with forest restoration objectives as expressed in the LRS Report (and consistent with Forest Plans).
- Management recommendations identified in the Apache-Sitgreaves Burned Area Restocking Guidelines are implemented across the 4FRI Project Area.

FIRESCAPE DFC: Off-road vehicle use is compatible with and does not compromise native biodiversity. 

FIRESCAPE GUIDANCE

- The TMR is implemented and enforced.
- Mechanical thinning treatment task orders should include road obliteration activities identified in the TMR.
- The off-road vehicle policy is enforced to ensure that Gambel oak stands that are visible post-thinning are protected from unauthorized fuelwood harvest.

TREATMENT AREA-SPECIFIC GUIDANCE

- **Walnut Canyon Treatment Area (11)**
 - Reduce OHV impacts to grassy washes in the SW portion of the treatment area
- ❖ **Lake Mary Treatment Area (13)**
 - Reduce OHV impacts to parks and other grassy areas throughout the treatment area, including Howard Draw, Priest Draw, and Elk Park Drainage.
- ❖ **Mormon Lake TA**
 - Efforts to reduce OHV impacts should focus on the northern half of the TA as well as tanks throughout the TA to protect Northern Leopard Frog habitat.

Number: 1 Author: pcote Subject: Sticky Note Date: 6/6/2011 4:05:15 PM
See TAP 3

Number: 2 Author: pcote Subject: Sticky Note Date: 6/6/2011 4:05:27 PM
See TAP 3

FIRESCAPE DFC: Recreational use is compatible with and does not compromise native biodiversity.



FIRESCAPE GUIDANCE


- Rehabilitation efforts are focused on restoring degraded areas and protecting existing biodiversity in areas receiving heavy recreational use.
- Work cooperatively with recreation interest groups and coordinate rehabilitation efforts to take place in concert with nearby mechanical thinning and fire treatments.
- Do not create new roads or access to Wilderness areas when conducting treatment activities.

TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Walnut Canyon Treatment Area (11)**
 - Strategic location of treatments should account for areas of high recreational value such as the Arizona Trail, the Pit, Canyonview? campground, and historical sites.
- ❖ **Lake Mary Treatment Area (13)**
 - Strategic location of treatments should account for areas of high recreational value such as the climbing areas in Priest Draw and water-based recreation associated with Lake Mary
- ❖ **Mormon Lake Treatment Area (15)**
 - Recreational use impacts should be managed or mitigated in northern half of TA with particular emphasis on dispersed camping impacts in parks and meadows.

DRAFT

WATERSHED MANAGEMENT GUIDANCE

FIRESCAPE DFC: Stable, restored forested ecosystems foster watersheds that yield enhanced water quantity and quality and are resilient to climatic variability. 

FIRESCAPE GUIDANCE

- This Firescape contains a portion of the headwaters of the Verde and Little Colorado River.
- Regional groundwater recharge and streamflow are greatly affected by hydrologic processes in the Ponderosa pine forest. Natural and human systems rely on these water resources.
- Prioritize grassland and meadow restoration in this Firescape.
- Integrate mechanical thinning and prescribed burning treatments with other comprehensive restoration activities.
- Prioritize road obliteration on roads that contribute to watershed degradation.
- Engineer road system placement and drainage to reduce erosion potential.
- Consider maximizing snow accumulation potential, in conjunction with other values, when designing mechanical thinning prescriptions. Utilize forest openings shaded by clumps and groups of trees to promote snow accumulation and retention.
- In conjunction with management for other resource values, plan for use of prescribed fire at appropriate intervals to reduce evapotranspiration and enhance groundwater recharge and surface water discharge.




TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ Lake Mary Treatment Area (13)-Specific Guidance
 - Hocksworth, Clark, and Babbit Springs should be protected and restored consistent with the Large Tree Retention Plan
 - Due to the presence of the treatment area's municipal watershed and other hydrologic concerns, initial and follow-up treatments should implement prescriptions that account for the need for increased water yield.
- ❖ Mormon Lake Treatment Area - Specific Guidance
 - There are several springs within this TA; these should be evaluated to determine the best candidates for restoration.

INVASIVE SPECIES MANAGEMENT AND OTHER RESTORATION ACTIVITIES GUIDANCE

FIRESCAPE DFC: Exotic species are rare or absent and do not create novel ecological communities following disturbance.

FIRESCAPE GUIDANCE

- Implement the Three Forest Weed EIS. 
- Coordinate invasive species treatments to occur concurrently with mechanical thinning and fire treatments. 
- Work cooperatively with Weed Management Areas and volunteer groups to provide follow-up surveys and treatment following mechanical thinning and fire. 

TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Mormon Lake Treatment Area-Specific Guidance**
 - Crayfish, leafy spurge

DRAFT

-
- Number: 1 Author: pcote Subject: Sticky Note Date: 6/6/2011 4:06:33 PM
Consistent

 - Number: 2 Author: pcote Subject: Sticky Note Date: 6/6/2011 4:06:58 PM
BMPs and design features have been developed by team botanist

 - Number: 3 Author: pcote Subject: Sticky Note Date: 6/6/2011 4:07:13 PM
Implementation Plan

MANAGEMENT GUIDANCE
RECOMMENDATIONS FOR FIRESCAPE 3

of the First Analysis Area

REPORT

FROM THE FOUR FOREST RESTORATION INITIATIVE
STAKEHOLDER GROUP TO THE USFS 4FRI PLANNING TEAM

January 31, 2011

*IMPORTANT NOTICE: This document is a work in progress from the **Landscape Strategy Working Group** of the Four Forest Restoration Initiative (4FRI), and is in DRAFT form until approved by the 4FRI Stakeholder Group. Therefore, this information is subject to change and does not necessarily represent final language, a formal position, or a statement of policy from 4FRI. Comments and suggestions are welcome; please submit any comments to: **Marcus Selig** (mselectig@grandcanyontrust.org) or **Sarah Reif** (sreif@azgfd.gov).*

FIRESCAPE 3 MANAGEMENT GUIDANCE RECOMMENDATIONS

This document contains general management guidance recommendations for Firescape 3 of the Four Forest Restoration Initiative ("4FRI") area and, when appropriate, more specific guidance recommendations for the treatment areas located within Firescape 3. All management guidance provided in this document is intended to help the Forest Service plan, design, and implement treatments that will achieve the firescape-scale Desired Future Conditions ("DFCs") identified in the Landscape Restoration Strategy for the First Analysis Area Report ("LRS Report"). Therefore, all management guidance in this document is tiered under the firescape-scale DFCs previously identified in the LRS Report.

To facilitate Forest Service planning, the management guidance provided in this document has been grouped into ~~five~~six different categories: (1) mechanical thinning treatments, (2) fire management, (3) wildlife habitat, (4) multiple-use management, (5) watershed management, and (6) invasive species management and other restoration activities.

Although many of the guidance recommendations provided in this document can be used by the Forest Service to design treatments under the Proposed Action for 4FRI's first analysis area, some management guidance will be beyond the scope of the Forest Service's Proposed Action. The 4FRI collaborative hopes that the Forest Service, stakeholders, and other partners will use this guidance to plan, design, and implement additional activities that will help achieve comprehensive restoration within the 4FRI area.

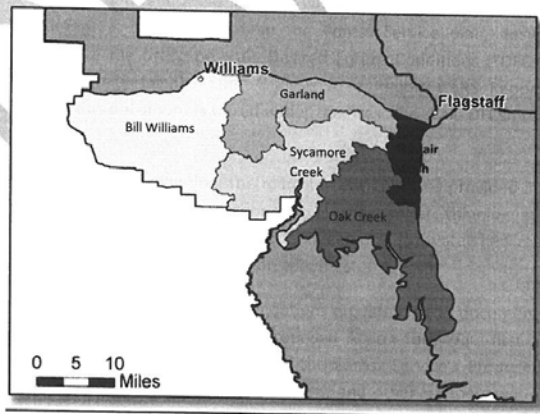


Figure 1. Firescape 3 is located southwest of Flagstaff and consists of five treatment areas: Bill Williams, Garland, Sycamore Creek, Oak Creek, and Sinclair Wash Treatment Areas.

MECHANICAL THINNING TREATMENT GUIDANCE

FIRESCAPE DFC: Mechanical thinning treatments result in forests that trend toward natural variability, self-regulation, and are better positioned to adapt to climate change without large, rapid, type shifts.

FIRESCAPE GUIDANCE

- Use site-specific biotic and abiotic factors to design mechanical treatments that result in the full range of variability of forest structural parameters (e.g., basal area, canopy cover, group size, density, etc.). Historically, site-specific prescriptions have generally targeted only the mean or minimum of the range of variability; instead, we desire a full range of prescriptions that create a heterogeneous forest structure across the landscape.

FIRESCAPE DFC: Mechanical thinning treatments allow natural disturbance processes (e.g., fire, endemic pests and pathogens) to occur at a range of endemic levels.

FIRESCAPE GUIDANCE

- Mechanical treatment design should consider natural rates of mortality associated with endemic levels of natural disturbances as an additional mechanism for achieving the natural range of variability. Endemic levels of natural disturbance events can and should be used as a means for achieving restoration goals.
- Mechanical treatments should not be designed to eradicate or sanitize the occurrence of endemic levels of natural disturbance processes (e.g., dwarf mistletoe, tornado damage, etc.).
- When designing mechanical thinning treatments in areas containing dwarf mistletoe, treatment activities should be consistent with guidance identified in the "4FRI Large Tree Retention Plan" ("LTRP") and "Dwarf Mistletoes and their Management in the Southwest" (Conklin and Fairweather 2010).
- Salvage logging projects should be individually assessed, weighing planning and administrative costs, restoration opportunity costs, wildlife habitat values, fire hazard reduction value, and the use of areas as natural fire breaks. Salvage logging is not ecological restoration (Noss et al. 2006).


TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Garland Treatment Area-Specific Guidance**
 - In tornado damaged areas, salvage logging projects should be individually assessed within a landscape context, weighing planning and administrative costs, restoration opportunity costs, wildlife habitat values, fire hazard reduction value, and the use of areas as natural fire breaks.


Summary of Comments on 2011-0606-TAP3-Crosswalk.pdf

Page: 4


-
- Number: 1 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:24:49 PM
Trending towards HRV included in P/N and PA, movement towards self-regulation is not - assume that mechanical treatment will be needed in the long-term - well beyond this project - key is trending towards and project-wide
-
- Number: 2 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:17:21 PM
Consistent
-
- Number: 3 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:17:50 PM
In alignment with forest plan, project objectives
-
- Number: 4 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:27:44 PM
(1) Consideration of mortality - addressed in effects analysis - FFE of FVS modeling
(2) Using natural disturbance events as a means to achieve restoration goals - not quantifiable
-
- Number: 5 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:29:00 PM
Overall consistent with PA- some sanitizing would occur, no eradication would occur
-
- Number: 6 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:20:49 PM
PA is Consistent with Conklin and Fairweather
-
- Number: 7 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:29:50 PM
Not a salvage project - some tornado damaged acres are part of this analysis and some are part of a separate project - Turkey/Barney.
-
- Number: 8 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:30:25 PM
This project is not addressing salvage - tornado damaged areas is integrated with other thinning and burning activities.


- The prioritization of treatment of tornado damaged areas should be integrated with other thinning and burning activities. 

❖ **Sycamore Creek Treatment Area-Specific Guidance**



- In tornado damaged areas, salvage logging projects should be individually assessed within a landscape context, weighing planning and administrative costs, restoration opportunity costs, wildlife habitat values, fire hazard reduction value, and the use of areas as natural fire breaks. 
- The prioritization of treatment of tornado damaged areas should be integrated with other thinning and burning activities.

❖ **Oak Creek Treatment Area-Specific Guidance**

- In tornado damaged areas, salvage logging projects should be individually assessed within a landscape context, weighing planning and administrative costs, restoration opportunity costs, wildlife habitat values, fire hazard reduction value, and the use of areas as natural fire breaks. 
- The prioritization of treatment of tornado damaged areas should be integrated with other thinning and burning activities.

FIRESCAPE DFC: Following mechanical thinning treatments, there is low potential for unnaturally severe fire¹ to spread across the Firescape. 

FIRESCAPE GUIDANCE

- We-The Stakeholder Group would like to go through an iterative modeling process and fire simulations with the Forest Service and Forest ERA to help the Forest Service determine what portion of a firescape must be treated to prevent the spread of unnaturally severe fire.
- **EXAMPLE RESULT OF MODELING PROCESS** -- Treat x% of areas exhibiting the potential for active crown fire under 97th percentile conditions, as described in the LRS Report, with strategically placed mechanical thinning to preclude crown fires larger than [##-##] contiguous acres. 
- Treatment design should build on the objectives of the Community Wildfire Protection Plans for Flagstaff and Williams. 

¹ Examples of "unnaturally severe" fires may include fires of extreme size or intensity, such as the Hochderffer-Horseshoe Fire (1996), Pumpkin Fire (2000), Rodeo-Chedeski Fire (2002), Warm Fire (2006), Woody Fire (2006), Hardy Fire (2010), and Shultz Fire (2010).

- Number: 1 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:23:02 PM
Consistent - has been included in the PA


- Number: 2 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:31:24 PM
Decision already made in this area

- Number: 3 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:31:41 PM
Decision already made

- Number: 4 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:33:11 PM
Effects analysis will address fire potential at various scales including treatment area (restoration sub-unit), firescape (restoration unit) and analysis area (988,932 ac)


- Number: 5 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:34:44 PM
Fire modeling did not use 97th percentile - used Schultz Fire weather parameters, in addition potential for high intensity surface fire was factored into PA

- Number: 6 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:34:16 PM
PA is consistent with the CWPPs





FIRESCAPE DFC: Strategically placed mechanical thinning treatments allow fire managers to safely manage prescribed fires and naturally ignited fires in a way that benefits and enhances the resilience of forest ecosystems. 

TREATMENT AREA-SPECIFIC GUIDANCE



❖ **Bill Williams Treatment Area-Specific Guidance**

- In addition to implementing treatments in the NEPA-completed areas within the Treatment Area, mechanical thinning treatments should be implemented in the Sycamore Canyon priority area identified in the Kaibab Forest Health Focus and the LRS Report. 



❖ **Garland Treatment Area-Specific Guidance**

- Some portion of all candidate areas within the Treatment Area should receive treatment (thinning, burning, or both); however, there are three goshawk nest cores that overlap with candidate treatment areas. These will require additional evaluation to determine appropriate treatment. 
- In the southwestern portion of the Treatment Area, mechanical thinning treatments should focus on protecting the headwaters of Sycamore Canyon from unnaturally severe fire (and allow for safe management of fire around Sycamore Canyon). 
- Coordinate with Camp Navajo to focus on protecting the headwaters of Volunteer Canyon from unnaturally severe fire. 
- In the southwestern portion of the Treatment Area, mechanical thinning treatments should retain larger tree groups that are oriented with their long axis perpendicular to the prevailing winds in order to maintain and enhance existing wildlife corridors and meet fire management objectives (i.e., management of fire at larger than current scales). 

❖ **Sycamore Creek Treatment Area-Specific Guidance**

- Mechanical thinning treatments should be concentrated in areas with predicted active crown fire under 97th percentile conditions, as described in the LRS Report. 
- Mechanical thinning treatment intensity should vary based on topography. Higher intensity treatments (i.e., treatments resulting in lower density, crown cover, and basal area) should be implemented in flatter areas (e.g., meadows and swales), with lower intensity treatments occurring on steeper slopes of isolated hills and knobs. 

❖ **Oak Creek Treatment Area-Specific Guidance**

- Mechanical thinning treatments should be prioritized in areas adjacent to canyon rims and Wilderness, even if not identified as “candidate areas,” to facilitate the use of natural fire in unthinnable areas (e.g., steep slopes and Wilderness) while protecting wildlife habitat and other resources outside canyons from the spread of fire out of the canyon. 
- Areas with predicted crown fire under 97th percentile conditions, as described in the LRS Report, should be treated with mechanical thinning; Note, however, that areas of predicted active crown fire south of Woods Canyon ~~are~~ may not be regarded as priority areas for treatment, as we ~~several Stakeholders~~ believe there is a possibility that the model is being exaggerated by the presence of piñon-juniper forest type. 

