Appendix I - Summary of Response to Comments on the DEIS

All comments received on the draft EIS from Federal, State and local agencies have been included in this appendix on pages 925 to 994. This satisfies Section 102 (c) of NEPA which states, "…comments and views of the appropriate Federal, State and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public…"

Although the project only directly affects Coconino County, comments from the Eastern Arizona Counties Organization has been included to reflect similar comments received from Apache, Gila, Graham, Greenlee and Navajo County.

Per 40 CFR 1503.4, summarized responses to comments received on the draft EIS are included in this appendix. They have been organized by topic. All comments received on the draft EIS are available for public review at: https://cara.ecosystem-management.org/Public/Letter/172405?project=34857. All comments received were reviewed and responded to individually. The complete comment analysis and response document is located in the project record and is available on the project's website at: http://www.fs.usda.gov/main/4fri/planning.

List of Commenters

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American Indian Govt. Agency /Elected Official		
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County Government Agency /Elected Official		
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Federal Agency/Elected Official		
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Environmental Protection Agency, Region IX	Martyn Goforth, Kathleen	71
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The Hopi Tribe

April 9, 2013

Michael R. Williams, Forest Supervisor Kaibab National Forest
800 South Sixth Street Williams,
Arizona 86046-2899

M. Earl Stewart, Forest Supervisor Coconino National Forest
1824 South Thompson Street Flagstaff,
Arizona 86001-2529

Re: Four Forest Restoration Initiative-Coconino and Kaibab National Forests Draft Environmental Impact Statement

Dear Supervisors Williams and Stewart,

This letter is in response to the Draft Environmental Impact Statement for the Four Forest Initiative, Coconino and Kaibab National Forests regarding a proposal to conduct restoration activities within a 587,923 acres ponderosa pine ecosystem over 10 years_ The Hopi Tribe claims cultural affiliation to prehistoric cultural groups in Coconino, Kaibab, Apache Sitgreaves and Tonto National Forests. The Hopi Cultural Preservation Office supports the identification and avoidance of prehistoric archaeological sites and we consider the prehistoric archaeological sites of our ancestors 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.

In the enclosed letter dated March 21, 2011, the Hopi Cultural Preservation Office reviewed the Four Forest Restoration Initiative-Coconino and Kaibab National Forest Purpose and Need and Proposed Action. We stated in initial consultations we have been info1med 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.

In the enclosed letter dated June 6, 2011 we reviewed the Heritage Resources Strategy and NEPA Compliance for the Four Forest Restoration Initiative. The Strategy states that 46% of the 530,187 acre project area in the Kaibab National Forest has been surveyed for cultural resources and 3,843 cultural resources have been identified, and 40% of the 817,151 acre project area in the Coconino National Forest has been surveyed and 3,366 cultural resources have been identified.

The Strategy also states that Kaibab and Coconino National Forests have approached their methods of inventory in the ponderosa environments very differently, with the Kaibab conducting 100% survey and the Coconino conducting l 00% survey in high site density areas, but only sample surveys of around 15-25% in low density areas. We understand that this multiple forest survey strategy generally adopts the Appendix J and Coconino approach, and that this strategy is intended to result in a determination of no adverse effect to historic properties.

In our June 6, 2011, letter we asked why the Forests don't adopt the approach Kaibab has employed since the 1970s, rather than the less rigorous Appendix J and Coconino approach to provide consistency in the way compliance is conducted. The Forest Service has acknowledged that the need to improve the health and condition of the forests has resulted from the fire suppression mismanagement of the forests over the last Century. Ifit has been possible for the Kaibab to conduct I 00% surveys for over forty years.is that approach now being diluted because of the sheer size of this proposal?

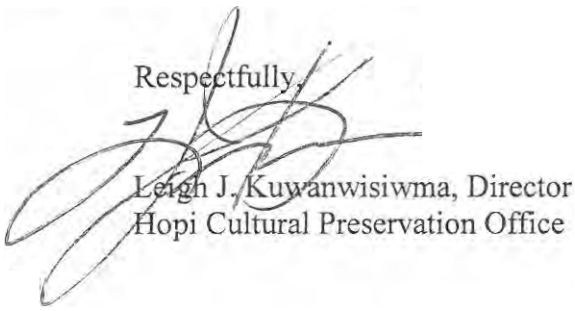
We have also consulted on this proposal at our regular administrative meetings and have stated we looked forward to continuing consultations with the four Forests on the development and implementation of the cultural resources survey plans, and Traditional Cultural Properties and ethnographic studies.

We have now reviewed the Draft Environm ental Impact Statement, and understand Alternative C the Preferred Alternative responds to the issues of conservation of large trees and increased restoration and research. Our March 21, 2011 letter is not cited on page 35, Tribal Consultation . We also understand that in addition to Appendix J, a heritage strategy, initial Section 106 report, and tribal relations analysis have been developed for the project, and that effects on cultural resources from the action alternatives are not considered to be adverse .

However, regardless of whether additional high impact or intense mechanical treatments occur under the preferred alternative, we look forward to continuing consultation on this project including the review of cultural resources survey reports, mitigation of adverse effects, identification and protection of Traditional Cultural Properties, and in the event of any inadvertent discoveries .

Regarding Forest Plan Amendment 3: Effect Determination for Cultural Resources, we understand this is a specific, one-time variance for the Coconino National Forest deletes the standard that addresses achieving a "no effect" determination and adds the words "or no adverse effect"to the remaining standard. More importantly than "no effect" or "no adverse effect" determinations, as demonstrated by both current and potential litigation in the Southwest and across the Country, the Forest Service has yet to integrate its Native American Sacred Sites and Traditional Cultural Properties consultations into its management decisions.

Nevertheless, we also look forward to continuing consultation with the Forest Service in the hope that in the future, these consultations will lead to the integration of the content of tribal consultations into the Forest Service's management decisions. Ifyou have any questions or need additional information, please contact Terry Margart at the Hopi Cultural Preservation Office at 928-734-3619 or tmon:rnrt@hopi.nsn .us. Thank you for your consideration .



Enclosure : March 21 and June 6, 2011 letters

xc: Arizona State Historic Preservation Office Henry Provencio, Coconino National Forest Mike Lyndon, Kaibab National Forest Craig Johnson , Coconino National forest Chris Knopp, Apache-Sitgreaves National Forest Neil Bosw01th, Tonto National Forest

The Hopi Tribe Attachment 1

June 6, 2011

M. Earl Stewart, Forest Supervisor

Attention: Craig Johnson, Tribal Relations Specialist Coconino National Forest

1824 South Thompson Street Flagstaff, Arizona 86001-2529

Re: Four Forest Restoration Initiative -Coconino and Kaibab National Forests Heritage Resources Srrategy and NEPA Compliance

Dear Supervisor Stewaii,

This letter is in response to your correspondence dated May 12, 2011, regarding an enclosed Heritage Resources Strategy and NEPA Compliance for rhe Four Forest Restoration Initiative, a proposal to conduct restoration activities within a 750,000 acres ponderosa pine ecosystem over 10 years. The Hopi Tribe claims cultural affiliation to the Archaic, Sinagua, and Cohonina prehistoric cultural groups in the Coconino and Kaibab National Forests. The Hopi Cultural Preservation Office supports the identification and avoidance of prehistoric archaeological sites and we consider the prehistoric archaeological sites of our ancestors to be "footprints" and Traditional Cultural Prope1iies. Therefore, we appreciate the Forests' continuing solicitation of our input an your efforts to address our concerns.

The Hopi Cultural Preservation Office has reviewed the enclosed Four Forest Restoration Initiative - Heritage Resources Strategy and NEPA Compliance. Inour letter on this proposal dated March 21, 2011, we stated that in initial consultations on the Four Forest Restoration Initiative 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 Am.ended Programmatic Agreement Regarding Historic Property Protection and Responsibilities will apply to these projects.

The Strategy states that 46% of the 530,187 acre project area in the Kaibab Nationa l Forest has been surveyed for cultural resomces and 3,843 cultural resources have been identified, and 40% of the 817, 151 acre project area in the Coconino National Forest has been surveyed and 3,366 cultural resources have been identified.

The Strategy also states that Kaibab and Coconino National Forests have approached their methods of inventory in the ponderosa environments very differently, with the Kaibab conducting 100% survey and the Coconino conducting I 00% survey in high site density areas, but only sample surveys of around 15-25% in low density areas. We understand that this multiple forest survey strategy generally adopts the Appendix J and Coconino approach, and that this strategy is intended to result in a determination of no adverse effect to historic properties.