- Number: 1 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:48:17 PM
Prioritization process used - effects analysis would display how treatments may affect unplanned ignitions in the future

- Number: 2 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:48:35 PM

- Number: 3 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:50:27 PM
Covered - nest stands included for prescribed fire

- Number: 4 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:50:49 PM
Addressed in foreseeable project - Turkey-Barney

- Number: 5 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:51:09 PM
Cumulative Effects

- Number: 6 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:52:07 PM
wildlife corridors have been designed with Arizona Game and Fish

- Number: 7 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:52:49 PM
Consistent - however, we are not using 97th percentile - using Schultz weather parameters

- Number: 8 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:00:13 PM
soils (TES) and site class used - treatments are based on site characteristics - topography was one criteria considered

- Number: 9 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:59:08 PM
See previous response - north side of West Fork is proposed for treatment

- Number: 10 Author: pcote Subject: Sticky Note Date: 6/6/2011 2:59:30 PM
Woods Canyon excluded from this analysis





- Other candidate areas in this Treatment Area may or may not require mechanical thinning treatments.

❖ **Sinclair Wash Treatment Area-Specific Guidance** 


- Due to previously implemented treatments and already planned projects, this Treatment Area ~~does~~ may not contain high priority areas for additional mechanical thinning. The need for additional mechanical treatments in this Treatment Area will be dependent upon an assessment of the intensity and completion of ongoing projects in the Treatment Area.

FIRESCAPE DFC: Strategically placed mechanical thinning treatments maintain and enhance, but do not degrade habitat for listed, rare, and sensitive species.

FIRESCAPE GUIDANCE





- For general wildlife habitat recommendations, we recommend consideration of the AGFD-USFWS-ERI draft publication “Desired Forest Conditions for Wildlife in Arizona’s Ponderosa Pine Forests.” 
- For each treatment area, we provide occurrence and locality information for special status plants and animals (see Appendix). The following management recommendations should be used to guide restoration activities in treatment areas to provide for a variety of special status species.
 - Retain snags during mechanical treatments.
 - Retain large trees and snags near water sources (e.g., tanks, drinkers, wetlands, lakes), consistent with the LTRP.
 - Follow Forest Plan direction for implementing the Northern Goshawk Management Recommendations.
 - Implement the Recovery Plan for the Mexican spotted owl.
 - Emphasize retention of large trees and snags on north-facing slopes near highways, lakes, and wetlands for bald eagles. 
 - Avoid creating landings on or skid trails across forest openings and meadows.
 - Retain coarse and fine woody debris where possible.
- For rare and sensitive plants:
 - Conduct surveys for rare and sensitive plant species.
 - In areas where rare and sensitive plant species are known to occur, avoid disturbance and trampling. 
- Reduce road density by obliterating roads identified in the Travel Management Rule (“TMR”). 

TREATMENT AREA-SPECIFIC GUIDANCE

❖ **Bill Williams Treatment Area-Specific Guidance** 





- Treatments in pine-oak forest types should be implemented in a manner consistent with the Recovery Plan for the Mexican spotted owl.

Number: 1	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:04:15 PM
We believe this is referencing Woody project which has a decision and is not being re-analyzed			
Number: 2	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:08:30 PM
Reviewed, consistent			
Number: 3	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:08:54 PM
meeting forest plan			
Number: 4	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:09:30 PM
mitigation that would be provided by botanist			
Number: 5	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:09:53 PM
Analysis is not addressing open road density			
Number: 6	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:10:19 PM
N/A - Bill Williams is a project			

- See Appendix for Heritage Data Management System special status species localities.
- ❖ **Garland Treatment Area-Specific Guidance**
 - See Appendix for Heritage Data Management System special status species localities.
 - There are at least two fairly new and mostly undescribed species (*Potentilla arizonica* and another possible hybrid or subspecies that hasn't been named) that are endemic to the Garland Prairie and Centennial Forest area. Because they are basically undescribed, they are not currently protected by any laws; however, monitoring should still be established for these species. 
- ❖ **Sycamore Creek Treatment Area-Specific Guidance**
 - Treatments in pine-oak forest types should be implemented in a manner consistent with the Recovery Plan for the Mexican spotted owl. 
 - See Appendix for Heritage Data Management System special status species localities.
- ❖ **Oak Creek Treatment Area-Specific Guidance**
 - See Appendix for Heritage Data Management System special status species localities. 
- ❖ **Sinclair Wash Treatment Area-Specific Guidance**
 - See Appendix for Heritage Data Management System special status species localities. 

FIRESCAPE DFC: Invasive non-native species are rare or absent and do not create novel ecological communities following implementation of mechanical thinning treatments.

FIRESCAPE GUIDANCE

- Implement the Three Forest Weed EIS. 
- Where possible, avoid implementing mechanical thinning treatments in areas where current conditions are identified as “at risk” of invasion or expansion of exotic species. When possible, implementation of mechanical thinning treatments should be postponed for “at risk” areas until actions have been taken to reduce the risk of invasion or expansion of exotic species, creating in these areas should not occur until invasive species management creates a more favorable environment for treatment implementation. 
- Expand and test the predictive models for cheatgrass from the North Kaibab Ranger District to encompass the 4FRI area. 
- When implementing mechanical treatments that buffer Wilderness and canyons, sequence treatments to reduce the likelihood of spread of invasive species into Wilderness and canyons (i.e., treat areas adjacent to unaffected areas where exotic species occurrence is low first to reduce chances of spread through treatments). 

Number: 1	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:10:50 PM
Forwarded to team Botanist			
Number: 2	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:11:05 PM
Consistent			
Number: 3	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:11:39 PM
see previous response			
Number: 4	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:11:23 PM
See previous response			
Number: 5	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:12:03 PM
Consistent - implementing the FEIS/ROD			
Number: 6	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:12:38 PM
BMPs will be used to address site specific conditions			
Number: 7	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:13:17 PM
Expanded modeling is not part of this analysis			
Number: 8	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:13:51 PM
In compliance - survey->treat->BMPs applied->monitor			

FIRESCAPE DFC: Old-growth forest structure² is protected³ from damage when implementing mechanical thinning treatments.


FIRESCAPE GUIDANCE




- In accordance with the LTRP, do not remove old-growth trees for any reason.
- Manage identified target/threshold habitats (based on Recovery Plan for the Mexican spotted owl) to allow for future recruitment of old-growth forest structure.

TREATMENT AREA-SPECIFIC GUIDANCE

❖ **Oak Creek Treatment Area-Specific Guidance**

- Create buffer to protect old-growth forest structure and research plots on private land near Barney Springs. 

❖ **Sinclair Wash Treatment Area-Specific Guidance**

- Old-growth forest structure near Pumphouse Wash, Kelly Canyon, Fry Canyon and James Canyon should be protected.
- Old-growth trees near Dry Lakes, Woody Mountain, and Woody Ridge should be protected for recruitment of old growth forest structure. 

² Old-growth forest structure is defined as trees, snags, and coarse woody debris originating from trees present before settlement, circa 1880.



³ Old-growth forest structure protection may be accomplished by strategically placing mechanical thinning treatments adjacent to old-growth forest structure to help manage or control the spread of fire into old-growth forest structure, or by (1) carefully locating skid trails to avoid old-growth trees, (2) raking fuels from around the base of old-growth forest structure, (3) using wet-lining or applying foam retardant to retard burning, or (4) burning in the spring before the base of snags and large coarse woody debris has dried out sufficiently to burn. These protection measures should be tested during the adaptive management process. The Stakeholders acknowledge that old-growth forest structure protection measures often require intensive resources; therefore, the use of the most costly implementation measures (i.e., raking and wet-lining or foam retardants) should primarily be used in targeted, high-priority areas.

Number: 1	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:16:44 PM
Separate discussion to be held			
Number: 2	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:17:03 PM
Part of the Turkey-Barney project			
Number: 3	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:17:16 PM
Agree			


FIRE MANAGEMENT GUIDANCE

FIRESCAPE DFC: Where possible, natural fire regimes regulate forest structure and composition and align forest changes with climate change.

FIRESCAPE GUIDANCE

- Use site-specific biotic and abiotic factors to design burning activities that result in the full range of variability of forest structural parameters (e.g., basal area, canopy cover, group size, density, etc.). 
- Coordinate with ~~counties~~ local governments to implement Firewise guidance in county, regional, and small community plans. 

TREATMENT AREA-SPECIFIC GUIDANCE







- ❖ **Bill Williams Treatment Area-Specific Guidance**
 - After completion of mechanical thinning treatments, this Treatment Area, with the exception of the northeast corner, could be managed using fire at larger than current scales.
- ❖ **Garland Treatment Area-Specific Guidance**
 - In the eastern portion of the Treatment Area, private lands and other constraints require that fire be managed at current scales.
 - In the western portion of the Treatment Area, treatments should be implemented to facilitate management of fire at larger than current scales.
 - Cooperation with Camp Navajo, Camp Raymond, State Forestry, and local fire districts is essential to increasing the scale at which fire can be managed.
 - The Forest Service and Stakeholders should coordinate with local fire districts (i.e., Ponderosa Fire) to help educate and involve private landowners in efforts to increase the scale at which fire can be managed. 
- ❖ **Sycamore Creek Treatment Area-Specific Guidance**
 - Following mechanical thinning of areas with predicted active crown fire under 97th percentile conditions, as described in the LRS Report, the area west of Sycamore Canyon could be managed with fire at larger than current scales.
 - The occurrence of State lands, including Centennial Forest, and private lands east of Sycamore Canyon will require a high degree of cooperation to increase the scale at which planned and unplanned fire can be managed within this treatment area.
- ❖ **Oak Creek Treatment Area-Specific Guidance**
 - In the northern portion of the treatment area, the use of fire at larger than current scales may be restricted by smoke impacts on the 365 kV 230-2 transmission line transecting the treatment area.
 - The high occurrence of State lands, including Centennial Forest, will require a high degree of cooperation to increase the scale at which fire can be managed. This is the priority area for the Arizona State Land Department to focus their fuel reduction and forest management efforts in accordance with the Statewide Strategy for Restoring Arizona's Forests.
- ❖ **Sinclair Wash Treatment Area-Specific Guidance**

Number: 1	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:18:04 PM
Consistent			
Number: 2	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:18:54 PM
Not part of the NEPA analysis - tactical			
Number: 3	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:19:46 PM
Refer to previous comments			
Number: 4	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:18:40 PM
not part of the NEPA analysis - tactical			

- Managed fire at current scales should be used to enhance the forest structure established by previously implemented mechanical thinning and burning treatments.


FIRESCAPE DFC: Natural and prescribed fires maintain and enhance, but do not degrade habitat for listed, rare, and sensitive species.

FIRESCAPE GUIDANCE



- For each treatment area, we provide occurrence and locality information for special status plants and animals. The following management recommendations should be used to guide restoration activities in treatment areas. See Appendix for special status species locality information by Treatment Area.
 - Prep snags >24" dbh (Rabe et al. 1998) prior to fire treatments by raking duff away from the base (Fowler et al. 2010). 
 - Avoid smoke inundation of known raptor breeding areas during the breeding seasons 
 - Follow Forest Plan direction for implementing the Northern Goshawk Management Recommendations. 
 - Implement the Recovery Plan for the Mexican spotted owl. 
 - Identify sensitive or rare plants within the burn area and consider individual species' response to fire prior to treating area. 
 - Manage the seasonality of planned fires in large meadow systems to promote a diversity of warm- and cool-season grasses. 

FIRESCAPE DFC: Natural and prescribed fires support diverse native plant communities and their associated biodiversity.

FIRESCAPE GUIDANCE

- Understory vegetation must be managed to allow for the accumulation of fuels that can sufficiently restore a frequent fire regime.
- Livestock grazing and ungulates should be managed to allow for the generation of a sufficient accumulation of understory fuels. 

TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Bill Williams Treatment Area-Specific Guidance**
 - Where fire spread across adjacent lands is appropriately buffered, fire should be used to recruit and restore aspen stands.
- ❖ **Garland Treatment Area-Specific Guidance**
 - Efforts should be initially concentrated at Garland prairie, McDougal flat, and other grasslands and meadows (e.g., the area southeast of Spring Canyon). 
 - Additional treatment efforts should focus on treatment of areas with predicted surface fire larger than 500 acres. 
- ❖ **Sycamore Creek Treatment Area-Specific Guidance**

-
- Number: 1 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:20:47 PM
raking will not be part of mitigation

 - Number: 2 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:21:04 PM
will be consistent with forest plan

 - Number: 3 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:21:21 PM
forest plan requirement

 - Number: 4 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:21:31 PM
forest plan requirement




 - Number: 5 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:21:55 PM
consistent


 - Number: 6 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:22:35 PM
implementation will work with grazing management - seasonality only applicable for maintenance burrs

 - Number: 7 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:22:57 PM
see response to comments

 - Number: 8 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:24:32 PM
McDougal Flat is in Bill Williams analysis - reference to area southeast of Spring Canyon is unknown

 - Number: 9 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:24:55 PM
Recommendation unclear

- There is a high occurrence of areas with diverse understory communities in this Treatment Area. Efforts should be made to survey and identify specific areas containing rare and sensitive species.
- Treatments should be initially concentrated at Roger's Lake, Volunteer Canyon, and Sycamore Canyon to promote and protect rare and sensitive species in these areas. 
- ❖ **Oak Creek Treatment Area-Specific Guidance**
 - Efforts should be initially concentrated at Clay Park, Fry Park, Mill Park, and other grasslands and areas with uncommon understory species (e.g., blue spruce and big-tooth maple cohorts in Fry Canyon). 
- ❖ **Sinclair Wash Treatment Area-Specific Guidance**
 - Efforts should be concentrated at Dry Lakes, Pumphouse Wash, Sinclair Wash, Kelly Canyon, Fry Canyon, James Canyon, Woody Spring, Garden Spring, Griffith Spring, Kelly Seep, Mortgage Spring, Wilson Seep, and Scott Spring. 

FIRESCAPE DFC: Exotic non-native species are rare or absent and do not create novel ecological communities following natural and prescribed fires. 

FIRESCAPE GUIDANCE

- Explore expanding and testing the predictive models for cheatgrass from the North Kaibab Ranger District to encompass the 4FRI area.
- Where possible avoid implementing burning treatments in areas where current conditions are identified as "at risk" of invasion or expansion of exotic species, including cheatgrass. Implementation of burning treatments in these areas should not occur until invasive species management creates a favorable environment for treatment implementation.

TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Garland Treatment Area-Specific Guidance**
 - The cheatgrass infestation of the greater Woody Mountain area is of particular concern and should be considered when planning and managing fire in this area.
- ❖ **Sycamore Creek Treatment Area-Specific Guidance**
 - When conducting burning activities adjacent to Roger's Lake, Wilderness, and canyons, sequence treatments to prevent the spread of invasive species.
 - The cheatgrass infestation of the greater Woody Mountain area should be considered when planning and managing fire in this area.
- ❖ **Oak Creek Treatment Area-Specific Guidance**
 - When conducting burning activities that buffer Wilderness and canyons, sequence treatments to prevent the spread of spotted knapweed into Wilderness and canyons.
 - The cheatgrass infestation of the greater Woody Mountain area should be considered when planning and managing fire in this area.
- ❖ **Sinclair Wash Treatment Area-Specific Guidance**

Number: 1	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:26:45 PM
Roger's Lake - mostly on state lands, Volunteer Canyon - too steep and MSO PAC			
Number: 2	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:27:09 PM
Covered in Turkey-Barney project			
Number: 3	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:27:20 PM
see previous comment			
Number: 4	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:27:33 PM
See earlier responses			

- The cheatgrass infestation of the greater Woody Mountain area should be considered when planning and managing fire in this area.

FIRESCAPE DFC: Old-growth forest structure is protected during prescribed burns and naturally ignited fires.

TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Oak Creek Treatment Area-Specific Guidance**
 - Create buffer to protect old-growth forest structure and research plots on private land near Barney Springs.
- ❖ **Sinclair Wash Treatment Area-Specific Guidance**
 - Old-growth forest structure near Pumphouse Wash, Kelly Canyon, Fry Canyon and James Canyon should be protected.
 - Old-growth trees near Dry Lakes, Woody Mountain, and Woody Ridge should be protected for recruitment of old growth forest structure.

FIRESCAPE DFC: Fire managers manage planned and unplanned fires in locations, seasons and conditions that maximize smoke dispersion and minimize smoke impacts.



FIRESCAPE GUIDANCE

- This Firescape's proximity to the Mogollon Rim and the likelihood of smoke concentration necessitates additional outreach to residents of the Verde Valley.
- Additional attention should be paid to implementing Emission Reduction Techniques for prescribed burns conducted in this Firescape.

WILDLIFE HABITAT GUIDANCE


FIRESCAPE DFC: Habitat management is contributing to the recovery of listed, rare, and sensitive species.

TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Bill Williams Treatment Area-Specific Guidance**
 - Potential restoration of northern leopard frogs at Coleman Lake and vicinity (e.g., Metate Tank)
 - Assess bullfrog distribution within 5 mile radius; eradicate if possible
 - Maintain enclosure fence, deepen perennial pools
- ❖ **Garland Treatment Area-Specific Guidance**
 - Build roost platforms for double-crested cormorants and osprey at Scholz Lake (in addition to retention of large trees and snags)
- ❖ **Sycamore Creek Treatment Area-Specific Guidance**
 - Potential restoration of northern leopard frogs west of Sycamore Canyon
 - Assess bullfrog distribution; eradicate if possible
 - Fence several waters (to be identified in collaboration with AGFD and USFWS) for livestock exclusion and clean them out
 - Prioritize northern leopard frog reintroduction in the Deadman Pocket area
 - Construct osprey platforms (in addition to retention of large trees and snags) at White Horse Lake and JD Dam Lake
 - Increase the open water to wetland vegetation ratio at Rankin Tank to enhance habitat for marsh birds
- ❖ **Sinclair Wash Treatment Area-Specific Guidance**
 - Explore potential for northern leopard frog reintroduction at Griffiths Spring and tank
 - Reduce impacts of dispersed recreation along the western boundary of Rogers Lake


Number: 1 Author: pcote Would not be in this analysis	Subject: Sticky Note	Date: 6/6/2011 3:28:38 PM
Number: 2 Author: pcote future projects	Subject: Sticky Note	Date: 6/6/2011 3:28:48 PM

MULTIPLE-USE MANAGEMENT GUIDANCE


FIRESCAPE DFC: Livestock grazing is compatible with and does not compromise native plant and wildlife biodiversity. 

FIRESCAPE GUIDANCE

- Livestock grazing is managed to minimize its inhibition of native understory composition, productivity, and biodiversity.
- Livestock grazing is managed to reestablish the competition-fire filter (herbaceous vegetation outcompetes pine regeneration and is sufficient to carry fire that reduces regeneration when it occurs).
- Livestock grazing is managed to allow for the accumulation of fuels that are sufficient to carry fire.
- Allotment management plans should be consistent with forest restoration objectives as expressed in the LRS Report (and consistent with Forest Plans).
- Management recommendations identified in the Apache-Sitgreaves Burned Area Restocking Guidelines are implemented across the 4FRI Project Area.

FIRESCAPE DFC: Off-road vehicle use is compatible with and does not compromise native biodiversity. 

FIRESCAPE GUIDANCE

- The TMR is implemented and enforced.
- Mechanical thinning treatment task orders should include road obliteration activities identified in the TMR. 
- The off-road vehicle policy is enforced to ensure that Gambel oak stands that are visible post-thinning are protected from unauthorized fuelwood harvest.


TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Garland Treatment Area-Specific Guidance**
 - Continue managing vehicular access to lakes and tanks.
- ❖ **Oak Creek Treatment Area-Specific Guidance**
 - Prioritize implementation of the TMR to restrict cross country travel in the Treatment Area's numerous parks and riparian areas.
- ❖ **Sinclair Wash Treatment Area-Specific Guidance**
 - This is a high priority area for implementing and enforcing the TMR.

-
- Number: 1 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:29:14 PM
Most outside scope - not making grazing decisions

 - Number: 2 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:30:08 PM
most comments outside scope of this analysis

 - Number: 3 Author: pcote Subject: Sticky Note Date: 6/6/2011 3:30:38 PM
road obliteration is within this analysis - whether it is part of a contract is unknown

FIRESCAPE DFC: Recreational use is compatible with and does not compromise native biodiversity. 

FIRESCAPE GUIDANCE

- Rehabilitation efforts are focused on restoring degraded areas and protecting existing biodiversity in areas receiving heavy recreational use.
- Work cooperatively with recreation interest groups and coordinate rehabilitation efforts to take place in concert with nearby mechanical thinning and fire treatments.
- Do not create new roads or access to Wilderness areas when conducting treatment activities.








TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ **Garland Treatment Area-Specific Guidance**
 - Reduce social trails into Paradise Forks climbing area.
 - Use byproducts of small diameter thinning to provide firewood to campers at White Horse Lake and other high-use camping areas to discourage fuel-wood harvest.
- **Sycamore Creek Treatment Area-Specific Guidance**
 - Use byproducts of small diameter thinning to provide firewood to campers at JD Draw and White Horse Lake and other high-use camping areas to discourage fuel-wood harvest.
 - Work with Coconino County to develop an interpretive trail at Rogers Lake that also connects to Fort Tuthill.

WATERSHED MANAGEMENT GUIDANCE

FIRESCAPE DFC: Stable, restored forested ecosystems foster watersheds that yield enhanced water quantity and quality and are resilient to climatic variability.

FIRESCAPE GUIDANCE

- This Firescape contains a portion of the headwaters of the Verde River and Little Colorado River. ¹
- Regional groundwater recharge and streamflow are greatly affected by hydrologic processes in the Ponderosa pine forest. Natural and human systems rely on these water resources. ²
- Prioritize grassland and meadow restoration in this Firescape. ³
- Integrate mechanical thinning and prescribed burning treatments with other comprehensive restoration activities. ⁴
- Prioritize road obliteration on roads that contribute to watershed degradation. ⁵
- Engineer road system placement and drainage to reduce erosion potential.
- Consider maximizing snow accumulation potential, in conjunction with other values, when designing mechanical thinning prescriptions. Utilize forest openings shaded by clumps and groups of trees to promote snow accumulation and retention. ⁶
- In conjunction with management for other resource values, plan for use of prescribed fire at appropriate intervals to reduce evapotranspiration and enhance groundwater recharge and surface water discharge. ⁷

TREATMENT AREA-SPECIFIC GUIDANCE

- ❖ Garland Treatment Area-Specific Guidance
 - As part of the Sycamore Canyon watershed, treatments that benefit water quality, groundwater recharge and water yield are desirable for this treatment area.
- ❖ Sycamore Creek Treatment Area-Specific Guidance
 - As part of the Sycamore Canyon watershed, treatments that benefit water quality, groundwater recharge and water yield are desirable for this treatment area.
 - Install a streamflow gauge in Sycamore Creek to monitor flow. Partnerships may be developed with the U.S. Geological Survey, Salt River Project and/or the Yavapai County Flood Control District to fund installation and operation of the gauge.

Number: 1	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:31:45 PM
general info			
Number: 2	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:31:57 PM
general			
Number: 3	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:32:13 PM
consistent			
Number: 4	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:32:26 PM
consistent			
Number: 5	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:32:34 PM
consistent			
Number: 6	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:37:54 PM
Site characteristics would drive design			
Number: 7	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:37:23 PM
Clarification needed			
Number: 8	Author: pcote	Subject: Sticky Note	Date: 6/6/2011 3:33:23 PM
consistent			

Number: 1 Author: pcote see previous comments	Subject: Sticky Note	Date: 6/6/2011 3:34:08 PM
Number: 2 Author: pcote future restoration objectives	Subject: Sticky Note	Date: 6/6/2011 3:34:18 PM

Appendix D – Landscape Strategy Desired Conditions

Table 3. Stakeholder Landscape Strategy Desired Conditions and 4Fri Refined Purpose and Need Alignment Crosswalk

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
Landscape Scale			
a. Conservation of biological diversity	Ponderosa pine ecosystems provide the necessary composition, structure, abundance, distribution, and processes that contribute to the diversity of native plant and animal species across the 2.4 million acre 4FRI landscape.		For clarification, the scale of analysis is the ponderosa pine type on the Coconino and Kaibab National Forest. Since the Landscape Strategy is specific to the Coconino and Kaibab, the desired condition should be at the same scale. The purpose and need for the project reflects composition, structure, pattern (distribution). Abundance is not part of the purpose and need.
	Viable, ecologically functional populations of native species that include common, listed rare and sensitive species persist in natural patterns of distribution and abundance		This is too broad for the project level- even at this project’s landscape scale. All projects are designed are to move towards forest plan desired conditions since project desired conditions are derived from the forest plan. How all projects/activities contribute to “functional” populations and distribution and abundance is evaluated at the forest plan scale and displayed in an annual monitoring report. For example, the revised draft plan for the Coconino includes the following Mission statement, “sustaining the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations and the forest’s Vision includes such statements as, “ The Coconino NF contains healthy ecosystems with an abundant and diverse flora and fauna.” The desired conditions for the forest’s wildlife, fish and botanical resources states, Ecological conditions provide habitat for

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
			<p>federally-listed and other special status species. Habitat conditions contribute to the survival and recovery of listed species, contribute to the de-listing of species under the Endangered Species Act, preclude the need for listing new species, and improve conditions for Forest Service Southwestern Region Sensitive Species....Follow existing recovery plans for federally listed species....Genetic diversity exists within native plant and animal populations, thus assisting species to adapt to changing environmental conditions. This desired condition is similar to what NFMA includes as the definition of diversity: The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan (NFMA, page 5 of 54)...and again in NFMA...fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area (NFMA, p. 39 of 54).</p>
	<p>Natural disturbance processes (e.g., fire, drought-mortality, endemic levels of forest pests and pathogens) are the primary agents shaping forest ecosystem structure, dynamics, habitats, and diversity over time.</p>	<p>i.</p>	<p>The statement as written is somewhat contradictory to the Coconino’s (draft plan) landscape scale desired conditions for ponderosa pine as both natural and anthropogenic disturbances are included. The desired conditions for the landscape scale states, “The composition, structure, and function of vegetative conditions are resilient to the frequency, extent, and severity of disturbances and climate variability. The landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (e.g. insects, dwarf-mistletoe or pathogens, diseases, drought, fire, and wind), including snags, downed logs, and old trees. Grasses, forbs, shrubs, leaves, and needle cast (fine fuels), and small trees maintain the natural fire regime. Organic ground cover and native herbaceous vegetation provide protection from accelerated soil erosion; promote water infiltration, and nutrient cycling function in order to contribute to</p>

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
			<p>plant and animal diversity and to ecosystem function. Frequent, low severity fires (Fire Regime I) are characteristic in this type. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling. The objective of this project is to re-establish forest structure, pattern and composition, which will lead to increased forest resiliency and function. Resiliency increases the ability of the ponderosa pine forest to survive natural disturbances such as insect and disease, fire and climate change.</p>
	<p>Where fire use is not possible, mechanical treatments are designed to restore and/ or maintain forest structure over time.</p>	<p>iv.</p>	<p>This is not a desired condition. It is the “how to” or an objective. The desired condition is to move towards an uneven-aged forest structure with all size classes represented. The desired condition is to have the majority of the analysis area in FRCC I. There is a need to reduce the potential for crown fire and high intensity surface fire. In order to maintain grassy openings and interspaces between trees (as well as promote Gambel oak and aspen), there is a need to move towards having frequent fires that burn with low to mixed severity in 0 to 35 year intervals across most of the analysis area. Vegetation diversity throughout the analysis area has declined. There is a need to maintain and promote Gambel oak by removing ponderosa pine competition, stimulating new growth and maintaining growth in large diameter trees. Where possible, there is a need to regenerate aspen by removing ponderosa pine competition, stimulating growth and increasing individual recruitment. Grasslands (which includes wet and dry meadows), which were once found throughout the analysis area, have shifted to woody vegetation as a result of tree encroachment (USDA Forest Service 2008) (USDA Forest Service 2009). The desired condition is to restore the historic patterns of trees within grasslands. There is a need to reduce/remove tree encroachment from historic</p>

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
			grasslands. To maintain Gambel oak, aspen and grasslands, there is a need to reduce canopy density by thinning ponderosa pine encroachment.
b. Ecosystem resilience	Ponderosa pine ecosystems in the 4FRI are capable of adapting to or persisting with climate change without rapid, large scale type shifts	i.	Consistent
	There is reduced potential for introduction, establishment, and spread of invasive species and the reduction of existing infestations.	ii.	This is not a desired condition in terms of quantifying the existing condition, the desired condition and the gap between the two (the need for change). It is a forest plan requirement and a design feature that would be common to all action alternatives.
	Low intensity frequent fire operates as the primary natural process maintaining forest structure and function	iii.	The desired condition is to have the majority of the analysis area in FRCC I. There is a need to reduce the potential for crown fire and high intensity surface fire. In order to maintain grassy openings and interspaces between trees (as well as promote Gambel oak and aspen), there is a need to move towards having frequent fires that burn with low to mixed severity in 0 to 35 year intervals across most of the analysis area. The Coconino draft working plan desired conditions for ponderosa pine does not include the word “primary”. The desired condition includes the following statements: “The landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (e.g. insects, dwarf-mistletoe or pathogens, diseases, drought, fire, and wind), including snags, downed logs, and old trees. Grasses, forbs, shrubs, leaves, and

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
			needle cast (fine fuels), and small trees maintain the natural fire regime. Frequent, low severity fires (Fire Regime I) are characteristic in this type. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling. (Coconino draft working plan, p.52).
	Mixed severity fire is sometimes used as a restoration tool in appropriate ecological and social settings (e.g., non-WUI areas) to restore and maintain natural forest types.	iv.	This is a design feature that would be made part of the proposed action and a component of the effects analysis.
	Forest insects and pathogens occur and operate at endemic levels.	v.	Consistent. See earlier response.
	Ponderosa pine ecosystems in the 4FRI are capable of regeneration and recovery following natural disturbance (e.g., fire, outbreaks of insects and pathogens).	vi.	Consistent. See earlier response.
c. Conservation and maintenance of soil, water and air resources	Soil productivity, watershed function, and air quality are not at risk of being degraded by uncharacteristically severe disturbances (e.g., landscape level high-severity fire).	i.	Consistent. Included in the project objective, purpose and need and would also be addressed in effects analysis (comparison between no action and the proposed action).

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	Sensitive soils are protected through use of appropriate timber harvesting equipment and techniques to reduce erosion and sedimentation that could otherwise damage aquatic life, increase flooding, reduce reservoir capacity, and increase costs of maintaining infrastructure in the vicinity of waterways.	ii.	This is a forest plan requirement (protection of sensitive soils) and a design feature that is part of the proposed action.
	Forest structure supports a variety of natural resource values and processes, including hydrologic function, which meets ecological and human needs.	iii.	Consistent – desired condition is to move towards forest structure desired conditions, effects analysis would display how this affects other resources and processes.
	Fire is used as a management tool to support hydrologic function while minimizing impacts to soils and other natural resource values.	iii.	The use of fire as a management tool is consistent and design features which address minimizing impacts (through timing, etc.) via the burn plan.
	Rare and ecologically valuable springs and wet meadows are protected and enhanced through appropriate restoration treatments where	iii.	Consistent.

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	needed.		
d. Economics	The byproducts of mechanical forest restoration offset the costs of treatment implementation.	i.	This is a goal but not a desired condition in terms of quantifying a need for change (between existing and desired conditions) and is not appropriate for a NEPA purpose and need.
	The economic value of ecosystem services provided by restored forests (such as the value of recreation or water) are captured and re-invested to support forest restoration and ecosystem management.	ii	This is a goal but not a desired condition in terms of quantifying a need for change (between existing and desired conditions) and is not appropriate for a NEPA purpose and need.
	Rural communities receive direct and indirect economic benefits and ecosystem services as a result of forest restoration and resilient forests.	iii	This is a goal but not a desired condition in terms of quantifying a need for change (between existing and desired conditions) and is not appropriate for a NEPA purpose and need. How rural communities are affected will be displayed in the effects analysis.
e. Social systems	There is broad public awareness, understanding/knowledge and support for collaboratively based forest restoration decisions, processes, and outcomes, including the use	i	This is a goal but not a desired condition in terms of quantifying a need for change (between existing and desired conditions) and is not appropriate for a NEPA purpose and need.

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	of fire as a management tool		
	Social values and recreational opportunities are protected and/or enhanced through forest restoration activities.	ii	Consistent with project purpose and need. How values and opportunities are affected will be displayed in the effects analysis.
	Rural communities are protected from high-severity fire and their quality of life is enhanced through forest restoration.	iii	Consistent with project purpose and need
	Rural communities play an active part in reducing fire risk by implementing FIREWISE actions and creating defensible space around their property.	iii	This is outside the scope of this project. However, how firewise actions on private lands could affect fire behavior (when combined with this project) would be part of the cumulative effects analysis.
	There is broad public support for the 4FRI collaborative as forest restoration activities are implemented.	iii	This is a goal but not a desired condition that would be part of the purpose and need.

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
Mid-Scale: Analysis Area Desired Conditions			
a. Conservation of biological diversity	Ponderosa pine ecosystems provide the necessary composition, structure, abundance, distribution, and disturbance processes that contribute to the diversity of native plant and animal species across the analysis area.	I	The purpose and need for the project reflects composition, structure, pattern (distribution) of the ponderosa pine ecosystem. Abundance is not part of the purpose and need.
	Viable, ecologically functional populations of native species that include common, listed rare and sensitive species persist in natural patterns of distribution and abundance. sustainable habitat, effects to species displayed.	ii	This statement is a forest plan scale of analysis. The purpose and need for this project is to contribute to forest plan desired conditions – sustainable habitat. Effects analysis will display effects to sensitive and listed species. What is considered rare and what is considering declining (with exception of MIS) is subjective and broad.
	Natural disturbance processes (e.g., fire, drought-mortality) are the primary agents shaping forest structure dynamics, habitats, and species diversity over time.	iii	This is not consistent with 4FRI desired condition. At this scale, natural disturbance processes are primary agents, but are not exclusive. Ponderosa pine ecosystems are composed of all age and size classes within the analysis area and are distributed in patterns more consistent with reference conditions. Ponderosa pine ecosystems are heterogeneous in structure and distribution at the analysis area. Openings and densities vary within the analysis area to maintain a mosaic appropriate to support resilience of individual trees and groups of trees.

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	Ponderosa pine vegetation supporting listed, rare, and declining species and surrounding vegetation is strategically managed to be resilient to uncharacteristic disturbances.	vi.	See previous response (ii). The purpose of this project is to affect forest structure and forest health for the purposes of moving towards resiliency. Required analysis will address how project affects sensitive and listed species. What is considered rare and what is considering declining (with exception of MIS) is subjective and broad.
	All pre-settlement trees are not targeted or retained.	vii.	Retention of pre-settlement trees has been addressed as an objective and through design features.
	Understory vegetation composition and abundance are consistent with the natural range of variability.	viii.	Consistent with emphasis placed on moving towards HRV.
b. Ecosystem resilience	A majority of the ponderosa pine ecosystems supports frequent, low-intensity fire.	i.	Consistent
	Mixed severity fire is sometimes used as a restoration tool in appropriate ecological and social settings (e.g., non-WUI areas) to restore and maintain natural	ii	This is not a desired condition. Mixed fire severity would be a result of fire as a result of fuel conditions – displayed in effects analysis.

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	forest types		
	Ponderosa pine ecosystems are Moving Toward restored to more natural tree densities in order to maintain availability of moisture and nutrients to support adaptation to climate change without rapid, large scale type shifts.	iii	Consistent
	There is reduced potential for introduction, establishment, and spread of invasive species and the reduction of existing infestations.	iv.	Design feature of the proposed action (built in mitigation). Adaptive management would allow for adjusting actions if invasive species are introduced, established, or increase (spread).
	Ponderosa pine treatments are designed to protect soil and increase understory biodiversity and productivity to improve their resilience to invasive species.	v.	Design feature of the proposed action (built in mitigation)
	Natural disturbance processes (e.g., fire, endemic pests, and pathogens) are within the	vi.	Consistent

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	natural range of variability.		
c. Conservation and maintenance of soil, water and air resources	Ponderosa pine vegetation treatments are implemented so as to minimize negative impacts to water quality, soil productivity, and air quality.	i.	Consistent w/ project design features and mitigation designed to meet forest plan requirements. For example, short-term impacts are minimized through the implementation of best management practices and strategies.
	Restored ponderosa pine ecosystems accommodate natural and other fires without uncharacteristic impacts to soil productivity and or watershed resources.	ii	Consistent
	Ponderosa pine vegetation within the analysis area is managed strategically and at a level appropriate to prevent degradation of air quality beyond regulatory standards (through wildland fire or managed fire).	iii	Consistent
	Forest openings are designed to improve snow accumulation and subsequent soil moisture and surface water yield.	iv	Consistent/Effects Analysis

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	Hydrologic processes are re-established to restore springs and wet meadow ecosystems.	v	Consistent
d. Economics	The average net cost of treatment per acre for all treatments in the analysis area over a ten year period is reduced significantly. Econ Anal	i.	Addressed as possible in economic analysis (assumptions used to evaluate alternatives), however, the overall net cost/acre is not a desired condition in terms of NEPA. Is more appropriate at the strategy level.
	Sufficient harvest and manufacturing capacity exists to achieve restoration of at least 300,000 acres in the next ten years.	ii.	See response above. Not a desired condition in terms of resource driven need for change. Is more appropriate at the strategy level.
	Rural communities in the analysis area experience economic benefits and improved ecosystem services associated with a restored forest and reduced high-severity fire risk. Consistent	iii	Addressed as possible in economic analysis (assumptions used to evaluate alternatives).
e. Social systems	A majority of the general public is aware, knowledgeable and	i.	Implementation, Communication Strategy

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	supportive of 4FRI related plans and implemented treatments within the analysis area.		
	The general public is aware of 4FRI educational and outreach programs and has the opportunity to participate in the 4FRI effort.	ii.	Implementation, Communication Strategy
	Treatments within the analysis area minimize short-term impacts and enhance vegetation characteristics valued by Forest users over the long-term.	iii.	Proposed Action Design Feature/Effects Analysis
	4FRI restoration efforts maintain and/or enhance the quality of life of residents in the analysis area. Diablo Trust quality of life info Firescapes. Firescapes are sub-landscapes within the analysis area which encompass >200,000 acres and where mechanical thinning and fire can be applied in a strategic and	iv.	Consistent - Outcome from project objective/Effects Analysis

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	systematic manner for restoring fire adapted ponderosa pine conditions. The goal is to create a contiguous geographic area where natural fire and other disturbances can be safely restored over a time-period of approximately 5 to 20 years, depending upon existing conditions.		
Firescapes			
a. Conservation of biological diversity	There is low potential for unnaturally severe fire to spread across the firescape.	i.	Consistent
	Protect old-growth forest structure during planned and unplanned natural ignition	ii.	Consistent - Project Design/Mitigation/Implementation
	fires.		
	iii. Natural and prescribed fires maintain and enhance, but do not degrade habitat for listed, rare and sensitive species.	iii.	Consistent - Project Design/Effects Analysis

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	Habitat management is contributing to the recovery of listed species.	iv.	Consistent
	Wherever practicable, natural fire regimes regulate forest structure and composition.	v.	Moving towards this but not expected that fire alone will regulate/maintain forest structure condition in the long term
	Planned and unplanned fires support diverse native understory communities and their associated biodiversity.	vi.	Unplanned is mostly outside the scope. How treatments (when combined with past, present and foreseeable) may affect ability to use unplanned ignitions will be addressed in the effects analysis.
	Populations of native species occur in natural patterns of distribution and abundance.	vii.	DC is forest-wide not project-specific
	Forest conditions facilitate species' movement to and from adjacent landscapes, ecosystems or habitats.	viii.	Project Design/Effects Analysis
b. Ecosystem resilience	There is low potential for unnaturally severe fires to spread across the firescape.	i.	Consistent – purpose and need, refined proposed action design
	Strategically placed treatments allow fire managers to safely manage planned and unplanned natural ignitions fires in a	ii.	Unplanned ignitions are not addressed as a desired condition and the term strategic placement is not used. How treatments facilitate management of unplanned ignitions (line officer decision) will be part of the fire effects analysis.

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	way that benefits and enhances the resilience of forest ecosystem.		
	Restoration results in forests that are trending toward natural variability, self regulating, and positioned to adapt to climate change without large, rapid type shifts. Move toward resilient forests.	iii.	Self –regulation is not part of the desired condition. Ability to adapt to natural disturbances and movement towards resiliency - consistent
	Where possible, natural fire regimes regulate forest structure and composition and align forest changes with climate changes.	iv.	See comment to iii.
	Natural disturbance processes (e.g., fire, endemic pests and pathogens) occur at endemic levels.	v.	This is a desired condition for the analysis area – ponderosa pine type-wide and not specific to any one particular restoration unit (formerly known as a firescape).
	Exotic species are rare or absent and do not create novel ecological communities following disturbance.	vi.	Forest plan requirement – built into proposal design – project-wide not specific to any particular restoration unit unless team botanist has identified areas of concern where practices need to be site-specific.
C. Conservation and maintenance of soil, water and air resources	Strategically placed treatments allow fire managers to manage planned and unplanned fires in locations, seasons and	i.	See previous response. Burn plans address season and conditions that will maximize smoke dispersion (implementation). Key for the analysis is to disclose potential for effects and need to comply with ADEQ regulations.

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	conditions that maximize smoke dispersion and minimize smoke impacts.		
	Emissions factors, smoldering, and smoke residence time are reduced as fires burn more grass and less green or woody biomass over time.	ii.	This is an effects analysis disclosure element
	Stable, restored ecosystems foster watersheds that yield enhanced water quantity and quality and are resilient to climatic variability.	iii.	Consistent
d. Economics	Fire management costs are reduced; aggressive fire suppression is unneeded or rare.	i.	This is not a desired condition for this NEPA analysis –may be better displayed in effects analysis (outcomes of restoration in short and long term) is more appropriate as an overall goal or objective
	Mechanical treatment costs are reduced.	ii.	See previous response
e. Social Systems	There is low potential for fires to enter communities.	i.	Consistent
	Rural communities play an active part in reducing fire risk by implementing FIREWISE actions and creating defensible space around their property	ii.	Not a NEPA desired condition – how adjacent landowners (state, private) have affected potential for fire on their properties would be used in cumulative effects
	Strategically placed	iii.	See previous response

Theme	Landscape Strategy Desired Condition	Reference Location	4FRI Purpose and Need Crosswalk
	treatments allow fire managers to safely manage planned and unplanned natural ignition fires without loss of human life and property, or severe environmental impacts.		
	Strategically placed treatments allow fire managers to manage planned and unplanned natural ignition fires in locations, seasons, and conditions that maximize smoke dispersion and minimize smoke impacts	iv.	See previous response
	Emissions factors are reduced as fires burn more grass and less green or woody biomass over time.	v.	See previous response
	The public understands, accepts, and supports fire's natural role in forest ecosystems	vi.	This is not a desired condition in terms of NEPA – may be most appropriate in the project Communication Plan (goals/objectives)

Appendix E – Public Meeting/Workshop Notes

February 16, 2011, 4FRI Workshop Firescapes 5 and 6, Coconino National Forest Supervisor's Office

- Kristin Bail gave opening remarks and welcomed participants.
- Seven new participants attended today, five of whom were not in the stakeholders group.
- Henry – next Thursday we will summarize what we have heard in the workshops. We are also planning an after-hours and/or weekend meeting to try to catch additional members of the public.
- Henry gave introductory presentation.
- Questions/comments regarding introduction:
- In the objectives is restoration of aspen, springs, meadows. When will maps be available for aspen restoration? We have maps for 700 acres from ERI. We have maps of spring locations, but don't have treatment proposals yet.
- Do you see the maps being developed throughout the process? Yes, through the workshops, other public meetings and district meetings we should have a refined PA. We expect to have another public meeting to present the refined PA. We haven't determined if we will need to extend the scoping period or not.
- How many alternatives will you be evaluating? Don't know until we review all comments and identify issues. Right now we have the existing condition and the refined PA.
- Will the powerpoints be put on the website? Could they be placed on You-Tube? These are also available on basecamp and you can contact Steve Gatewood to get a password to access basecamp.
- When does the initial scoping period end? On March 11, we will continue to accept comments throughout. As the PA is refined, we may have another scoping period.
- Henry – gave introductory road decommissioning presentation.
- Questions/comments related to roads: In the yellow portion of roads, is there a plan to evaluate these for adequate drainage and do anything about it? No, we are not analyzing that. We don't have the capacity to do that. We will simply do measures to naturalize the ¼ mile segments.
- Mary – gave introductory fire presentation.
- Questions/comments regarding fire: What parameters were changed for the Tusayan District vetted Schulz Fire weather map? (Mary explained changes)

- Did you run this by the Coconino fire folks just like the KNF? Yes.
- They were comfortable with these where Tusayan was not? Yes
- I'm looking at the Hart Prairie area and it is not showing a lot of crown fire in there, and I know there is some. Mary: Would it help to show the passive crown fire information too? The passive fire could get up into the trees at any time.
- Bill – gave introductory wildlife presentation. Bill brought up dispersal habitat and need for designation of these.
- Dispersal habitat – are you looking at it as foraging or nesting habitat? It is to encourage PFA habitat. It will depend on site specific conditions about how this is done. It is a DC.
- Neil – gave introductory vegetation presentation.
- How are you defining young trees? Young is based on the VSS class, such as VSS 3 (5-12 inches).
- There is a noticeable contrast between Firescapes 4 and 5, why? Cinder soils and prevailing winds are probably causes.
- The % opening shown on the maps applies to stand level and how are you tracking canopy on a larger scale? Not just a stand scale, but a larger scale? I am not talking about canopy cover or the density of remaining forest stands. What is indicated by the % is the amount of opening.
- So a 50% opening does not mean a remaining canopy cover of 50%? Yes that is correct.
- Isn't there a correlation between the SI and opening %? I am not including an indication of forest canopy cover in the %, it is opening %. In the Goshawk Guidelines there are canopy cover amounts, we would follow the guidelines.
- Will the VSS distribution only count across large landscapes?" VSS is a classification of forested cover.
- This may get us to the discussion which is the guideline requires that the analysis occur at 3 different scales, I am not sure what scale you are talking about? As you shift scale, the % that you are describing at one scale may be changed at another scale"? The guideline says in VSS 4, 5, 6 you will retain canopy cover of 40%. The only place where the canopy cover exists is at the stand scale. Henry – the 1996 amendment does not define the scales, it says large and small. The numbers displayed on our maps equates to openings, not canopy cover. There is no direct correlation between canopy cover and the openings indicated. The canopy cover guidelines apply to VSS 4, 5, 6 trees. Across the landscape when you encounter VSS 4, 5, 6 you must maintain the canopy cover required in the guidelines. Grand Canyon Trust provided a process that can be applied across the landscape to show the percent canopy cover.
- This gives some idea of what the forest will look like, will you get more specific with canopy cover and arrangement of groups? We have to get more descriptive, but we probably won't be able to give you specifics of each stand. We will find representative

stands with treatments and run it through the forest simulator so that we can model these and tell what will happen.