To provide consistency in the way compliance is conducted, why don't the Forests adopt the approach Kaibab has employed since the 1970s, rather than the less rigorous Appendix J and Coconino approach? The Forest Service has acknowledged that the need to improve the health and condition of the forests has resulted from the fire suppression mismanagement of the forests over the last Century. Ifit has been possible for the Kaibab to conduct 100% surveys for over forty years, is that approach now being diluted because of the sheer size of this proposal?

We look fornrard to continuing consultations with the Forests on the implementation and review of the cultural resources surveys, as well as Traditional Cultural Properties and ethnographic studies. Ifyou have

any questions or need additional information, please contact Terry Margart at the Hopi Cultural Preservation Office at 928-734-3619 or tmonrnrt@.hooi.nsn.us. Thank you for your consideration.

Leigh J. Kuwanwishma, Director Hopi Cultural Preservation Office

Enclosure: March 21, 2011, letter to Kaibab and Coconino National Forests

xc: Michael R. Williams, Michael Lyndon, Kaibab National Forest Arizona State Historic Preservation Office

The Hopi Tribe Attachment 2

March 21, 2011

Michael R. Williams, Forest Supervisor Kaibab National Forest
800 South Sixth Street
Williams, Arizona 86046-2899

M. Earl Stewart, Forest Supervisor Cocon ino National Forest
I 824 South Thompson Street
Flagstaff, Arizona 86001-2529

R.e: Four Forest Restoration lnitiarive-Coconino and Kaibab National Foresr Purpose and Need and Proposed Action

Dear Supervisors Williams and Stewart,

This letter is in response to your correspondence dated January 27, 2011, regarding an enclosed proposal to conduct restoration activities within a 750,000 acres ponderosa pine ecosystem over J O years, part of the Four Forest Restoration Initiative. The Hopi Tribe claims cultural affiliation to prehistoric cultural groups in Coconino, Kaibab, Apache Sitgreaves and Tonto National Forests. The Hopi Cultural Preservation Office supports the identification and avoidance of prehistoric archaeological sites and we consider the prehistoric archaeological sites of our ancestors to be "footprints" and Traditional Cultural Properties. Therefore, we appreciate the Forest's continuin'g solkitation of our input and your efforts to address our concerns.

The Hopi Cultural Preservation Office has reviewed the enclosed Four Forest Restoration lnitiative-Coconino and Kaibab National Forest Purpose and Need and Proposed Action. We routinely consult with Coconino, Kaibab, and Apache-Sitgreaves Forest Managers and Archaeologists during regular scheduled meetings on the Forests' Schedule of Proposed Actions. In initial consultations on the Four Forest Restorat ion Initiative we have been infonned that Appendix J. Standard Consultation Protocol for Large-Scale Fuels Reduction, Vegetation Treatment, and Habitat Improvemen t Projects pursuant to the First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities will apply to these projects.

Therefore, we look forward to continuing consultations with the four Forests on the development and implementation of the cultural resources survey plans, and Traditional Cultural Properties and ethnographic studies. If you have any questions or need additional infonnation, please contact Teny Margart at the Hopi Cultural Preservation Office at 928-734-3619 or tmorait@.hopi.nsn.us. Thank you for your consideration.

Hopi Cultural Preservation Office

cc: Forest Supervisor, Attention: Scott Wood, Tonro National Forest

Forest Supervisor, Attention: Melissa Schroeder, Apache Sitgrcaves National Fo;csts Arizona State Historic Preservation Office

Mike Lyndon, Erin Woodard, Kaibab National Forest Craig Johnson, Coconino National Forest

Flagstaff Fire Department

3 May 2013

Earl Stewart Forest Supervisor
Coconino National Forest -4FRI 1824 S. Thompson St
Flagstaff AZ 86001

SUBJECT: Draft Environmental Impact Statement (DEIS) Four Forests Restoration Initiative

Supervisor Stewart:

On behalf of the City of Flagstaff Fire Dept, we appreciate the huge amount of work that has gone into development of this document, and the opportunity provided to comment. This is truly a historic approach to the pressing need to protect and ensure the long-term sustainability of our forests (and communities) in the greater Flagstaff and northern AZ area. Congratulations are in order for all those who have worked so long and hard to get us to this point.

The four key issues captured on p. iv of the Summary -Prescribed Fire Emissions , Conservation of Large Trees, Post-treatment Canopy Cover and Landscape Openness, and Increased Restoration and Research - seem to adequately describe key issues. Specifically in regards to these issues:

Prescribed Fire Emissions -Emissions from any wildland fire are of concern, but we recognize that emissions produced under prescribed fire conditions are more tolerable, of shorter duration, and far less impactful than that produced by large-scale, destructive wildfire events. We cannot prevent smoke -our forests will burn, and the trend over the past decade or more is toward more severe wildfires. Nor can we afford to overlook the fact that prescribed fire, where we manage both conditions and results, is required for ecosystem health and one of the most cost-effective and proactive tools we have to prevent and/or reduce the catastrophic wildfire (s) in our near future. We applaud the Forest Service for recognizing the challenges of managing fire, but including this treatment in the DEIS.

Conservation of Large Trees - The Large Tree Retention Strategy (LTRS) was developed by various stakeholders over an extended period of time. Although excluded from the August 2011 Proposed Action, it's inclusion in the DEIS is certainly a good-faith effort by the Agency to honor the work of those who labored over its creation and adoption: undoubtedly , there will be comments provided by others in regards to the Strategy incorporation and use, and we encourage the Agency to further incorporate those issues where appropriate and possible.

Post-treatment Canopy Cover and Landscape Openness - We recognize the historical "open forest", and welcome a return to that condition where appropriate and to the extent possible. Such a condition reduces the threat of severe-and-damaging wildfire, and improves resilience to climate change and insect outbreaks. Improvements of understory bio-diversity • and water recharge/yield are also positive aspects of this condition. But we also recognize that for many, too much "openness" can be an issue that moves them away from support of the project, rather than toward it. Recognition of this social reality , and taking steps to address it so it does not become a divisive issue, are marks of an attentive and responsive Agency and we urge you to continue to seek common-ground and understanding.

Increased Restoration and Research: This effort certainly provides unique and valuable opportunities to adaptively manage both treatments and effects, in their broadest possible context (technology, social, ecosystem, etc). Incorporation of new material , such as the MSO Recovery Plan -2012, is an excellent approach. We should not be afraid of seeking out and using such information, for after all, we know very

well the inevitable results of inaction, slow implementation , outdated processes, and the short shelf-life of "state-of-the-art " methodology.

Another issue sure to draw attention is that of Cumulative Effects, especially over such a large landscape and abutting other completed , on-going, or to-be-planned projects. In this regard, I only a different viewpoint: that the cumulative effects of non-action , or action undertaken on the current small-scale model is unsustainable , and that we can no longer stand-by or only nibble at- the-edges while our forests, environment, and our communities are being devastated. Thinking BIG is not easy, and the Agency, and all collaborating entities, is to be congratulated for doing so.

Three particular items drew our attention that if revised would more accurately reflect current reality :

l) Table 150 (p. 686) -City of Flagstaff efforts are not included (they are separate from, and not necessarily reflected by, the Greater Flagstaff Forests Partnership) ;

2) Table 156 (p. 694) -City of Flagstaff projects and acres are not listed, and, as above, are not necessarily included in or reflected by projects and acres attributed to the Greater Flagstaff Forests Partnership; and

3) Acres identified for the Flagstaff Watershed Protection Project -FWPP - (p. 697) is inaccurate (we recognize that at the time the document was created, what is shown was a rough idea, but the acreage of the FWPP has since been firmly identified).

In closing, we concur with selection of Alternative C as the Preferred Alternative. It treats the most acreage, has the longest positive effect over time, responds to key issues, and incorporates a number of innovative features and approaches. Others will likely provide recommendations or other options to critical items and issues that will warrant evaluation for inclusion in the final EIS. But, we are satisfied with the plan as it now stands, knowing full well that our communities, forests, and all of the northern AZ area is dependent upon this project moving forward.

We look forward to the Record of. Decision (ROD), our continued joint collaboration, treatment implementation , and the opportunity to collectively learn and make a difference in our community and area. Thanks for your leadership, and your eagerness to partner with others, in this effort!

yours for a better tomorrow . . . .