- Communication problem exists between the % shown being openings and canopy cover remaining, you need to bridge gap so that there is understanding of what is being said.
- You need to be able to articulate what is left in the forested stands. There is not an inverse relationship between openings and canopy cover of remaining stands. When you show a stand it will be classed as VSS 1-5 and shows the % opening. You will have groups of trees within the stand.
- Does each group get classified? Or does the stand? We are trying to get heterogeneity within the stands. A treatment area can represent one stand or several, it is a similar treatment. It doesn't say if it is even aged or uneven aged. The design would maintain 40% canopy cover in a diversity of age groups or if it is even aged, will begin to create uneven aged. The goal is to take advantage of natural openings or create openings so that you are getting the group and gap structure.
- (Regarding map showing similar % openings across the different treatments in a gradient of one color) In any treatment color, there is variance within these? The stands are a polygon of like conditions; from there we can determine effects and post-treatment conditions. There is variation within a treatment color. This is not prescription, we will build in heterogeneity with prescriptions. We manage canopy cover at the group level within VSS 4, 5, 6 trees.
- Is the canopy cover the same in the savannah treatments? You are mixing canopy cover and opening. If you have a savannah and there are VSS 5 and 6 existing, you will retain those. Pre-settlement evidence will play an important role in the pattern that trees would be left.
- I am confused, isn't it usually tree groups where VSS is applied, not at the stand level? When prescriptions are made, the entire stand will be considered, and groups of VSS 4, 5, and 6 will have 40% canopy cover.
- Will there be a need to create VSS 1 in every stand (a regeneration opening versus a natural opening)? VSS 1 will be included if it is appropriate in a stand.
- Does the information about VSS 1 logic apply to VSS 6? The objective is to have a diversity of size and age classes across the landscape. You focus on the under-represented size classes on the landscape, these are typically in the VSS 1 and 2 and 5 and 6. In order to get a diversity of ages across the landscape, you create regeneration openings. These are often created in the over-represented VSS 3 and 4's.
- The literal application could lead to places where VSS 6 are cut in order to make room for VSS 1, will this include old-growth trees? Will we cut VSS 5 and 6 and pre-settlement trees? I don't know yet, there is more analysis needed and I can't tell you yet.
- I have a question about adaptive mgt, how will you monitor canopy cover to achieve the objectives?" That is a question for another time, we need to have that discussion at a later time—we don't know how that will be measured yet.

- When you are looking at scale accounting for VSS, if you have too many VSS 5 and 6 in one place, will they be accounted for in other places? We really cannot give you that answer yet, in terms of evaluation, it will be made at those levels.
- I'd like to see an answer. We will take your finalized large tree retention strategy and do the analysis that we need to do. We will have that discussion and there will be a decision made based on the data.
- We've had a lot of difficulty in the past about regeneration openings versus natural openings. Can you not designate some of the natural openings as some of your VSS 1 openings? So that you don't have to create an opening in VSS 5 and 6? We were trying to create a shifting mosaic? There are opportunities to use all kinds of openings so that you can create the gaps and groups and a diversity of age classes.
- When you are talking about implementation strategies, where will that come out? Through comment analysis and development of issues and alternatives.
- Are you talking openings? This will vary based on site productivity and what is out on the ground.
- When will we have a chance to comment on these? If we have a range, it does get back to adaptive management. When do you put out those ranges for other measurements?
- The forest plan descriptions for DC would be beneficial. Those are pretty general, I'd like to see more specific—we will emphasize this BA, opening size. How do we get at those metrics? Look at the size of this landscape.
- Will there be a document that will get at the specifics? Will the public have a chance to comment on prescriptions? No.
- 4FRI stakeholder documents discuss not cutting old-growth trees, and the 4FRI PA says manage for pre-settlement trees. Do you mean at this time in the discussion or do the stakeholder documents really count? The two don't relate? It would be pre-decisional for me to say what the decisions will be, I don't make those decisions.
- There is a reluctance to cut pre-settlement trees and it is documented by the stakeholders. It would be really useful to provide advice to the 4FRI about how to address these questions.
- Smaller site specific documents give more detail. I don't see how the standard for this large document can avoid that same specificity? Do you want a stand by stand analysis? There are 30,000 treatment areas identified.
- Could you give detail by treatment area and give descriptions for those? That is what Neil is planning to provide.
- Are you thinking about more description about the treatment type or within treatment areas? Within that area we can give a range for VSS 4 tree groups.

- We aren't challenging the work you have done and presented, this is just the next step in refinement, and we are trying to provide suggestions or concerns. The next step is description. I think there was some confusion and we need this discussion.

Firescape 5 has 2 treatment areas: 5-1 and 5-2.

- Comments/Questions regarding Firescape 5: The area south of the peaks and in the dry lake hills—the Rio del Flag watershed is a top priority, it is also identified in the CWPP for Flagstaff.
- Are treatments for aspen differentiated? It is difficult to map at this scale.
- 5-2 Any comments on this?
- We talked in Williams about dropping some of the transitional areas. Is this dropped in terms of analysis?" We expect to take the info that you have provided and get the forest site specific info.
- Drop the transitional areas on in Firescape 5.
- I am concerned about dropping these, since there might never be a chance to treat them.
- These have different conditions that we aren't really analyzing in this project.
- Highlight the small places of aspen.
- In the transition areas, these would be excluded from mechanical treatments and not fire.
- The cinder areas are very susceptible to drought. We should look at treatments to benefit soil moisture, snow pack retention, etc. In terms of soils, I think no mechanical treatment, and just let fire do its work.
- This is an area of invasive weeds, and probably deserves attention.
- This would also be a risk to weigh when doing treatments. Weeds do hold a strong place, and we could prioritize areas for eradication, we haven't identified these. We will survey the weed prone areas.
- In the Fort Valley area, I would be interested in a configuration that reduces fire and wildlife connectivity, especially for black bear. I think there is a way to do this and meet the fire risk objectives. We may want to look at adjacent areas too.
- There are wildlife corridors identified in Ft Valley. Do you think Ft Valley has been covered with previous work? No.

Firescape 6

- I'd like to recommend that you look at the Kaibab Forest Health Focus, the group looked at treating heavily with just fire. It pointed out two large treatment areas, 15 mi E-W and 1-4 miles from the GCNP, and Coconino Rim area.
- Need to show boundary of Coconino Rim IRA. (Mark found this and displayed it).
- There are some questions remaining about the Tusayan District vetted area. Mary clarified the fire modeling change between Schulz Fire and the Tusayan fire comments. Discussion with district was used to identify changes in parameters. Passive crown fire may be over-represented.
- One thing we talked about was that Tusayan was burning more because of the fire work that had been done. The satellite data should have picked up the change in crown base height if it had been raised by the past fires. Do you think it is under-representing the crown fire potential? I'm concerned that it is using perception versus data that we have. Part of what you are seeing is the difference in satellite data where we have it, in other areas we don't, but can apply fire history data.
- There is juniper-sage that is over-represented in crown fire potential.
- Firescape 6: There may be springs that are affected by the area, and this should be taken into consideration when treating the area.
- We are concerned about elk movement in and out of the Park (don't want more).
- Given the sparse active crown fire areas shown, and the wall -to-wall mechanical treatment areas, I recommend that you look at the combination of these and I question the need for treatment outside of those areas. If you can give me specific areas to model for fire that would be really helpful.
- Aren't we talking about restoration across the landscape?
- Is mechanical treatment necessary or could fire achieve the objectives? The balancing act is between economics between whether there is a need for treatment and doing small areas. If we want to do some restoration, most of the current treatment is non-commercial. I don't believe they are getting to restoration levels with these treatments. Industry will have to be able to treat these acres economically.
- Yield and extent are important economically.
- If we get a where to treat, it is about 300,000 acres. There is probably less social license with treating more. We do not have the capacity to run a "Finney" model.
- "The alternative may be to look at the high severity areas, and then other areas to protect. Remember that the removal of fire risk is one element; treatments are also centered on pattern and composition.

- Take into consideration where the historical activities have happened which has altered the structure and function. In 6-2 there are more frequent fires, and it might be more conducive to the overlay of fire risk and mechanical treatment.
- We talked about strategic placement of treatments; the request is that if treatments are proposed, there is description of why they are placed there. Otherwise it looks like treating everywhere possible versus strategic. One of the layers that would be helpful is where we are getting crown fire under treatment prescriptions.
- “In working group we talked about buffering these active fire areas to isolate them from other areas. A lot of the crown fire is surrounded by passive crown fire, where a gust of wind would carry it to the crowns and you are up and running.
- I think we eliminated a lot of active fire, and the candidate areas are limited to the distribution of pixels.
- FlamMap outputs are supposed to give you a landscape basis. Passive crown fire typically kills the large diameter fires since it climbs into the crowns. We want to focus on these trees. I think it is an undesirable condition.
- Are you coordinating across the boundary with the Park, and the likelihood of fire moving back and forth? We haven’t coordinated about the proposed treatments; I don’t see us doing something different on the boundary.
- Can you put on the road layer so that we can see what access we have in Tusayan? There is good access.
- We have had discussion about crown fire, passive crown fire torching, restoration, and fire only. We also need to take into consideration past treatments.
- Need to make some site specific decisions, but we need to do more than we have done. You mentioned treating at the head of Sycamore Canyon, what is the resource at risk?
- If there is not extensive treatment, then it will not work economically.
- I’m concerned that this area could fall out; couldn’t we look at a way that treatments could happen there? Could fiber be used more locally? This is getting pretty far into the weeds. I don’t want to get into economics too far, we need to identify needs to mechanically treat for restoration.
- We have gotten away from does this meet DC? This may not be a priority now, but we need to define the restoration needs. I will take this back to the districts following the public meetings.
- Remember to review the KNF Health Focus.
- I recommend 6-2 and 6-3 for mechanical treatments, but perhaps not others. These are adjacent to GCNP and the Navajo Nation. Perhaps there are other places that are not as high priority.

- For a general comment on Tusayan, it has a lot of sage component in the pine and P-J, if we think of ecological restoration, there are unique communities that are just as threatened. From an ecological argument, the sage community would be a top priority. There are strong reasons for treatment here.
- Drop 6-1
- 6-4 Candidate areas are limited to roads.
- Other comments: I have grave concerns about smoke due to allergies and respiratory problems. I'd like to ask on behalf of others who have these problems, that you deal with slash piles and use another method to treat these. We went down to talk with AZDEQ air quality folks. We don't have an answer yet, we are hoping to broaden the window so that we can burn when it is warmer and the smoke doesn't settle down as much as when it is cold. We are trying to address the piles—what is the best way to burn these-- a few at a time or all at once?
- 4FRI is trying to address the need to treat large areas, and industry stakeholders are included. The only way to utilize both the tree trunk and the biomass. In the most likely industry scenario, you wouldn't have pile burning, the biomass would be collected and utilized. The operations that are being looked at are biomass pellets and biomass thermoelectricity. It may not be a critical issue for 4FRI.
- Is it next year?
- The NEPA decision would be in 2012, but requires rebuilding an industry infrastructure, so implementation would be in 2014. This is a short timeline considering the quantity of area proposed for treatment.
- In the White Mountain Stewardship project the concern is having enough forest litter. There will be burning associated with ecosystem needs.
- Is there a different way to deal with the forest litter? Fire is a critical part of the ecosystem, and we are trying to broaden the window so smoke is not as much of an issue.
- The amount of fuel produced after treatment with pile burning or wildfire, it is very small.
- The alternative of intensive wildfires is not a good one.
- I am not against all fire, I just want to emphasize smoke management.

Wrap Up

- For next Thursday's meeting, 4FRI will compile the comments we have heard. We want to run these back by you guys. We'd like to show you some of the changes. We will use these to refine the PA.
- Is this an opportunity for us to discuss some of the themes? Could we see these ahead of time? There will be one or more meetings where we can show the refined PA, and get comments back on it. We may need to extend the formal comment period.

- Do you have a timeline? When we are ready with the refinements, we will send those out ahead of the March meetings. After scoping, we will go into alternative analysis.

Questions:

- When will maps be ready for wetlands and aspen? *Assessments are underway; springs are mapped, but aspen treatment areas are difficult to map – there will be refined PA out approximately mid-April.*
- How many alternatives will be evaluated? *That should be known around mid-March.*
- Did Coconino fire review the PA firescape? *Yes, with agreement; Tusayan thought the risk overstated.*
- What are the Goshawk dispersal aims? *Expand foraging; seek expanded nesting areas.*
- How do you define “young” trees? *As those approximating VSS3 (8.5” dbh average), noting that age and size do not always correlate closely, and age diversity is desired*
- Why the difference in TA’s between Firescapes 4 and 5? *It is largely due to different soils and topography.*
- What is the relationship of canopy density and percent openings? *There is no direct correlation; the percent opening does not affect the canopy closure of the groups remaining, and there is no implication of canopy closure by a given percent opening.*
- How will you keep VSS guidelines with areas of large gaps? *Gaps equal the percent of non-forested area. Guidelines for VSS 4, 5, 6 are approximately 40% canopy closure measured at the group scale.*
- Will the specifics of each TA be descriptive of canopy closure? *That is not possible under the present process, but reference sites will be sought for modeling.*
- Can you provide some communication relative to the relationship (or lack thereof) between percent opening and canopy closure? *Yes, there will be a description of the relationship or lack of relationship soon.*
- How will details be developed for VSS’s per polygon in the firescape? *These will be included at the implementation level, where the relationship among stands (VSS distribution) will be evaluated to ensure heterogeneity.*
- How is canopy cover calculated for Savannah? *Under development.*
- At what scale are treatments described? *The scale is site dependent with project level clarifications and adjustments, with those decisions made within a larger spatial context*
- Will the need for VSS1 mean removal of VSS5+ trees? *No*
- How will canopy closure be monitored? *That will be described later in the process, as part of a monitoring/adaptive management plan and process.*

- What is the ultimate spatial scale for adaptive management? *That decision will be made after reviewing comments and workshop results and available data.*
- Can some areas be designated VSS1 as is? *That is very likely, especially with remnant skid trails, landings, etc., in order to address sequencing and other time related aspects*
- When and where will detailed implementation strategies be available? *There will be no separate EA's for implementation, but assumptions and criteria for designations will be available. At this point in the process, commitments cannot possibly be made, as they would be pre-decisional.*
- Will transition areas be dropped from the analysis? *They are different ecosystems, and each will be considered individually, especially in reference to fire and mechanical treatment needs*
- Should treatments take place outside of fire areas? *Yes, there are other issues beyond just fire. Other treatments than mechanical thinning are available (i.e. fire); and economics are important in assessing mechanical treatment availability.*
- Is there coordination with the National Park Service management objectives re FS 6? *There is coordination at the forest level; there is likely minimal impact.*

Comments:

- Road drainage assessments should be done with ephemeral channel restorations
- Draft Forest Plans provide useful descriptions
- There is an overall desire to retain old growth trees and stands
- This EIS may not be specific enough
- It would be useful to have definitions by TA, with emphasis explained
- Smoke is a big concern, and should be carefully mitigated
- Rio Flagstaff is crucial for North Flagstaff protection (FS 5-1)
- In FS 5-2, there should be special attention paid to soil moisture retention; non-native invasive species; San Francisco Peaks weed management area, and; the relative low benefit to cost ratio
- In FS 5-2, Fort Valley, there are important wildlife migration corridors (ex. bear) that may need special attention, and should not be excluded
- Forest Health work and ideas are useful for FS 6-4
- Fire modeling results for FS 6 are based on reviews, with little to no data available; original was landfire data, and crown heights were not visible with satellite images. It may be possible to add metrics from field data
- FS 6-4 does have some access to the northern section

What We Heard by Firescape and Treatment Area (TA) - at the February 2nd, 9th and February 16th 4FRI Scoping Workshops

Firescape 1, Treatment Area 1

General Discussion/Notes

Minimal treatments are needed in this firescape due to past and on-going projects that have been conducted. Assumption: past projects will not be analyzed in this EIS if they had a restoration intent (achieved a restoration objective)

Treatment Priorities/Recommendations:

1. Currently areas proposed for treatment on the southeastern border of Firescape 1 (vicinity of Walnut Canyon) may be dropped— is primarily pinyon-juniper with some ponderosa pine
 - **Action Item:** Determine if these areas are to be added - determine if there is potential for fire only (no mechanical RX)
2. Vegetation and fire treatments need to be considered in the airport area
 - **Action Item:** Evaluate adding this (what/where/why) in refined PA
3. Fire layer – Anderson Mesa shows up as having crown fire attributes because it is a grassland/shrub model. The vegetation layer shows treatment in this area – needs to be corrected – is already being addressed with past/on-going projects
 - **Action Item:** Remove vegetation treatments, pull out the grassland/shrub fuel model – updated data will be reflected in refined PA
 - **Action Item:** Define what projects are past/on-going (and answer what/how much, where, when, how, why)

Firescape 1, Treatment Area 2

General Discussion/Notes

- Many burned areas are within this TA – some pine stringers that would have once needed treatment no longer exist, example is Yellow Jacket Spring
- Al's Lake – pine transition zone (Anderson Mesa)
- Candidate Treatment layer includes ¼ mile recreation site buffers, what does this mean? Indicates that treatment is desired to protect infrastructure from fire.

1

Firescape 1, Treatment Area 1- General Discussion/Notes

- Minimal treatments are needed in this firescape due to past and on-going projects that have been conducted. Assumption: past projects will not be analyzed in this EIS if they had a restoration intent (achieved a restoration objective)

Treatment Priorities/Recommendations:

- Currently areas proposed for treatment on the southeastern border of Firescape 1 (vicinity of Walnut Canyon) may be dropped— is primarily pinyon-juniper with some ponderosa pine
- **Action Item:** Determine if these areas are to be added - determine if there is potential for fire only (no mechanical RX)

- Vegetation and fire treatments need to be considered in the airport area
- Action Item: Evaluate adding this (what/where/why) in refined PA
- Fire layer – Anderson Mesa shows up as having crown fire attributes because it is a grassland/shrub model. The vegetation layer shows treatment in this area – needs to be corrected – is already being addressed with past/on-going projects
- Action Item: Remove vegetation treatments, pull out the grassland/shrub fuel model – updated data will be reflected in refined PA
- Action Item: Define what projects are past/on-going (and answer what/how much, where, when, how, why)

Firescape 1, Treatment Area 2 - General Discussion/Notes

- Many burned areas are within this TA – some pine stringers that would have once needed treatment no longer exist, example is Yellow Jacket Spring
- Al's Lake – pine transition zone (Anderson Mesa)
- Candidate Treatment layer includes ¼ mile recreation site buffers, what does this mean? Indicates that treatment is desired to protect infrastructure from fire.
- In Inventoried Roadless Areas (IRA), no treatment or prescribed burning is included in the PA (treatment would need Secretary of Agriculture approval and IRA has already been burned – no need for change)

Treatment Priorities/Recommendations

- Include ponderosa pine that was part of the Mint project (analysis that encompasses parts of TA 1-4 and 1-5) completed about 15 years ago – restoration was not a theme for this project – is located in the general vicinity is the very southern tip of the TA and 125 Road, below and east of Mormon Lake
- Action Item: Evaluate potential for treatment in this area – is still being implemented, about 1,000 acres were recently successfully burned – check with district
- Candidate Treatment layers shows the AZ Trail buffer but does not show much vegetation in the very southern tip of the TA (south of 124, 125 Road), fire layer shows need in this location – may need mechanical treatment
- Action Item: Evaluate potential for treatment in this area

Firescape 1, Treatment Area 3 - General Discussion/Notes

- Many areas do not show up as needing treatment, why? Upper left portion of the TA is Mountaineer and Elk Park – already treated
- Difference in FS data and Candidate RX Layer: Eastern Boundary – Lake Mary Watershed – FS fire layer shows crown fire and high intensity surface fire risk – candidate treatment layer does not show fire because it is smoothed to 50 acre and 97th

percentile – Mary Lata did confirm fire potential with district fire professionals – agree with data because of steep slopes and ridge tops

- For MSO, USFWS and FS are deciding what treatments are needed for 117 PACs – about 11 PACS are scheduled to be treated in other projects - if habitat cannot be improved – no treatment would be proposed
- Regarding treating around PACs to decrease risk from fire – if habitat is suitable, may not want to treat in order to expand owl’s ability to move into these new areas
- Firescape 1, Treatment Area 3 – high priority for treatment

Treatment Priorities/Recommendations

- Northern goshawk PFA has not been excluded in FS layer – we can treat PFAs –but if already too open – no RX would be proposed – candidate treatment layer excluded mechanical but would be ok with hand thinning nest stand
- Action Item: Final RX needed for refined PA
- Portions of Lake Mary Watershed have severe headcutting in many drainages – FS has (Coconino) forest-wide map of headcuts that has been gathered by district hydrologists. Kaibab is requesting information from soils and watershed specialists.
- Action Item: Use data for refined PA – Objective for Lake Mary Watershed – restore to historical condition as reasonable/practicable: (1) Treat to reduce the potential for increased sedimentation from crown and high intensity surface fire (note: any change in water yield would be described/projected in the soils and watershed effects analysis); (2) Use design criteria, BMPs to mitigate noxious weeds, non-native invasive species, use weeds database
- Newman Park – proposed vegetation RX would be savannah, grassland and IT (intermediate thin). In addition to vegetation RX, area has headcuts that should be restored. Note: Is part of the Lake Mary Allotment (is a grass bank) that could be used by the Walnut Allotment but not before infrastructure and fencing needs are addressed
- Action Item: Include headcut restoration treatments specific to Newman Park
- There are springs that need restoration: Babbitt – needs fencing and pipe reconstruction, Clarks Spring is within a PAC. Restoration has been proposed in the Elk Park project, Hoxsworth – treated in several projects
- Action Item: Review Babbitt for inclusion into the PA, confirm other analyses have sufficiently addressed Clarks and Hoxsworth
- In this TA (1-3) also include restoration/treatment around springs, seeps, meadows and dry ephemerals to reduce sedimentation potential – use treatments similar to Hoxsworth treatments
- Action Item: Review areas for restoration in refined PA

Firescape 1, Treatment Area 4 - General Notes

- Eastern half of TA is very open
- Western ½ - only treatments on the Candidate Layer Map is buffers along roads, whereas FS shows much treatment
- FS fire layer show crown fire potential from shrub and ponderosa pine fuels
- This treatment area has many PACs and the presence of mixed conifer in vicinity of Hutch Mtn. limits treatment opportunities. We would not want to increase the potential for off-road vehicle use in and around PACs and extensive work on powerline (which occurs in PACs) has already occurred.

Treatment Priorities/Recommendations

- What analysis was completed for the 365 KV line? Action Item: Locate

Firescape 1, Treatment Area 5 - General Notes

- High number of PACs – Mormon Mountain, Bar M – mostly pine-oak
- Per wildlife –promote oak – however, where the PAC productivity is high, mechanical treatment would not be considered
- 1,000 acres of leafy spurge has been treated (at 40 acre size) using biological control and herbicides in this TA
- Bottom ½ of 1-5 is covered by Mormon Lake Basin, Munds and Upper Beaver Creek projects
- Not many opportunities to protect MSO PACS
- Lee Butte is a PAC – open pipo and oak – large threat of fire but drainage bottoms are generally open (with some encroachment)

Treatment Priorities/Recommendations

- Treat between the highways (east of I-17 in the Rocky Park area) and PAC boundaries to reduce fire risk. Note: There was an older fuels project that occurred west of I-17 in very rocky terrain.
- Action Item: Evaluate risk to PACs and inclusion into revised PA
- Treat transition areas both east and west of the PACs (would include TA 1-4 and TA 1-5) – Taylor Area and Lake Mary Road
- Action Item: Evaluate risk to PACs and inclusion into revised PA
- In Bar M Watershed – recommend 5 acre (large) clusters of groups for wildlife – smaller openings would be consistent with proposed treatments as shown on map
- Action Item: Evaluate for inclusion into refined PA

- Since there are limited opportunities to protect MSO PAC s, there is a need to reduce the potential of fire from the south-southwest – use presence of I-17. May be fire only due to terrain limitations.
- Action Item: Evaluate for inclusion into refined PA
- Treatment between LM Road and TA 1-4 is a high priority as there is high fire potential in a few areas around the PACs. See Map - below the label 1-5 is habitat where owls can expand – good example of where treatment would not be desirable. Use treatment optimization model to assist in mitigating risk.
- Action Item: Evaluate for applicability to refined PA
- Summary of Priorities: (1) Treat east and west of I-17 in TA 3-5 to protect PACs, old growth, turkeys, etc. (2) Treat between PACs – wildlife input needed on habitat type, input needed on non-native invasives potential, (3) Model to address issues in 1-5, south ½ of Firescape 3-5 (SPOTS) in vicinity of Rocky Park, Willard Springs, Sheep Springs, (4) Model between 2 large PACs
- Evaluate which springs could be covered in this analysis
- Action Item – Review any other on-going analysis with spring restoration, evaluate for applicability to refined PA

Firescape 1, Treatment Area 6 - General Notes

- P/J dominated
- Some treatment is proposed along the Rim – the northeast side is covered by the Upper Beaver Creek analysis
- Treatment would address presence of old plantations – small trees
- Candidate layer includes road buffers and buffer around Apache Maid
- This is transition country – may provide opportunities for future hand thinning

Treatment Priorities/Recommendations

- Clear for treating ponderosa pine within the TA but considered low priority – by the time the forest is ready to treat, may need a Chapter 18 review
- Action Item: Evaluate for applicability to refined PA

Firescape 2 - General Discussion/Notes

- Candidate areas layer addresses road buffers
- Rarick Canyon Area – not likely to have treatment due to terrain and no fire potential
- Oak Creek Canyon – addressed in other analyses

Treatment Priorities/Recommendations

- Drop any treatments in this unit
- Action Item: For cumulative effects, get other Oak Creek Canyon analyses, evaluate applicability of treatment to the refined PA

Firescape 3, Treatment Area 1- General Discussion/Notes

- 3-1 includes an exclusion area due to the Bill Williams NEPA analysis that is underway
- Candidate layer displays buffers around roads, recreation sites, communities
- Western side of the TA is pinyon/juniper
- Dutch Kid Knoll Area – pronghorn migration area to Garland Prairie
- For clarification on potential treatment in transition areas, in areas where pine stringers of ponderosa pine are present, treatment would be proposed if the area is large enough. No other transition areas (mechanical treatments in p/j) are proposed.

Treatment Priorities/Recommendations

- Even though pinyon juniper is prevalent, include areas of ponderosa pine in this analysis so it is cleared for treatment. For clarification, no treatments in transition zones (p/j) are being proposed – vegetation has to be ponderosa pine-dominated.
- Leave more cover on knolls, slopes below the map label “3-1” – can leave areas more open else-where (related to wildlife corridors).
- Use prioritization, treatment optimization and strategic placement methods to address timing and sequencing
- Use a strategy that places/prioritizes additional treatments using criteria that includes proximity to roads (¼ mile from roads) upwind, downwind

Firescape 3, Treatment Area 2 - General Notes

- This TA includes a proposed RNA and Camp Navajo
- Project underway are likely to be rolled into 4FRI
- See area below 3-2 label by Garland Prairie → East of Camp Navajo – why are there so many different prescriptions? Needs a closer look – is coming from mountainous terrain to flats – different treatments reflect variations in slope, aspect, aspen island

Treatment Priorities/Recommendations

- In the large exclusion area there are timber sales that were never implemented, reconsider and make part of this analysis
- In the southwest corner (Elk Lee) below 3-2 is part of the Sycamore Watershed – watershed restoration which includes an objective of increased water yield should be part

of the proposal – in this area there should be larger tree group and breaks for wildlife. Elk Lee area may be designated as MSO target threshold habitat.

- Action Item– Consider suggestions/comments in refined PA, gather AZDGF wildlife corridor information, take closer look at area around Garland Prairie and Camp Navajo. Ask district for updated information.
- Action Item: West side of 3-2 (and west side of 3-3) needs treatment designed for increased water yield. This area is likely excluded due to four projects that are underway (already in contracting)

Firescape 3, Treatment Area 3 - General Discussion/Notes

- TA has Sycamore Canyon, checkerboard of private ownership, wilderness, grasslands
- TA 3-2 and 3-3 has some of the highest percent of crown fire and high intensity surface fire risk
- Proposed FS treatments line up well with candidate treatment layer
- There are no MSO PACs
- The southwest corner – northern goshawk PFA – the edges need treatment

Treatment Priorities/Recommendations

- Action Item: Needs treatment to reduce fire risk, Treat edges of PFA, West side of 3-2 (and west side of 3-3) needs treatment designed for increased water yield

Firescape 3, Treatment Area 4 - General Discussion/Notes

- Per Mary, crown fire as displayed on map is under-representing risk
- Likely to be MSO target threshold managed for larger trees and hard to treat as there are no roads
- There are many PACs (and many occupied), data goes back to the early 1990's – whether attributes are still in place needs to be determined

Treatment Priorities/Recommendations

- Exclude Woody and Kachina treatments and treat what is left
- Treat area above Munds Park
- On W. Fork of Oak Creek – strategically place treatments around this area to protect
- Do areas around lower 89 and west of 89 need treatments?
- Action Item– Consider suggestions/comments in refined PA

Firescape 3, Treatment Area 5 - General Discussion/Notes

Treatment Priorities/Recommendations

- Treat with fire west of I-17 to the Rim – terrain limitations
- Action Item– Consider suggestions/comments in refined PA

Firescape 4, Treatment Area 1 - General Discussion/Notes

- No uranium mining occurs in this unit
- Candidate layer displays buffering roads

Treatment Priorities/Recommendations

- No recommendations provided

Firescape 4, Treatment Area 2 - General Discussion/Notes

- City project north of I-40 is being implemented
- Layer displays 4 contiguous crown fire and high intensity surface fire north of infrastructure

Treatment Priorities/Recommendations

- No recommendations provided

Firescape 4, Treatment Area 3 -General Notes

- Sitgreaves Mtn area
- Eagle Rock Fire
- Much of the treatments are for grassland restoration
- Candidate area displays treating/buffering Sitgreaves Mtn
- Connects with Garland Prairie – savannah and grassland treatments would overlap with pronghorn corridor
- Potential impacts include aesthetics/visuals – private land owners
- There is a lot of ponderosa pine that is in good condition or is heavily infected with mistletoe in this unit
- For clarification, bigger gaps = less productive site

Treatment Priorities/Recommendations

- No recommendations provided

Firescape 4, Treatment Area 4 -General Discussion/Notes

- Candidate area displays treating/buffering roads, mtns
- For clarification, an Intermediate Thin with 10-25% gaps is displayed in the analysis as X acres of IT within a firescape
- Canopy cover (applies to VSS 4-6) is met at the group level – applied to the group of trees post treatment
- For clarification, the potential treatment layer as shown during the workshops does NOT mean that treatment would occur as currently displayed – still need to apply other resource filters and comply with the forest plan

Treatment Priorities/Recommendations

No recommendations provided

Firescape 4, Treatment Area 5 - General Notes

- Not much treatment displayed
- For clarification, heterogeneity is built into the PA in two ways: (1) variation between each treatment type (10% to 25% gaps = heterogeneity), (2) Actual prescription – on ground implementation

Treatment Priorities/Recommendations

- Check on projects that have not made it through scoping (Wing) – 4 FRI could use the stand exam, survey and roll the project into this analysis
- What about A-1? Will be needed in 10 years
- Action Item– Consider suggestions/comments in refined PA

Firescape 5, Treatment Area 1- General Notes

- Rio Flagstaff is crucial for North Flagstaff protection (FS 5-1)

Firescape 5, Treatment Area 2 – General Notes/Recommendations

- In FS 5-2, there should be special attention paid to soil moisture retention; non-native invasive species; San Francisco Peaks weed management area, and; the relative low benefit to cost ratio
- In FS 5-2, Fort Valley, there are important wildlife migration corridors (ex. bear) that may need special attention, and should not be excluded