Paul Summerfelt

Wildland Fire Management Officer psummerfel t@flagstaffaz.gov

CC: Flagstaff City Council and Leadership Team

U.S. Environmental Protection Agency

United States Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA 94105

May 16, 2013

Mr. Henry Provencio 4FRI Team Leader
1824 South Thompson Street Flagstaff, Arizona 86001

Subject: Draft Environmental Impact Statement for the Four-Forest Restoration Initiative, Coconino County, Arizona (CEQ# 20130076)

Dear Mr. Provencio:

The U.S. Environmental Protection Agency has reviewed the Draft Environmental Impact Statement for the Four-Forest Restoration Initiative pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

The EPA recognizes the Forest Service's commitment, demonstrated in the Four-Forest Restoration Initiative (4FRI or Project) DEIS, to restoration activities within the Coconino and Kaibab National Forests. We also acknowledge the Forest Service's dedication to public outreach and collaboration during the 4FRI NEPA process, and the efforts made to incorporate the best available science into the DEIS. In particular, we appreciate the 4FRI team talcing Jason Gerdes, of my staff, on a site visit of the 4FRI planning area, and working with Jason and EPA Region VIII's Richard Graham to include information in-the-DEIS-on the potential for smoke-fr.om-the -prnposed-pr-escribed fir-e tr-eatments to contain radioactive substances.

Based on our review of the subject DEIS, we have rated the Preferred Alternative and the docwnent as L0-1,Lack of Objections -Adequate (see enclosed EPA Rating Definition'\). The EPA acknowledges the need for the use of mechanical thinning and prescribed fire to achieve long-term restoration objectives. We commend the Forest Service for committing, in the Preferred Alternative, to strong best management practices and soil and water conservation practices to protect sensitive resources during mechanical harvest and fire treatments.

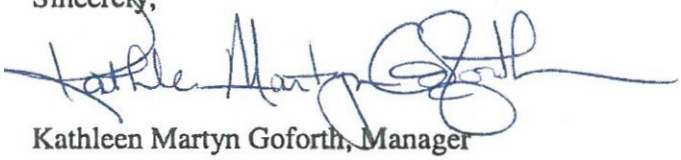
We recognize the challenge the Forest Service faces in implementing a restoration project that will rely heavily on prescribed bums and wildfire to achieve Project objectives. The "Fire Ecology Report" that the Forest Service prepared for this Project explains these challenges well. Although the planning area has good air quality and meets all federal ambient air quality standards, the fine particulate matter generated during wildland fire does present a hwnan health risk. We recommend that the Forest Service work with the interagency Smoke Management Group and commit, in the Final EIS and Record of Decision, to implement best management practices to reduce emissions from prescribed burns and wildfires to the greatest possible extent. We also recommend that the Forest Service analyze and include a description, in the FEIS, of the potential for further reductions in air emissions from future forest treatments by lessening or eliminating pile burning of residual fuels in favor of biomass energy production.

The DEIS includes a detailed and thorough description of the possible effects of climate change on the Project, and is strengthened by incorporating elements of two good planning documents: the "Kaibab

National Forest's Climate Change Approach for Plan Revision," and the "Southwestern Region Climate Change Trends and Forest Planning."We recommend that the Project's adaptive management plan include a commitment to monitor, mitigate, and respond to, the effects of climate change throughout the life of the 4FRI.

We appreciate the opportunity to review this DEIS, and are available to discuss our comments. When the Final EIS is released, please send one CD copy to this office. Ifyou have any questions, please contact me at 415-972-3521, or contact Jason, the lead reviewer for this project. Jason can be reached at 415-947-4221or gerdes.jason@epa.gov .

Sincerely,



Kathleen Martyn Goforth, Manager
Environmental Review Office

Enclosure: Summary of the EPA Rating System

Summary of EPA Ratings Definitions

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's(EPA) level of concern with aproposed action. Theratings area combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

Environmental Impact of the Action

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation .measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation 11:1casures that can reduce the environmental impact. BPA would like to work with the lead agency to reduce these impacts.

"EO"(Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU"(Environmentally Unsatisfactory)

The BPA review has identified adverse environmental impacts that arc of sufficient magnitude that they an: unsatisfactory from the standpoint of public health orwelfare orenvironmental quality.EPA intends to work with the lead agency toreduce these impacts. Ifthe potentially unsatisfactory impacts an: not corrected at the finaJ EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying Janguage or infonnation.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data., analyses, or discussion should be included in the final EIS.

"Category 3"(Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

•From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment

USDI National Park Service

United States Department of the Interior
NATIONAL PARK SERVICE
INTERMOUNTAIN REGION
12795 West Alameda Parkway
PO Box 25287
Denver, Colorado 80225-0287

IN REPLY REFER TO:
ER-13/0194

VIA ELECTRONIC COPY ONLY - NO HARD COPY TO FOLLOW

Memorandum

To: Cheryl Eckhardt, National Park Service

From: Vanessa Sanchez, U.S. Fish and Wildlife Service

Subject: National Park Service Comments on ER-13/0194, Draft Environmental Impact Statement, Four-Forest Restoration Initiative, Coconino and Kaibab Forests

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement (DEIS) for the Four Forest Restoration Initiative (4FRI). The proposed fire risk reduction and forest health restoration actions under the DEIS are in proximity to and have the potential to affect visitor experience, and cultural and natural resources within Walnut Canyon and Sunset Crater Volcano National Monuments. The Coconino National Forest is already implementing numerous smaller-scale projects covering much of the watersheds and viewsheds for the two national monuments, including the Mountainaire, Elk Park, Eastside, Jack Smith-Schultz, and Marshall wildfire risk reduction and forest health restoration projects. The 4FRI would address fire risk reduction and forest heath within the remaining watershed and view-shed areas.

Over the last eight years, resource management staff with the Flagstaff Area National Monuments have participated in the Coconino National Forest's collaborative planning process for these earlier projects. As a result, NPS concerns were addressed while planning the earlier projects, and are being carried forward into the landscape-scale 4FRI. The 4FRI action alternatives are also being collaboratively planned with the Greater Flagstaff Forest Partnership and other stakeholders, incorporate the best available ponderosa pine fire ecology science, and fully involve the U.S. Fish and Wildlife Service in the design and implementation of treatments in Mexican spotted owl habitat. The three action alternatives under the 4FRI DEIS are each well planned and will meet mutual NPS objectives for ponderosa pine forest restoration, wildfire risk reduction, wildlife habitat management, watershed function, and scenic quality retention within Walnut Canyon and Sunset Crater Volcano National Monuments.

The NPS fully supports the need to address existing conditions, along with implementing one of the three action alternatives under the Final Environmental Impact Statement.

Thank you very much for the opportunity to comment on this EIS. Please feel free to contact Paul Whitefield, Natural Resource Specialist, Flagstaff Area Monuments, (928) 526-1157 ext.235, with any questions.

cc: Tom Flanagan, NPS-WASO-EQD

Paul Whitefield, NPS-FLAG

The State of Arizona Game and Fish Department

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Mr. Henry Provencio
4FRI Team Leader
USDA Forest Service, Coconino National Forest
1824 S. Thompson St.
Flagstaff, AZ 86001

Re: Arizona Game and Fish Department Comments, Draft Environmental Impact Statement for the Four Forest Restoration Initiative

Dear Mr. Provencio,

The Department appreciated the opportunity to participate as a cooperating agency in preparation of the 4FRI DEIS, the largest forest restoration project yet undertaken in the western U.S. Our partnership will help ensure that 4 FRI yields the greatest possible benefits to Arizona wildlife and people who value those resources. The Department likewise appreciated the open, transparent, and collaborative approach taken by the Forest Service and incorporation of the recommended watershed and wildlife research efforts. We look forward to continued cooperation with USFS to make this landmark effort a success on the ground. Our general and specific comments on the DEIS follow.

General Comments -DEIS

The Old Tree and Modified Large Tree Implementation Plans address challenging social concerns, while providing a science-based framework for retaining ecologically-valuable old trees and providing flexibility needed to meet restoration objectives across a complex landscape. We encourage using similar approaches where appropriate, in future restoration efforts on other Arizona forests.

The Bridge Habitat section of the DEIS does much to address concerns expressed by some stakeholders about the degree of forest openness following treatment and potential effects on canopy-associated wildlife. It would be helpful if these spatial data could also be presented in a temporal context, i.e., illustrating progressive change at multi-year intervals over expected duration ofthe project. We understand that an analysis of this type may not feasible at project area scale; however an example at watershed or similar level would be informative.