Firescape 6 - General Notes/Recommendations

- Smoothing crown fire model data to 50 acre pixels may give a larger scale view, but would have some drawbacks

- Treating nearby areas may help lower threats to sensitive areas
- Economics may make mechanical treatments difficult in FS 6, unless a local use can be designated
- There should be a clear description of Desired Future Conditions for FS 6
- Swatch Canyon smoke impacts have been severe at times, so some other methods of disposing of slash needs to be considered.
- The rim in FS 6 may be a recharge area for canyon springs

Firescape 6, Treatment Area 2

- There are elk present in FS 6-2, as well as spring recharge areas
- This FS could analysis would benefit from more robust models for fire paths
- Many treatments will be to develop appropriate patterns and composition of stands
- Non-commercial and pre-commercial thinning can be used to alter structure and composition
- Field check the model assumptions for FS 6-2,3

Firescape 6, Treatment Area 3

- No comments

Firescape 6, Treatment Area 4 – General Comments

- FS 6-4 does have some access to the northern section

Scoping Workshop Presentation Highlights

Fuels/Fire

- Fuels/Fire – looking at crown fire, high intensity surface fire, ignitions across both forests, fire paths
- The fire return interval is approximately 20 years; it may need to be reduced to 5 to 10 years around urban interfaces.
- From 2001 to 2010, an average of 34,000 acres has burned per year (includes planned and unplanned ignitions) in ponderosa pine within the analysis area

Wildlife

- There would be no mechanical treatment on slopes greater than 40% (Mexican spotted owl protected habitat) – could use fire
- Mexican spotted owl restricted habitat (pine/oak) – 10% would be designated as target threshold; in restricted habitat, trees up to 24” dbh can be treated (see forest plans)

- At this point, looking at what Mexican spotted owl Protected Activity Centers (PACs) should/could be treated – key is that any treatment would need to enhance/improve owl habitat
- Northern goshawk nest stands and dispersal PFAs will be designated (vegetation treatments currently do not reflect these designations – still work to complete)
- Mixed conifer is not part of this analysis (component of Mexican spotted owl habitat)
- Compliance in terms of Mexican spotted owl has several tiers: Endangered Species Act → Mexican spotted owl Recovery Plan → Forest Plan(s) as amended in 1996 to incorporate Recovery Plan requirements

Silviculture

- Baseline data is coming from stand data (30,000 stand exams) with imputations where data is lacking
- Indicators used to evaluate treatment priorities include Stand Density Index (SDI), Basal Area (BA), Vegetation Structural Stage (VSS), trees per acre, site index (site quality rating)
- Types of treatments: (1) Uneven aged (UEA) – goal is to create un-even aged tree groups with gaps (non-forested openings between trees), create conditions that promote regeneration, thin to improve tree vigor and reduce competition between trees, allow faster growth into the larger size classes; (2) Intermediate Thin (IT) – used in areas with mistletoe – if mistletoe is at a high level/threshold – would be left as is, if it is present in lower levels – objective would be to thin, create gaps without regeneration in order to create conditions where trees could live with the mistletoe, (3) Stand Improvement (SI) - thin to create uneven-aged conditions (trees of all size classes are present) in areas that have experienced burns or were planted
- In grasslands (mollisol and mollic-integrade soils) historically there was low tree canopy – grassland treatments would move towards restoring grasslands
- In savannas, there was (historically) a higher tree canopy – treatments would be guided by pre-settlement trees and evidence
- Filters used to date include acres where project NEPA has been completed or NEPA is underway, special designations/areas such as wilderness, IRA, RNA have been excluded – additional filters and refinement still needed as of the February 16h workshop including wildlife corridors – areas where there are dense and less dense conditions, PACs, PFAs – how many acres are actually going to be treated
- General Comments and Questions (Note: 4FRI IDT will answer these questions and post on web)
- Forest ERA data is valuable at the mid scale, FS data is valuable at the smaller scale
- Note: currently the PA has no correlation to treatment areas or firescapes –will be addressed in refined PA

- Note: Firescape 1, Anderson Mesa – may be suitable for future restoration actions that stakeholders are developing
- How will headcuts be treated?
- What past actions caused/affected head-cuts?
- On roads to be decommissioned and on unauthorized routes (user-created routes) that are to be obliterated, if thinning occurs where these features are located, would they be used for project implementation? They would be used as needed and restored after treatment.
- 4FRI is providing an opportunity to implement travel management
- Is hand thinning being proposed on slopes greater than 40%? The DT would need specific areas where this is being recommended.
- Provide information on various silvicultural treatments and what area could look like pre and post treatment.
- Please put January 20, 2011 power-point presentations on the website.
- Please clarify terms such as site class, Stand Density Index and explain how SDI is measured for ponderosa pine (what is the maximum, what SDI indicates a healthy forest, what SDI indicates there is a problem).
- Provide additional information on different treatment proposals including photos of before and after and how treatment helps achieve desired condition. What would an uneven-aged treatment that resulted in various percentages of openings look like? Please provide this for all potential treatments and for each desired condition (reduced stand density, movement towards having all age classes represented).
- Where did the definition of firescape come from? Concept was summarized from the landscape strategy. Since this concept is part of the purpose and need, definition also includes the specific need for change that the FS used in developing the purpose and need including structure, composition and pattern.
- Will treatment areas be aggregated by firescape? Yes, that is the intent.
- What is the exact acreage within the analysis area? All acreages (analysis area and acres proposed for treatment) will be finalized by IDT and will be part of the refined proposed action.
- Do proposed treatments adequately address reduced fire risk in the urban interface? As the IDT refines the proposed action, how the actions meet the purpose and need will be assessed.
- In areas where intermediate thinning and extreme fire behavior overlaps, would treatments resolve fire behavior? As the IDT refines the proposed action, how the actions meet the purpose and need will be assessed.

- Are the more intensive treatments lining up with fire risk reduction? Vegetation treatments will be designed to meet fire objectives – to date fire and silviculture have not worked together to overlay data as data still needs some corrections – next step in the process is to have silviculture, fire and wildlife work together and request input from other key specialists such as heritage, soils and water, botany, recreation/visuals. Areas currently denoted as having vegetation treatments will decrease as errors are corrected/data is refined/other resource filters (including forest plan) are applied.
- Is potential tree mortality from prescribed fire being calculated? Is the Fort Valley mortality projection paper being used? Tree mortality can be calculated and mitigated to a large extent.
- Can natural fire ignitions be broken out from all ignitions? Yes.
- Can the analysis differentiate the risk of fire within grasslands and tree/shrubs? Yes.
- Have roads from other NEPA analyses been included in the proposed action? How (and when) would these roads be decommissioned if they are part of other on-going projects? It is likely that some roads evaluate in other processes have been included within the treatment areas. The road would not be decommissioned until project implementation is complete.
- How will decommission methods improve soils and watershed if only the first ¼ mile of road is obliterated? What if the entire length needed to be obliterated to remedy resource impacts? The IDT will consider a range of existing conditions related to road decommission and obliteration and the necessary range of actions needed to remediate watershed conditions. Having an option that allows for entire roads to be re-contoured if needed will be evaluated.
- What would happen to those roads that need decommission but are not located in an area where treatment is proposed? It is likely that other forest analyses and projects would have to address those roads.
- Would user-created routes be part of the proposed action? Currently, the proposed action includes obliteration of unauthorized routes (user created routes) on the Kaibab.
- Does the group and gap strategy in savannah create new/additional/more grasslands than reference condition? Large, severe fires have created new grasslands. There should be no net loss of forest.
- What is the average estimate for wood products? An average of 7 to 12 CCF (cubic foot) per acre is the estimate. One CCF equals 100 cubic feet.
- What data was used in determining forest productiveness? Is it equivalent to regeneration potential?
- Is target stand density index uniform across the analysis area? Answer: No – depends on site productivity.
- What is the existing basal area?

- Was Stand Density Index (SDI) used for openings?
- What process is being used to accommodate small multiple sites (less than 100 acres) at the larger scale?
- It is important to correlate the % openings with canopy cover with remaining trees and groups.
- Will proposed treatments protect Mexican spotted owl Protected Activity Areas (PACs) in Firescape 1, Treatment Area 3 where there are many PACs?
- Provide additional information on science used in identifying mollisol and mollic-integrate soils – post on web.
- If no regeneration is planned in areas with mistletoe, what is the long term plan? Future analysis would need to occur with options possibly including shelterwood treatment and prescribed fire
- What if more acres are cleared than can be treated? How would timing and sequencing be addressed if only 50,000 blocks are to be treated?
- Areas of pinyon-juniper transition are of concern versus interior ponderosa pine.
- For areas showing up on the map layers as being “cleared through other processes”, are they being re-considered? No, these will be addressed in cumulative effects.
- Has the objective of providing for greater heterogeneity been met in the proposed action? The proposed action has to meet the purpose and need for action. How well treatments respond to/move towards desired conditions will be assessed as the proposed action is refined and finalized.
- Where are the true grasslands and what forested areas are functioning within the grasslands?
- Note – on candidate treatment layer, upwind buffers only occur where they coincide with the CWPP. Are private land buffers adequate?
- What are the scales of analysis? Scale depends on the resource as the forest plan requires different levels for some resources. Scales of analysis will be determined/disclosed. When will maps be ready for wetlands and aspen? Assessments are underway; springs are mapped, but aspen treatment areas are difficult to map. Areas where riparian, aspen and gambel oak restoration are proposed will be part of the refined PA.
- How many alternatives will be evaluated? The refined proposed action will be sent out for public comment. Comments received from January 20th through the next comment period will be used to identify issues and develop alternatives.
- Did Coconino fire review the PA firescape? Yes, with agreement. Tusayan thought the risk overstated.
- What are the Goshawk dispersal aims? Expand foraging; seek expanded nesting areas.

- How do you define “young” trees? As those approximating VSS3 (8.5” dbh average), noting that age and size do not always correlate closely, and age diversity is desired.
- Why the difference in TA’s between Firescapes 4 and 5? Largely owing to different soils and topography.
- What is the relationship of canopy density and percent openings? There is no direct correlation; the percent opening does not affect the canopy closure of the groups remaining, and there is no implication of canopy closure by a given percent opening.
- How will you keep VSS guidelines with areas of large gaps? Gaps equal the percent of non-forested area. Guidelines for VSS 4, 5, 6 are approximately 10% canopy closure measured at the group scale. The treatments must comply with forest plan requirements.
- Will the specifics of each TA be descriptive of canopy closure? That is not possible under the present process, but reference sites will be sought for modeling.
- Can you provide some communication relative to the relationship (or lack thereof) between percent opening and canopy closure? Yes, there will be a description of the relationship or lack of relationship once the IDT has reviewed the data.
- How will details be developed for VSS per polygon in the firescape? These will be included at the implementation level, when the relationship among stands (VSS distribution) will be done to ensure heterogeneity.
- How is canopy cover calculated for Savannah? There will need to be consistency of descriptions re VSS and canopy closure.
- At what scale are treatments described? The scale is site dependent with project level clarifications and adjustments, with those decisions made within a larger spatial context
- Will the need for VSS1 mean removal of VSS5+ trees? Will be determined/disclosed
- How will canopy closure be monitored? The monitoring plan, which will be part of the action alternatives will describe how canopy closure will be monitored.
- What is the ultimate spatial scale for adaptive management? That decision will be made after reviewing comments, workshop results, available data, and specialist analysis.
- Can some areas be designated VSS1 as is? That is very likely, especially with remnant skid trails, landings, etc., in order to address sequencing and other time related aspects
- When and where will detailed implementation strategies be available? There will be no separate EA’s for implementation, but assumptions and criteria for designations will be available. At this point in the process, commitments can possibly be made, as they would be pre-decisional
- Will transition areas be dropped from the analysis? They are different ecosystems, and each will be considered individually, especially in reference to fire and mechanical treatment needs

- Should treatments take place outside of fire areas? Yes, there are other issues beyond just fire. Other treatments than mechanical thinning are available (i.e. fire); and economics are important in assessing mechanical treatment availability
- Is there coordination with the National Park Service management objectives re FS 6? There is coordination at the forest level; there is likely minimal impact.
- Road drainage assessments should be done with ephemeral channel restorations
- Draft Forest Plans provide useful descriptions
- There is an overall desire to retain old growth trees and stands
- This EIS may not be specific enough
- It would be useful to have definitions by TA, with emphasis explained
- Smoke is a big concern, and should be carefully mitigated

February 24, 2011 4 FRI Public Involvement Workshop Comments

Comment period to March 14. Refinements on PA will be worked on for next 2 weeks. A scoping report will be put out as well. Need additional public meetings to try to catch more of the public (weekends and after hours). The scoping period will be extended. Issues and alternatives will be out to the stakeholder group prior to the DEIS.

Firescape 1 – Treatment Area 1

- What is the definition of firescapes? 750,000 acre area that is broken into 6 firescapes based on watershed boundaries. Within these are treatment areas, and stands (homogeneous areas). Prescriptions will give basic treatment for that area, but these will be adjusted to conditions found on the ground. The change from the landscape group's definition is to add pattern, structure and composition.
- What does the rest of the stand look like? Are you planning to only measure canopy cover in the treed area, thereby excluding the open areas? The metrics stand density, site index.etc will be answered.
- How do you select within stand openings? In the implementation prescriptions there will be guidance.
- Will there be a description of your approach in the PA or EIS, so that the public will understand what you are proposing? There will be a description of the DC, metrics, standards and guidelines. You have also asked if there would be a way to visualize the pre and post-treatment conditions, we are gathering examples.

Treatment Area 2

- Was the Mint Project a fuel reduction or a timber project?

Treatment Area 3

- Introduced wildlife Goshawk and MSO layer.
- The FS has discovered an assessment of head cutting occurring across the forest. One area was Newman Park that we didn't talk about earlier, where we would be doing head cut restoration.
- City of Flagstaff has requested that the Lake Mary Watershed should be priority number 1 (part of record).
- What is the timeline about priority areas? We expect to indicate areas of greater concern. We can't tell you yet where the areas will be since we don't have a contract or timing issues for wildlife.
- There is a letter coming in regarding the Rio de Flag watershed.
- Will there be maps that come out with the revised PA?
- Will these be the potential treatments filtered by wildlife? How will you get at strategically placed and prioritized treatment areas? Will this next map actually show where treatment will occur; a subset showing where treatments will occur? Mary will be able to do some fire path modeling.
- When you go thru the refinement process to show the areas most at risk, you won't drop out lower priority areas, right?

Treatment Area 4

- Expect to naturalize the first ¼ mile of "closed" road beds, they would show on the refined maps. We are considering decommissioning the entire road segment.
- Why wouldn't you pull out the entire KV line as a project? It will be the same for any of these lines.

Treatment Area 5

- Bill/Shaula/Cary added 119 total PAC's in analysis area, 41 fell out because of MC, steep slopes, wilderness, 47 fell out because already treated, 17 had wildfire, 12 had high reproductive potential or habitat was really good. Proposing 17 PAC's for treatment, and 7 more that need field review. Light treatment in recovery areas, no treatment in nest areas.

Treatment Area 6

- What will the approach be in Transition Zones in both MC and PJ? Are they being analyzed and planned for treatment?

Firescape 2

- Only a minimal portion of this firescape is proposed for treatment

Firescape 3 Treatment Area 1

- Neil shared his philosophy about treating in Transition areas. If the area is dominated by ponderosa pine, it is a candidate for mechanical treatment. We know that there may be pine strings along the polygons dominated by PJ. We will try to determine if pine dominates, if not it will fall out. Some of these will require a site by site analysis since these are typically in an ecotone and microsite. There may be some areas that are in MC, but dominated by pipo that would be looked at as well.
- Will you use the same approaches that you have identified? There is no treatment designed specifically as a transition zone treatment.
- Will fire be considered in the wildlife areas?
- How are you determining a need to treat in the Transition areas? Based on BA within the stand polygon.