The Department welcomes the focus on grassland restoration. Restoring encroached and degraded grasslands will have considerable benefits to pronghorn and other grassland-associated wildlife. In planning these treatments, it is important to ensure connectivity between extant grasslands and areas that will be restored. Please coordinate with our staff to help prioritize and coordinate these efforts.

Riparian, wetland, and spring habitats are uncommon on the project area and of tremendous importance to wildlife. The Department welcomes and supports active improvement and restoration of these areas. Please coordinate with our staff to help prioritize and coordinate these efforts.

Given the spatial extent and duration of the project, it would be helpful if fire and thinning treatments and their effects were analyzed with greater temporal resolution, i.e., more than just before/after snapshots. It

would also be helpful if the fire ecology section of the DEIS addressed the potential for large wildfires that could occur on the analysis area during implementation.

The Preferred Alternative includes decomissioning 770 miles of existing roads and 134 miles of unauthorized roads, previously identified through the Travel Management Rule (TMR) process. The Department previously provided comments on travel management for areas included in the 4FRI EIS. We remain committed to fulfilling our public trust responsibilities, preventing resource damage and ensuring that the public has adequate motorized access for wildlife-oriented and other recreational activities.

Treatments on much of the analysis area reflect a regulated forest, sustained yield paradigm, which appears somewhat at odds with the considerable volume of material on natural range of variability, disturbance regimes, and restoration practice cited in the DEIS. For example, the Department has previously expressed and continues to have uncertainty about the use of regeneration openings in the context of forest restoration. That said, we understand that they reflect current guidance in the Forest Plans. However, for future projects, we encourage including alternatives that are more oriented toward ecologically-based restoration.

The Adaptive Management component of the 4FRI project will be key to its success, but is incomplete in the DEIS. The Department recommends continued engagement with the 4FRI stakeholder group to complete this critical element.

The DEIS acknowledges that the preferred alternative will put the analysis area on a trajectory toward restoration but doesn't speak to "what next." When mechanical thinning is completed, will the landscape be maintained by natural and prescribed fire? Or will subsequent entries of mechanical thinning be needed? It would be helpful to give a sense of the long-term management strategy for the area.

Specific Comments -DEIS

1. (Ch1 :Table 3). Please indicate percent interspace ranges (Silvi Report p 33) for canopy openness categories.

2 (Ch1: p21). Please provide more detailed plant community description for "pine-sage" type.

3 (Appendix 3: p 707). Please add definition of "Mid-scale" at first mention, as done for Landscape Scale (p 699).

Specific Comments -Wildlife Specialist's Report

1. (Table 2, p 165). Fawning dates for deer are stated as May IS-August 31. Deer-fawning in the 4FRI area would be later, from July IS basically to Aug 31. Please modifY accordingly.

2 (Table 2, p 165). With respect to roosting habitat for turkey, clumps of older-aged trees along ridges and on slopes above drainages in forests above the transition zone are also important. Please modifY accordingly.

3 (Table 2, p 165). Prescribed, broadcast burning during the nesting season for turkey (April IS-June IS) could result in loss of eggs or poults. We understand this is outside the normal window for such treatments, but nonetheless recommend deferring prescribed broadcast burning during this period.

4 (Table 2, p 165). With respect to pronghorn, we would recommend avoiding mechanical thinning and hauling activities in or near known pronghorn fawning areas during times when fawns are still in the hiding phase (April IS-June IS).

Specific Comments -Fisheries Specialist's Report

1. The BMPs describe ways of reducing the impacts of prescribed burns and thinning activities to springs and to streams with sensitive species. These BMPs are designed to stay compliant with water quality standards of the clean water act. These BMPs are well thought out and are likely to accomplish their intended goal. However, this document recognizes the likely impact to some locations including those with sensitive aquatic species. Please consider monitoring ofwater quality or aquatic resources. This monitoring is necessary for understanding the impacts ofproposed activities to sensitive species within the project area. Monitoring is also necessary when determining if additional mitigation will be necessary for disturbed areas.

2 (p 40). It is implied that Western Mosquitofish is a Sportfish within the state of Arizona. It is not. Pleas remove the term sportfish and replace with fish.

3 (p 40). It is stated that Munds canyon would support native fish species if Odell Lake did not have non-native sport fish. This is speculation. Much of Munds canyon is dry during periods of drought and may not sustain any fish population during dry years.

4 (p 61, 63)The terms "natural state", "natural condition" and "unnatural condition" are used when describing effects of vegetation management and prescribed fire (example p 61 paragraph 3 and p 63 paragraph I) please define "natural" or delete the term and simply define the changes described within the altered or unaltered springs.

In summary, the 4FRl DEIS reflects a fundamental and welcome shift toward restoring natural function ofponderosa pine forests in Northern Arizona and bringing these areas closer to the historical range of natural variability. The Department is pleased to express its support for the Preferred Alternative and associated Forest Plan amendments.

Sincerely,

Craig McMullen Regional Supervisor

Arizona State Forestry Division

Office of the State Forester
1110 W. Washington Street, Suite 100
Phoenix, AZ 85007
(602) 771-1400

May 28, 2013

Earl Stewart Forest Supervisor
Coconino National Forest -4FRI
1824 S. Thompson Street
Flagstaff, AZ 86001.

Re: Arizona State Forestry comments, Draft Environmental Impact Statement for the Four Forest Restoration Initiative

Dear Mr. Stewart:

Arizona State Forestry is very pleased to submit comments on the Four Forest Restoration Initiative - Draft Environmental Impact Statement prepared by the Coconino, Kaibab, Apache-Sitgreaves, and Tonto National Forests. State Forestry would like to commend the size and scope ofthis project. The analysis of 988,674 acres with the potential treatment of 593,211 acres has the capability to make a significant difference in catastrophic wildfire loss, forest and watershed restoration, and rural economic development. The Draft Environmental Impact Statement (DEIS) document is the culmination of years of work begun in the Governor's Forest Health Council and continued in the Four Forest Restoration Initiative (4FRI) Collaborative.

This 4FRI project is an example of the collaborative and your staff working together to air the issues, followed by a negotiated zone of agreement, and ending with this huge volume of work. The effort and commitment of all the participants is impressive. We are very pleased to have been included and a partner in this process.

State Forestry is a charter member of the 4FRI Collaborative and was fully involved with the development of their submitted comments. We firmly believe that time is of the essence and that what can be done to expedite the NEPA process and begin treatments is of utmost importance.

The more time that passes before these acres are treated and the fire risk reduced, the more chance there is for catastrophic wildfire with the associated loss of more homes, loss of habitat, and extreme impacts to our watersheds.

We appreciate the opportunity to submit comments from our Agency. We wish to thank the USFS 4FRI team for all of their effort and cooperation in the development of the historic scale DEIS.

Issue 1: Economic Consideration

While the DEIS does contain a Socioeconomic Resource Report, we believe that not enough attention was paid to the real potential of income generation. The analysis recognizes a $100 million offset of treatment costs, but the value of the material removed seems overlooked. This is highlighted in a footnote on page

24 of the Socioeconomic Resource Report, which states that the "Chediski fire burned approximately 1 billion board feet of timber, valued at more than $300 million (Morton et al 2003)." While the details of these figures are not given in the DEIS, it is assumed that these figures represent values beyond stumpage.

This project is anticipated to produce "360,000 CCF of timber ...on an average annual basis throughout the 10-year treatment period," DEIS page 280. This is approximately 1.79 billion board feet of timber, that using the same numbers in the DEIS would generate approximately

$537 million. Even though the values in the study may be outdated, we believe the scale and term of this 4FRI project dictate a more thorough economic analysis of the potential timber revenue projections, not just offsetting costs of the federal government.

Restoration and hazardous fuel reduction are commendable goals that could easily be met while purposefully generating revenue to benefit the forests and citizens of the country. Projects of this size, with equal consideration given to economic benefit have the potential of revitalizing the payments in lieu of taxes fund, and could make much more revenue available for local schools and counties.

Issue 2: Prescribed Fire

One of the goals of this project is the restoration of natural fire regimes to fire-dependent landscapes and vegetation types. This is a goal that Arizona State Forestry supports. However, it must be done in a well thought out manner and cannot be done when and where conditions do not warrant.

The DEIS, page 40 states: "Two prescribed fires would be conducted on all acres proposed for treatment over the 10-year period." With this hard and fast proclamation, there is a concern that natural resource objectives, public safety, public health, and protection of private property could be compromised. We request that this statement be replaced with one that emphasizes an accelerated prescribed fire program with a goal of burning each proposed acre twice over a ten year period.

Issue 3: Large Tree Retention Strategy

State Forestry believes that the essence of stakeholder-produced Old Growth Protection and Large Tree Retention Strategy are included in the DEIS's Old Tree and Modified Large Tree Implementation Plan. The explanations for this decision given on Table 15, pages 60-61 DEIS show that the USFS incorporated the substance and intent of the stakeholder documents. USFS land managers need the flexibility provided in this strategy to make appropriate on-the-ground decisions across this diverse landscape.

Issue 4: Impact to Local Roads and Highways

The DEIS, page 302, states "The 4FRI project area encompasses the Arizona communities of Flagstaff, Mountainaire, Munds Park, Kachina Village, Mormon Lake, Doney Park, Parks, Williams, and Tusayan. Major access routes include Interstates 40 and 17, U.S. Highways 89, 180, and 66, State Route 64, County Road 73, and Lake Mary Road (Forest Highway 3)." This project is anticipated to significantly increase logging truck traffic on all these major access routes. A preliminary analysis done by Arizona State Forestry, Governor's Forest Health Council, Eastern Arizona Counties, and others, found that implementing 4FRI will result in approximately a $2 million increase in road maintenance for State, County, and municipal roads.

The Transportation Specialist's Report does not include any analysis of roads not located on the National Forests. We would like to request a more thorough analysis of the impact and cumulative impacts to the local infrastructure be completed and included in the Final EIS and Record of Decision. We offer to help with this analysis and to work with other State and local agencies.

Issue 5:Water Yield

In the DEIS pages 38-39 and 47, water yield is considered, but only as a potential research item. There is not any emphasis on actually designing treatments to capture snowfall and increase water flow. The effects analysis recognized that water yield from these forest "is likely reduced from historic conditions due to forest ingrowth and dense stand conditions" DEIS, page 102. On this same page, the analysis of alternatives recognizes "Water yield would be expected to increase only slightly in areas where vegetation treatments remove 25 to 50 percent of the overall tree canopy cover within a given watershed." There is not any focus on this issue nor is there text stating that this is an issue of concern. There is no recognition that within the present alternatives, implementation could be designed with the intent of increasing snowfall retention and water yield.

With Arizona's continued drought and significant water demands, this project should do what it can and where it can to consciously increase water yield. We request that the Forest Service recognize this is an important issue that deserves more consideration. In many places, where there are no substantial conflicts with other resource needs, the FS should consider increasing the width of openings to 1.5 to 2 times the tree heights with the intent of increasing snow pack; with the openings generally situated perpendicular to the slope. This should especially be considered on north facing slopes that receive less direct sunlight, thus allowing the snow pack to last longer and get deeper and produce more ground water. The Forest Service should work with experts in this field to design and implement other aspects of treatments that will increase water yield.

Increased snow pack will mean more soil moisture for the trees and shrubs, benefiting wildlife, and should lead to increased water yield. InArizona particularly, this should be something that the National Forests strive for, especially where these treatment designs would work well with the other resources of concern.

Issue 6: Cumulative Effects

Two employees of State Forestry met with the Forest Service 4FRI development team to examine the extent of site specific analysis and cumulative effects analysis that was done for this project. Given this, we do have concerns with the cumulative effects analysis. Trying to assess and determine if the cumulative effects analysis was thorough was extremely difficult. The DEIS contains Appendix F - Cumulative Effects, but this has only a portion of the actual cumulative effects in it. Much of the cumulative effects are presented in Chapter 3 - Affected Environment, and most of it is "incorporated by reference" in the specialist reports. In all these places, the cumulative effects were presented in a wide variety of formats. The degree of analysis also varied widely; some analysis was in-depth, gave the measures, and the conclusions were well supported; while other analysis was brief and appears to only be a statement of professional opinion. This could be satisfactory if the measures and the rationale for the professional opinion were also included.

We request that a hard look be given to the cumulative effects analysis; that it be organized and thoroughly indexed. The index should link Chapter 3, Appendix F, and the Specialist reports.

We also request that a common format be used, and the measures be clearly presented. We make this request because cumulative effects as presented may present a very strong vulnerability of the DEIS.

Issue 7: Missing Information

In Chapter 3, Affected Environment, page 311, and in Appendix F the Cumulative Effects, page 675, it states "A summary from the range specialist report is presented here and the complete report is incorporated by reference (Hannemann 2013)." On the Forest Service web site,

http://www.fs.usda.gov/detail/4fri/home/?cid=STELPRDB5292025 the referred to range specialist report is not listed. We request that this be made available for review.

Summary

The agency is supportive of the preferred alternative and associated Forest Plan amendments. State Forestry commends this historic landscape project that offers the potential to make substantial progress in protection of our forested communities, restoring our forests and watersheds, and providing much needed economic opportunities in our forest dependent communities. The comments submitted by Arizona State Forestry are done so with the intent to strengthen and help speed the implantation ofthis project.

Sincerely,

Scott Hunt State Forester

Coconino Natural Resource Conservation District

28 May 2013

Scott Harger
Program Range Conservationist
Coconino Natural Resource Conservation District (CNRCD) 703 E. Sawmill Road
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Earl Stewart
Forest Supervisor, Coconino National Forest – 4FRI 1824 S. Thompson St.
Flagstaff, AZ 86001
Comments submitted via 4fri_comments@fs.fed.us

Subject: 4FRI DEIS, 29 March, 2013 (Based on NOA)

Dear All:

CNRCD is pleased to respond to your request for comments on the subject DEIS.

1. This DEIS is a very impressive accomplishment. Despite its unprecedented scope, the collaborative effort associated with 4FRI has made it very familiar and relatively easy to follow, 700 plus pages notwithstanding. We are particularly pleased with the appendices C, F, and G.

CNRCD hopes that Alternative C will be chosen to implement the much needed restoration of this portion of the 4FRI.

2. That same familiarity has raised our confidence level considerably. As a stakeholder in the 4FRI collaboration, we have considered and endorsed the comments submitted by that organization. We think that the DEIS evaluation committee and subcommittees were also the beneficiaries of the extended collaborations, and have submitted a very minimalist set of comments. From the CNRCD standpoint, we wish to emphasis our interest in the USFS responses to 4FRI Key Issues 1 (Degree of Openness) and 6 (Monitoring and Adaptive Management.)

4FRI Issue 1 (Openness.) Since the success of implementing this vast project is largely a product of how treatments are implemented at the stand level, we will be looking hard at the response to collaborative comments regarding quantification of openness, operator training, monitoring, and adaptive management.

4FRI Issue 6 (Monitoring and Adaptive Management.) We always try to stay focused on implementation, impacts, and mitigation when we review an EIS. It is hard for us to know if we should expect the Implementation Plan or the Monitoring and Adaptive Management Plan to be more complete at this stage. Again, we will be looking very hard at the USFS responses to all five recommendations under Key Issue 6, (Monitoring and Adaptive Management,) of the 4FRI Comments.

3. CNRCD is a long-time member of the Greater Flagstaff Forest Partnership (GFFP) and sits on their board. We have reviewed their comments, and endorsed them.

4. CNRCD has the following specific comments and requests to make:

Page 24: Is there a need to "reduce excessive surface fuel loadings in areas adjacent to and within…" values at risk besides MSO habitat, like WUI's, streamside protection zones, recreation infrastructure, nest sites, and other patches of "dense" forest? We suspect the answer must be yes and needs expansion for the FEIS.

Page 38 1st Para under Response: It is unclear how elements of the Vegetation Analysis have been incorporated. Is it referenced? The results of this analysis probably made their way into one or more tables – could you include a pointer in the text?

Pages 55-56 Grazing and Livestock bullets: Although we are nominally satisfied with the content of the bullet arguments made here regarding grazing as part of an alternative, we strongly suggest that the USFS make a fine point of the adjustments to past practices that will come from reintroduction of fire as a management tool to restored areas with grazing allotments.