Treatment Area 2

- Is this the area that you are working on the post tornado plan or is this separate? These are not included, and focus just on the tornado path (4000 acres). Will you remove these from the maps?
- Treatment designed to increase water yield, has this been considered in any of the other treatments? Will it be dealt with quantitatively, monitored? Are you concerned about the effects of treatment for water yield?
- The whole Sycamore Canyon area would be a prime area to look at water yields and this would be a prime area to increase yields. Put thought into how the treatments would be laid out to include increased water yield. This includes both groundwater recharge and surface water runoff.

Treatment Area 3

- While there are a lot of prescriptions, there are only 4 ranges of resulting openings. Does this really get us to heterogeneity across the landscape? All actions need to meet the DC. The range within each opening percent represents some differences within areas.
- This area has the largest crown fire potential in the project area. There is a glitch in one area where there is more adverse fire potential. A site visit to this area showed there are thick stands of small trees that have a high crown base, but in reality since these are so thick, the potential for wind driven crown fire is high.

- Would the continuity of crown bulk density and crown base height help to address the model glitch?

Treatment Area 4

- The areas southwest of Flagstaff have a high interspersion of state lands, are you working with the State about treating these areas? Typically we can work with the state so that if they know we will be treating in adjacent areas, they will work on these. This is based on funding.

Treatment Area 5

- West Fork is in this area (not 4).
- Wasn't there disagreement about treatment in West Fork?
- There are roads above the canyon on both sides which would allow treatment of both sides of the canyon. No treatment within the canyon.
- Reassess the Kachina and Woody treatments to see if they meet the DC?

Firescape 4 Treatment Area 1

- I suggest you do additional meetings in the Williams and Tusayan areas to get more participation.

Treatment Area 2

- If we could display the amount of area being dropped out of treatment for the various reasons, this will help people with a concern about the entire project area being mechanically treated.

Treatment Area 3

- No comments

Treatment Area 4

- This is an important groundwater recharge area, and given that this has an open treatment type, I am interested in seeing treatments designed to help retain snow packs.
- Pumping from the Woody Mountain wells could affect Oak Creek, if you could increase the groundwater recharge in this area, it would benefit other systems.

Treatment Area 5

- The A-1 Project area was not a restoration based project, so it needs to be reviewed.

Firescape 5 Treatment Area 1

- City of Flagstaff will be sending a comment about Rio de Flag.

- There is an opportunity to collaborate with the City because they have a stormwater monitoring program and a network of gauging stations that could be used for monitoring.
- Area north of MNA is a wildlife corridor, and I think there is a way to accommodate both treatment and wildlife. Need carefully designed treatments.

Treatment Area 2

- The Schulz fire area has been pulled out since this will be responding to fire and flood issues.

Firescape 6 Treatment Area 1

- Clarify with Bruce regarding too much past/on-going treatment.
- Cross walk the area with past fire management may indicate that fire only could be used in these areas.

Treatment Area 2

- Could you show the density of heritage sites? Will there be issues? When we do survey in areas proposed for burning, we do survey for specific items such as wood structures or similar. The maps displayed are the finals with just high and low site density.

Treatment Area 3

- The sagebrush-pipo areas may need different treatments that would be similar to the treatments in savannah grassland, except the grass is sage. Want to ensure the sagebrush would not get overtopped and choked out. Mature trees are a good indication of stocking and historic conditions.
- In a field trip on the Tusayan RD with Richard Reynolds, it showed that fire often stopped before burning up the sage. We would want to use an approach to retain the sage versus getting rid of it. (Bill's comment)

Treatment Area 4

No comments

General

- The scoping report will look different when it is posted on the web and distributed. We do hope to receive your comments in the traditional NEPA process. The Kaibab NF website and links from the Coconino NF are the websites where the documents will be posted.
- There is a huge amount of GIS information being conveyed. It would be helpful on the stakeholder side to review. Can we get the GIS data? Yes, we can provide the info; the metadata has not been developed for this.
- The wildlife data is sensitive, I don't want this distributed.

- Probably most important are the treatment and fire layers (crown, surface intensity), we'd prefer the raw data now versus the refined data. We recognize that the data is not final and will be shifting.
- Jill R – it is important to provide this as a package with the date provided.
- Monitoring – the PA does not address it, where does this get inserted? The PA does not include a complete monitoring plan, the DEIS would need to have these.
- Is the FS planning to do different monitoring than in the past? We haven't heard specifics about science or research areas. I would like to see a commitment from the FS for monitoring and changing the status quo, it is included in the proposal. I think the stakeholders are committed to monitoring and are seeking funding.
- We are hoping the science and monitoring will bring a plan forward. We recently had a monitoring workshop to help start the process, but we haven't heard about a monitoring plan.
- The stakeholders are committed to bringing a monitoring plan that identifies the components.
- Is VSS 1 considered as an opening? The range of openings indicated does not include VSS 1.
- How does this conform with the forest plans? In terms of canopy cover, applies to VSS 4-6.
- VSS 1 is part of a forested condition. I am talking about a non-forested opening.
- How are you defining your regeneration openings?
- We are talking about non-forested openings and forested groups. When a VSS 1 group is established it is intended to be forested.
- How is canopy cover calculated? We have talked about VSS and canopy cover. For this analysis, we are going address the canopy cover issue at mid and large scale. We will address 40% cover within VSS 4, 5, 6. We would use xxx images at mid and large scale. At stand and site we would manage for 40% cover. We would use BA as a proxy for canopy cover.
- Will you use those data to apply the 40-50% minimum requirement in VSS 4, 5, 6 at the stand or larger scale? Will it be a binary measure at those scales of canopy versus non-canopy, versus first pulling out the openings? This does not represent canopy cover. This is a problem of forest plan compliance and wildlife species. Our job is disclose the process used and to consider opposing viewpoints. This has been a drop dead issue for Sierra Club for 25 years. This is why we are focusing on DC. We need pictures to show this.

- Provide a glossary of terms so that there is a clear definition being used. Make sure you are speaking about the same things.
- This is a process question, do we understand the magnitude between the outcomes for any particular area. Unless we know the landscape area that is represented by groups, how do we understand the magnitude of difference? It could be radically different.
- One measure could be 50% is openings. If we called it 50% residual canopy cover, then this would be 25% canopy cover by my definition.
- Can we define an approach that would describe the openings? We want to see proportions of groups.
- How should we describe this? I think there is some agreement about what restoration is? I think we understand the measurement. We would have to have plan amendments, etc.
- I am talking about the science that describes the requirements, the forest plans, etc. These are required for the viability of the species.
- To me it is more important to know where the trees are on the ground.
- When you look at the literature, you have to remember that silviculture evolved with even-aged mgt. In the SW it is different where you need the rooting space to support groups and clumps. On the W/L side, I have never seen one standard, there is no consistent measurement used. I don't think that what is proposed is different than any of those measures.
- Can the FS provide a glossary of terms with specific definitions? I would like to ask the FS to provide a description of the methodology that bridges the agreement in the field and the disagreement in the conference room. We need to resolve this.
- How can we understand the magnitude the difference between these methods and understand it in a timely fashion? Is there an opportunity or way to proceed with planning so that we know what we are commenting on and not agreeing to? Can you point out some scenarios and show this specific to canopy cover and how to meet goshawk guidelines? We need more information on this.
- You could simulate this for pre and post treatment with the different methodologies and get an idea of what it would look like on the ground (Steve S). Could Forest ERA do this rapidly? For a specific area?
- Can you clarify the approach that you are recommending for canopy cover? Doesn't the MSO recovery plan require canopy cover at the stand level?
- Can you provide additional explanation of the thinning prescriptions being proposed? We know the area left in opening, but we know very little about the forested areas. Is the space left in groups? We need to understand the attributes of the residual forest, and describe this collaboratively.

- Are you looking for the desired post treatment conditions?
- I think you will have to look at images so that you understand the anticipated outcome. We don't want surprises about what will be left behind. It is critical to monitoring, so that I know I am measuring the right thing so that the silvicultural treatments are producing the same as what I define for monitoring.
- Can you provide the definitions, metrics and so on for the effects analysis?
- Point person is Taylor McKinnon who will send out an email about the discussion regarding canopy cover.
- Matt will get with Mark Nigrelli regarding GIS.

Additional Notes Taken at Meeting

Q: Will opening be included when calculating canopy cover, at what scale?

Q: How are openings calculated between stands? Will the approach be detailed for the public?

Q: Will maps come out with wildlife filters? Per treatment zone or single filter?

Q: Will next map show likely treatment areas? Will treat- might treat – will not treat

Recommendation: Clarify strategic placement of filters, esp. wildlife

Recommendation: Analyze all areas – regardless of priority

Recommendation: Look at entire KV line across the TAs

Q: What approach is being used in transition zones?

Q: Will intermediate thinning and SI be used?

Q: Would fire be used in wildlife areas?

Q: Is post tornado plan included in Firescape 3, Treatment Area 2?

Recommendation: Monitor effects of treatment on water yield

Recommendation: Sycamore Primitive Study Areas – area to study water yield

Q: Do we have true heterogeneity as a result of treatments in 3-2 and 3-3?

Recommendation: Update fire model assumptions/validate

Q: Is the State cooperating on State lands? If so, how?

Recommendation: Oak Creek – West Fork – in TA 3-5 – consider treatments for fire – use existing roads

Recommendation: Re-assess Kachina/Mountaineer compatibility and results

Recommendation: Repeat public meeting in Williams for FS 4

Recommendation: Consider ground water recharge in tree selection – affects Woody Mountain Area water supply

Recommendation: Carefully design for wildlife corridors at water museum

Recommendation: In Firescape 6-1, assess results of past activities to determine need for fire treatment

Recommendation: Protect asset values in 6-1

Q: What is the arch density in 6-2?

Q: Website means where? Kaibab

Recommendation: Put links to related sites

Recommendation: Make data (GIS) available to non-FS entities – fire, treatment layers (label and date as draft)

Q: When does effectiveness monitoring appear in analysis?

Q: How will monitoring methods differ from past FS methods and designs?

Recommendation: Make overt FS commitment to monitoring (cost sharing with others)

Q: Will an outline precede the final monitoring plan?

Q: Is VSS 1 considered a group or opening?

Q: If VSS 1 is included it should be included in calculating canopy cover

Q: Will BA be used at stand scale for CC%?

Q: Are stands stratified first?

Q: WHR should be used for canopy cover

Recommendation: Clearly outline methodology used to calculate canopy cover

Recommendation: Develop pictures of DFC

Recommendation: Explain any departure from forest plan'

Recommendation: Clarify difference between tree cover vs. canopy cover

Recommendation: Include methods in a glossary

Q: How do we know the potential magnitude of outcome difference with different descriptions?

Q: Use AM and monitoring to assess differences

Recommendation: Develop methodology to reach agreement on canopy cover

Q: Is there a way to proceed with planning with differences noted/tested? Develop scenarios to test/model differences to be able to understand magnitude – test groups, within groups, by stand, etc.

Q: Is a different RX method being used in MSO habitat?

Q: Additional descriptions of thinning and details available? Details of remaining areas in TAs?

April 27, 2011 Coconino and Kaibab Restoration EIS Public Meeting Mormon Lake District, Flagstaff, AZ, 12:30 p.m. – 4:30 p.m.

- Silvicultural Presentation – Questions, Responses, Comments and Action Items
- What is the definition of a stand – 5 acres up to 1,000 acres within this analysis
- Desired Conditions – not applied at the stand level – desired conditions came from forest plan language – existing (current) plans and working drafts for both forests

Comment: Proposed Action/analysis should describe/display what UEA, SI and IT look like pre and post-treatment

Comment: New treatment that has been added to address existing and desired conditions for Tusayan district is a pine/sage treatment

Comment: Still unclear how SDI is not just a silvicultural measure – not sure how it really can relate to evaluating ecologically-based restoration

Comment: Still unclear what is meant by Site Class and Site Index and how it relates to evaluating restoration

Comment on using NAIP to identify pre-settlement trees: Using 1930 images is not accurate (right date) as many trees had been cut by 1900. Neil responded that he used 1937 aerial photos and compared to today (2010) to see the change in young trees (post settlement trees) – next step that was completed was to put in plots to validate the aerial images – adjustments to the proposed action was made by doing a visual stand by stand assessment.

Comment: With the treatment matrix as presented, if it is non-forested and the desired condition is 40% - 60% would be forested? Response: Areas not in openings would be in tree groups.

Canopy cover would not be measured in within the openings (have to have a tree to calculate basal area) – Look at BA/Acre –look at PFA – gives you a percent of what's open and what is closed by prescription or BA/Acre

Question: How would a group be planned (during implementation)? Response: FS would determine what the existing conditions is and determine if there was a need for change by considering: (1) Are groups in existence or overly-abundant (i.e. no need for change)? (2) Are there existing openings to build from? (3) Use evidence (read the land) to determine if area under review had groups historically

Clarification Question: The matrix shows 70BA/acre – does it include openings and interspaces?

Response: Yes and this means the tree group BA would be higher than the BA averaged over the acre.

Question: Have stand-replacing fires resulted in over-representing trees that have to cut to move towards HRV? **Answer:** No – because soil is the record. Using soils (mollisol and mollic integrades) – can have some assuredness on what was historically a grassland – Soil is a record – using the last 100 years is a very brief record – soils can take a millennia to develop – they don't develop overnight

Comment: East side of Kendrick was once forested and is now grass and savannah from stand replacing fire – Proposed Action needs to account for those acres that were once forested habitat that are now functioning as a grassland/savannah; **Response:** TES unit mapped @ 1:24 with each stand being 60 acres. Just because the forest lost trees does not equate to it functioning as a grassland. Seems to be a dilemma of wanted the FS to manage historic grasslands as forested. Should forested be managed as a grassland?

Action Item: (1) How many acres have been converted to savannah and grassland due to fire? (1) Total acres converted to savannah and grass, (2) Total acres of mollisol and mollic integrate soils that correspond to these “fire acres” (3) Total acres of proposed savannah and grassland

Question: What is the temporal scale of the project? What is short and long term? 10 years? 20 years? 40 years? Treatment effectiveness in temporal terms needs to be analyzed. **Action Item:** IDT needs to finalize assumptions on temporal scale for effects analysis

Fuels/Fire Presentation – Mary Lata

Question: Will mortality projections be based on initial thinning and burning and maintenance treatments? **Response:** Yes. But we have many control mechanisms to reduce mortality potential – we can control when we burn based on temperature, soil moisture – factors that can cause/reduce the potential for mortality

Question: What does priority mean? Where we go first temporally? **Response:** Yes, but it does not preclude treating other areas as well.

Comment – How about analyzing one alternative with Priority One areas and other alternative that addresses Priority 2 areas.

Comment – Sarah R – AZGFD – Bar M watershed looked very homogenous in the first PA. When PACS, restricted, target threshold and corridor information was added – drastically changed to being heterogeneous

Question: What does safely restore natural fire regimes mean? **Response:** Address high priorities first –cannot afford to wait 30 years.

Comment/Action Item: – (1) Don't agree with the soils information used to develop savannah and grassland treatments – need to have a meeting that solely addresses this topic, (2) Issues with canopy cover and need to discuss NAU Master's Thesis on goshawk – set up a meeting for this

Action Item: How many primary and secondary acres are included?

Comment – Please provide/share this data. Response: We will provide as soon as it's refined (prior to PA being released as final)

Consolidated: Action Items:

(1) How many acres have been converted to savannah and grassland due to fire?

(2) Total acres converted to savannah and grass,

(3) Total acres of mollisol and mollic integrate soils that correspond to these “fire acres”

(4) Total acres of proposed savannah and grassland,

(5) Question: What is the temporal scale of the project? What is short and long term? 10 years? 20 years? 40 years? Treatment effectiveness in temporal terms needs to be analyzed. Action Item: IDT needs to finalize assumptions on temporal scale for effects analysis

(6) Action Item: How many primary and secondary acres are included?

(7) Comment/Action Item: – (1) Don't agree with the soils information used to develop savannah and grassland treatments – need to have a meeting that solely addresses this topic, (2) Issues with canopy cover and need to discuss NAU Master's Thesis on goshawk – set up a meeting for this