Page 339: "Scott Harger, NRCS" should read "Scott Harger, CNRCD"

Pages 397 and 689, Table 152, Grazing; Please send a copy of the Range Specialist Report, Coconino and Kaibab Four-Forest Restoration Initiative (4FRI), DEIS. Ms. Said to be on file at CNF, 4FRI project record. 44pp, to Scott Harger. E-mail preferred.

Pages 573-575 Rangeland Management section: We are surprised to read the statement that "Restrictions in grazing of livestock would primarily occur after prescribed fire in a pasture." We are not surprised by post-fire restrictions, but by the omission of pre-burn grazing prescriptions to allow for sufficient fine fuels accumulation to support a prescribed burn. If pre-burn restrictions are not needed or expected, would you please specifically say so? This would provide the clarity that is craved by our ranching constituency. This issue has been raised in stakeholder meetings.

Pages 622-625: This is another comment regarding quantification of openness, specifically proportions. We are concerned about ranging sufficiently about the median values for BA, interspaces, etc. We look forward to this discussion in the FEIS.

Page 628, LOPFA Burn Only Treatment Design: Should say "Prescribed fire will be used…" instead of "…may be used…" This is the only case where "may" needs substitution, although we would like to see "will" used in all treatment designs.

Page 641 Prescribed fire bullets, and page 674 App E Table 145: Do the USFS fire regime or FRCC model(s) function for Pine-Sage and Grassland ecotypes? In other words, do the results change after treatment? This is important to understand so that in monitoring we use the right criteria to measure effectiveness. Is it judged by FRCC change, or the fact that prescribed fire may be used subsequent to treatment? A brief clarification in the FEIS would be helpful.

Scott Harger

Cc: CNRCD Clerk of the Board GFFP Admin

Arizona Department of Environmental Quality

Brad Busby, Smoke Management Coordinator
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(602) 771-7676
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5/29/2013

Thank you for the opportunity to comment on the Draft Environmental Impact Statement for the Four-Forest Restoration Initiative. The alternatives described may include the use of prescribed fire, amongst other methods, to achieve land management objectives throughout much of the project area. As you are aware, prescribed fire creates smoke that includes a complex mix of air pollutants. Prescribed fire planning must consider the effects of smoke on sensitive areas and address potential impacts of smoke on air quality and the public in terms of health, nuisance, and visibility.

The project area is large, encompassing many smoke sensitive communities, with some proposed burn areas located near Class I Areas. Clean Air Act (CAA) requirements include the protection of visibility in Class I Areas and avoidance of violations of the National Ambient Air Quality Standards. All Prescribed fire projects must also comply with the requirements of Arizona Administrative Code R18-2-1501 through 1515, Forest and Range Management Burns. These are rules which manage for smoke emissions that are produced from prescribed fire activities in Arizona. A copy of those rules can be obtained at the following Web site:

http://www.azsos.gov/public_services/Title_18/18-02.htm

In addition to these initial measures for air quality, we appreciate your willingness to work within the Arizona Enhanced Smoke Management Program. We encourage you to actively

pursue any emission reduction techniques that can be utilized to mitigate smoke emissions. These techniques should be included in future analyses as measures that will be used to help reduce impacts on air quality. Conducting burns using aerial ignition, burning in a mosaic pattern, isolating fuels, burning before green-up, and using backing fire are just some of the techniques commonly used to reduce emissions from prescribed burns. Additionally, it is always helpful to do a public notification for smoke-sensitive individuals prior to burning as a way to address the public's potential smoke concerns.

Please contact me if I can be of any assistance or clarify any of the above statements.

Sincerely,

Brad Busby

Arizona Department of Environmental Quality

Smoke Management Coordinator

(602) 771-7676

U.S. Department of the Interior

Office of the Secretary
Office of Environmental Policy and Compliance
Pacific Southwest Region
333 Bush Street, Suite 515
San Francisco, CA 94104

29 May 2013

Henry Provencio Team Leader
Tonto National Forest Supervisor Office
U.S. Forest Service 2324 E. McDowell Road Phoenix, Arizona 85006

Subject: Draft Environmental Impact Statement (DEIS) US Forest Service (USFS), Four- Forest Restoration Initiative, Coconino and Kaibab National Forest, AZ

Dear Mr. Provencio:

The Department of the Interior (Department) is providing comments on the U.S. Forest Service's (USFS) Draft Environmental Impact Statement (DEIS) for the Four-Forest Restoration Initiative (4FRI) on the Coconino and Kaibab National Forests (NFs), Arizona.

We would like to express our support for this important project and appreciation for your willingness to work with us to incorporate listed and sensitive species' needs into proposed action alternatives. Over the last 8 years, resource management staff within Departmental bureaus have participated in the 4FRI collaborative planning process. The 4FRI would address fire risk reduction and forest health within remaining watershed and view-shed areas.

Mexican Spotted Owl Recovery Plans

Overall, the DEIS is inconsistent in how it cites or refers to the original 1995 Mexican Spotted Owl Recovery Plan or the 2012 Revised Recovery Plan for the Mexican Spotted Owl. We recommend the Final EIS and supporting documents clearly articulate which Recovery Plan is being referred to in the text, use the appropriate terminology, and cite it appropriately.

We understand the existing Land and Resource Management Plans (Forest Plans) for the Coconino and Kaibab National Forests include standards and guidelines from the 1995 Recovery Plan, and we appreciate efforts to incorporate information from the 2012 Revised Recovery Plan. However, it is unclear how or which guidance is being applied from which Recovery Plan. If there is any technical assistance we can offer you to provide clarity, please contact the U.S Fish and Wildlife Service (FWS), Flagstaff Ecological Services Field Sub-Office.

Summary

Summary, page iii: In the summary, and throughout the DEIS, the word "mortality" is used improperly. "Mortality" is a rate and" fatality" is the act of dying. For example, third paragraph of the summary section states, "The remaining old pines are at risk of mortality from the increased overcrowding of trees…" The old trees are at risk of fatality from the stated factors. We recommend as the DEIS is edited, the use of these terms be corrected throughout.

Major Conclusions, page xi: This section states to varying degrees, all action alternatives (B-D) meet the forest structure and pattern, forest health, and vegetation composition and diversity elements of the purpose and need. However, when reviewing summary data and information provided in Chapter 3 (Affected Environment and Environmental Consequences), it is unclear how Alternatives B and D improve large oaks, compared to Alternative C (eighth bullet, page xi).

Large Gambel oak trees are an important key habitat component in ponderosa pine forests for the threatened Mexican spotted owl (Strix occidentalis lucida), their prey species, and many migratory bird species. Alternative C would be more conducive to maintenance and development of large oaks. We recommend providing more clarity regarding this determination in the Final DEIS.

Major Conclusions, page xii: The top of this page states, "All action alternatives provide and sustain long-term Mexican spotted owl nesting and roosting habitat and reduce the risk of high severity wildland fire and other natural disturbances." After reading Chapter 3, it seems that not all action alternatives are equal in this respect. Both Alternatives B and D allow for burning in 72 Mexican spotted owl Protected Activity Centers (PACs), but exclude the nesting and roosting cores.

One of the comments the Mexican Spotted Owl Recovery Team received consistently from USFS fire management staff over the years is it is unrealistic to implement prescribed burns in most PACs, but exclude the core areas. Since neither Alternative B nor D allows for prescribed fire to enter core areas, these important habitats could be at higher risk for high severity wildland fire in the future and may be adversely impacted by efforts to prevent fire from entering core areas through the creation of fire breaks between the adjoining PAC habitat and the core areas.

We recommend the USFS continue to work with us to determine what actions will provide the most long-term benefit to the Mexican spotted owl nesting and roosting core habitat.

This section also states, "Alternative D (reduced use of prescribed fire) increases forest resiliency to large-scale impacts (including climate) in the short term. In the long term, however, over 300,000 acres would return to pretreatment conditions and would be susceptible to high-severity surface effects, which equates to reduced resiliency to natural disturbance."

From this description, Alternative D, which allows for prescribed fire on 178,790 acres (or 414,421 acres less than the Preferred Alternative C), does not meet the purpose and need of the project as described on page iii and in Chapter 1. We recommend providing more clarification in the summary and Chapter 3 discussions of Alternative D to better demonstrate how this alternative will reestablish and restore forest structure and pattern, forest health, and vegetation composition and diversity by allowing for the return of fire on only approximately 30 percent of the acres proposed for prescribed burning in Alternatives B and C.

Chapter 1 – Purpose and Need for Action

Mexican Spotted Owl Habitat, page 13: The Northern goshawk section on page 12 begins with a summary of the existing acres of habitat in the project area. We recommend this be done for the Mexican spotted owl section as well to improve clarity of the discussion in this section. The habitat acreages are provided in Table 7, but there is no description in the text of the total acres of Mexican spotted owl habitat or definitions of protected, restricted other, and restricted target/threshold habitat.

Final Proposed Action, Amendment 1, page 41: There is a significant typographical error in the second paragraph under this header. The amendment which would allow for designating less than 10 percent of restricted habitat should be for the Kaibab NF, not the Coconino NF.

Final Proposed Action, Amendment 2, page 42: This paragraph is unclear. Is the paragraph stating Amendment 2 would allow for both designating less than 10 percent restricted habitat in pine-oak as target or threshold AND remove language that limits PAC treatments in the recovery unit to 10 percent? In addition, though the current Forest Plan incorporates the 1995 Recovery Plan language regarding treating only 10 percent of the PACs within a Recovery Unit and then evaluating those treatment effects before treating additional acres, this language does not discuss treating in "increments of 10 percent."

We recommend clarifying the description of this amendment so it is clear to the reader what this amendment is modifying in the Kaibab NF Plan.

Chapter 2 – Alternatives

Incorporate the Original Large Tree Retention Strategy (LTRS), pages 56-58: All though this section is designed to articulate to the public why the LTRS was not an alternative analyzed in detail, it neglects to provide information indicating how the USFS intends to protect large trees. We recommend providing examples from proposed Mexican spotted owl and northern goshawk habitat management (included in all action alternatives to some degree) that will work to maintain and protect large, old trees throughout the project area.

This section focuses on all of the reasons why the USFS may need to cut large trees, but does not describe how the alternatives analyzed in detail provide for large tree protection. This comment also applies to the following section regarding limiting mechanical treatments to 16 inches diameter-at-breast height (d.b.h.) trees as a means to preserve large trees. This information could be included by reference with a single sentence added to each section that references later sections in the DEIS.

Although we understand the need to keep these sections brief and to the point regarding why these alternatives were not analyzed in detail, we believe it would support the argument to include a short statement indicating that removal of large, old trees would still be the exception and not the common practice of any of the action alternatives.

Alternative B – Proposed Action, page 63: This section lists several bullets describing the alternative (e.g., number of acres to be thinned and burned, number of acres to be burned only, etc.). This format is repeated for Alternatives C (page 80) and D (page 87). We recommend after each bullet, the Final DEIS provide where the appropriate documentation or data can be found for each of these alternative components. For example, the bullet "Utilize prescribed fire only on approximately 199,435 acres" would be followed by where in the document, website, or other location the information regarding that component could be found.

This would assist the public in finding the information needed to understand each of these alternatives and provide for better communication.

Alternative B Tables and Figures, Table 17, page 70: The treatment description/objective for Mexican spotted owl threshold and target habitat are listed as being the same treatment in this table (this is also true in Tables 24 and 27 for Alternatives C and D, respectively). Threshold habitat is habitat coming close to providing replacement nesting and roosting habitat for Mexican spotted owls.

Though treatments can occur in threshold habitat, it is important key habitat components not be reduced beyond specified points. However, target habitat is habitat on a trajectory to becoming threshold habitat, but may need more active management to develop the habitat components of nesting and roosting habitat. Therefore, habitat identified as threshold should not have the same treatment description/objective as target habitat. We recommend providing additional clarity in the biological assessment regarding treatment descriptions and objectives for Mexican spotted owl target and threshold habitats.

Amendment Descriptions for Alternatives B, C, and D (pages 64, 80-81, 87-88): We recommend including information regarding the benefit to the Mexican spotted owl from including the proposed amendments. Currently, these sections clearly articulate how the Forest will not be following the existing forest plans, but do not describe how the use of the amendments could benefit Mexican spotted owl habitat. There may be less confusion regarding the public's acceptance of these amendments if their habitat management needs were articulated as well.

For example, for Alternative C, Amendment 1 (page 80), the initial cause for and amendment could be modified to state (italicized text is our addition): "Amendment 1 would allow mechanical treatments up to 18-inches d.b.h. in order to improve habitat structure by promoting large tree growth, creating small openings to increase prey habitat diversity, and other site- specific goals in 18 Mexican spotted owl PACs. Large trees in owl PACs would not be targeted for removal, but would be removed as indicated to meet habitat and fuels protection objectives."

Adding additional explanation clarifies the need and justification for the amendment and should be provided for each of the amendment descriptions.

Tables 21 (page 76), 26 (page 85), and 29 (page 92): We recommend providing clarification as to whether the "Protected Habitat (Acres)" listed in these tables include only PAC acres or if it also includes protected steep-slope habitat. If the acreage includes both PACs and steep-slope habitat, we recommend splitting these out for ease of analysis in the biological assessment.

Chapter 3 – Affected Environment and Environmental Consequences

Soils and Watershed, Forest Plan Amendments, Alternative B and D, Coconino NF, Amendment 1 (page 117): This paragraph states Amendment 1 would result in the removal of more trees in 18 Mexican spotted owl PACs since trees up to 16 inches d.b.h. could be removed. The paragraph then goes on to describe removal of additional trees would improve vegetative ground cover. However, we question whether this would result in more trees being removed versus different trees being removed.

The point of increasing the diameter cap is not necessarily to remove more trees (though that may occur), but to improve our ability to implement uneven-aged management. We recommend this analysis should focus more on the desired conditions in PACs (see Revised Recovery Plan, Appendix C, pages 275-277) and less on the number of trees to be removed. We recommend focusing the discussion of effects on how increasing the diameter cap better allows us to meet the desired conditions for owl nesting and roosting habitat (uneven sized/aged groups, multistory canopy), versus merely removing more trees.

This comment also applies to the analysis for the increased diameter cap of 18 inches d.b.h. for mechanical removal of trees in Alternative C.

S**oils and Watershed, Forest Plan Amendments, Alternative C, Coconino NF, Amendment 1 (page 118)**: We recommend including language discussing how there may be adverse effects to PACs from attempting to keep prescribed fire out of nest cores while burning the rest of the PAC. This section describes the benefits of introducing low intensity prescribed fire, but should also include what management actions would need to be implemented (e.g., creation of fire line, cutting of snags) to preclude fire from these areas.

We also recommend stating there would likely be additional acreage within the PAC that would not be burned in order to keep fire from the nest core, so these areas would continue to be at risk from high-severity fire.

Vegetation, Kaibab NF, Amendment 2 in alternatives B and D (page 144) and Amendment 3 in alternative C (page 145): This section states if this amendment did not occur, treatments within Mexican spotted owl habitat would continue to meet the intent of the Mexican spotted owl Recovery Plan. We respectfully disagree with these statements as meeting the intent of both the original 1995 and 2012 Recovery Plans. Though there were specific recommendations to not cut above 9 inches d.b.h. in PACs in the 1995 Recovery Plan, this was included as a protective measure until more could be learned about thinning and burning within PACs.

The overall intent of both plans is to implement actions that maintain and/or enhance owl nesting and roosting habitat while monitoring to learn from these actions. If these amendments are not included and we are unable to use uneven-aged management to remove trees in PACs and increase the resiliency and sustainability of these areas, while monitoring the effects of our actions on owls, we will not meet the intent of the Recovery Plan. We recommend the USFS consider modifying this language throughout the DEIS to better articulate what will happen without the amendments.

Our interpretation is that limited thinning would occur within these PACs (up to 9 inches d.b.h.) that would remove some ladder fuels, but would not allow for release of overtopped Gambel oak, would not allow for creating small openings to increase prey habitat diversity, and would likely not allow us to learn how to treat these areas to maintain Mexican spotted owl occupancy and reproduction.

Terrestrial and Semi-aquatic Wildlife and Plants

Table 65, Threatened, endangered, candidate, and sensitive species evaluated in this analysis (page 175): We recommend including in the “Status” column of this table: “the bald eagle (Haliaeetus leucocephalus) is also protected under the Bald and Golden Eagle Protection Act (BGEPA).” In addition, the golden eagle (Aquila chrysaetos) is also a federally-protected species under the BGEPA, and should be included in this table.

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. BGEPA provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

"Disturb" means: “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In addition to immediate impacts, this definition also covers impacts that result from human- induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

Mexican spotted owl, Summary of Habitat Conditions (pages 179-180): Though we agree many Mexican spotted owl habitats are at risk from stand density-related mortality, we recommend more detail regarding the current stand conditions be included.

Owls currently reproduce successfully across the project area; if all Mexican spotted owl habitats were in a non-functioning condition, this would not be the case. Though there is much opportunity to improve the

resiliency and sustainability of these habitats, we would expect to maintain patches of habitat that continue to be denser than the majority of the landscape in order to provide the canopy cover and other habitat conditions typical of nesting and roosting locations.

In addition, we recommend including a citation for the statement, “There is decreased quality in prey habitat due in part to uncharacteristic canopy connectivity from in-growth of smaller trees inhibiting herbaceous understory development.”

MSO Habitat – Environmental Consequences

Alternatives B, C, and D – Direct and Indirect Effects (page 181) and Springs, Ephemeral Channels, Meadows, and Aspen (page 186): Please include in the analysis of effects, the effect of constructing fence within PACs to protect aspen. We would like to see the amount of proposed fencing to be constructed and what materials will be used included in the description of potential effects from the aspen treatments.

Forest Structure in PACs (page 181): For the Final DEIS, we recommend removing all references to the “draft recovery plan.” The Final Revised Recovery Plan for the Mexican Spotted Owl was issued in December 2012 and is no longer a draft document.

Disturbance (page 184): We recommend including more information regarding hauling and potential effects to Mexican spotted owls. It is our understanding that hauling could occur at any hour, including the middle of the night in the early breeding season (March – April) in order for trucks to operate on frozen ground.

In addition, it is possible over the life of this project (10 to 15 years) that with all of the additional trucks moving through Mexican spotted owl habitat at all hours of the day and night, it is possible owl could be struck by a truck. This possibility should be disclosed in the effects section.

This section states, “Core areas would be protected from prescribed fire by using roads, natural barriers, or new fire line to contain burn units. Building line would occur outside the nesting season.” Fire line construction in PACs frequently results in the loss of key habitat components (snags, large logs). Fire lines can also turn into social trails used by motorized vehicles.

We recommend including information regarding these potential effects of eliminating low intensity prescribed fire from all nest cores.

Forest Service Sensitive Species

Table 70 and Table 71, Northern leopard frog (pages 194-195, 201): We appreciate you working with us and the Arizona Game and Fish Department to develop and include protective measures for the northern leopard frog (Lithobates pipiens) as a part of this project. Your continued efforts to assist with the conservation of this imperiled species are appreciated.

Table 71, Bald Eagle (page 202): The effects analysis for the bald eagle should include a determination of whether or not take will be avoided (and how) per the BGEPA. In addition, we recommend the analysis of effects include the definition of disturbance from the BGEPA (included in our comments above). The description of effects in this table indicates there could be disturbance of eagles, which would be considered take under the BGEPA.

We will continue to provide technical assistance in regards to the effects analysis and work with you to develop conservation measures to reduce and/or remove adverse effects from the proposed action.

Table 71, Narrow-headed gartersnake (page 211): In the description of environmental consequences for the gartersnake, spring restoration is noted as providing beneficial effects for the species. Which springs has the Forest identified for restoration to improve habitat for the narrow-headed gartersnake?

Northern Goshawk, Environmental Consequences, Other Activities (page 222): This section states that Mexican spotted owl habitat supports lower densities of rodent prey species than would habitat treated to meet goshawk habitat direction in the forest plan. Please provide information in the DEIS to support this statement. Though we agree that providing habitat for a generalist species, such as the northern goshawk, across a large landscape would likely provide for higher densities of some prey species, we disagree that Mexican spotted owl nesting and roosting, foraging, and dispersal habitat does not also provide habitat for a variety of prey species.

In addition, habitat management recommendations in the Revised Recovery Plan for the Mexican Spotted Owl should result in increased prey species diversity and densities across large areas as well (FWS 2012).

Other Protected Species, Golden Eagle (page 222): Because the golden eagle is protected by the BGEPA, we recommend moving the information and discussion regarding the golden eagle up to the section that includes federally-protected species, and so that it is presented closer to the discussion regarding the bald eagle.

Appendix D – Alternatives B Through D Implementation Plan, Section A – Management Direction, Desired Conditions, and Treatment Design, MSO Habitat (pages 610-617): We are available to work with the USFS staff to refine the implementation plan for the Mexican spotted owl and its habitat. We recommend planning an upcoming meeting to refine this guide in order to meet our mutual project tracking needs.

A**ppendix E – Alternatives B Through D Monitoring and Adaptive Management Plan (pages 659-674)**: There will be monitoring conducted to evaluate the effects of the proposed treatments on Mexican spotted owls that has yet to be defined, but will be included in the biological opinion for this project. When completed, we would like to see the monitoring plan adopted into the Adaptive Management Plan.

Appendix G – Bridge Habitat, MSO Protected, target/threshold, and restricted habitats (page 703): This section states, “Protected habitat is generally densely forested, target/threshold habitat is similar to protected habitat, and restricted habitat is slightly less dense than protected but still more densely forested relative to the surrounding treated areas outside of Mexican spotted owl designations.” Tree density is not a key habitat component of Mexican spotted owl habitat.

If we are trying to convey nesting/roosting habitat within protected activity centers and replacement nesting and roosting habitat patches (i.e., target/threshold habitat) provides higher canopy cover, more large trees, and tends to be more decadent than random or other patches of habitat, we would concur. However, we do not believe tree density is a measure of owl habitat. In addition, other restricted habitat (not identified as target/threshold) is treated to varying degrees as described in the DEIS, but our understanding is that it will be relatively open (70 to 90 square feet per acre basal area). We recommend re-wording this initial description to reflect the relatively more closed-canopy condition it will provide versus describing it as “dense.”

Appendix G – Bridge Habitat, Implementation guide – MSO guidance (page 709): We recommend these guidelines be modified to reflect the proposed alternatives. For example, the first bullet states, “Each PAC has a 100-acre, no treatment area around the known nest or roost site.” Depending upon which alternative is implemented this may or may not be true. In Alternative C, some nest cores may be mechanically treated and burned.

We encourage the USFS to clearly state this in the appendix to be clear to the reader what design feature will be implemented under each alternative.

We appreciate the opportunity to review 4FRI DEIS. The Department agrees with the USFS that moving forward with the 4FRI project is vital to landscape restoration, wildfire risk reduction, wildlife habitat management, watershed function, and scenic quality and visitor retention with the project area.

The Arizona Ecological Services Field Sub-Office is available to discuss these comments with the USFS. If you have any questions or need additional information, please contact Steve Spangle, Supervisor, Arizona Ecological Services Field Office, Phoenix, Arizona, at 602-242- 0210, or Paul Whitefield, Natural Resource Specialist, Flagstaff Area Monuments, Flagstaff, Arizona, at 928-526-1157 extension 235.

Sincerely,

Patricia Sanderson Port Regional Environmental Officer

cc:

Director, OEPC
OEPC Staff Contact: Lisa Chetnik Treichel Regional Director, FWS, Albuquerque, NM Steve Spangle, Supervisor, FWS
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Eastern Arizona Counties Organization

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May 25, 2013

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File Code: Four-Forest Restoration Initiative EIS: Kaibab and Coconino #34857

Re: Eastern Arizona Counties Organization comments on the Draft Environmental Impact Statement for the Four-Forest Restoration Initiative.

Dear Responsible Official,

The Eastern Arizona Counties Organization is a local government organization created in 1993 by joint resolutions of the Boards of Supervisors and an Intergovernmental Agreement (IGA) between the Counties of Apache, Gila, Graham, Greenlee and Navajo to implement Presidential Executive Order 12372 (P.E.0. 12372) Intergovernmental Review of Federal Programs related to the clearinghouse process for review of Federal programs which affect the custom, cultures and economic well-being of the Counties.

The Eastern Arizona Counties Organization has been a stakeholder in the effort to develop and implement landscape scale forested ecosystems restoration for the last decade and has been involved in the creation of the White Mountains Stewardship Project; the Governor's Forest Health Council's Statewide Strategy for Restoring Arizona Forests; the collaborative Analysis of Small-Diameter Wood Supply in Northern Arizona; and, what has become the Four Forest Restoration Initiative.

The Eastern Arizona Counties Organization appreciates the opportunity to comment on the Draft Environmental Impact Statement for the Four-Forest Restoration Initiative, and would like to offer the following comments, gap analysis and suggested actions.

For ease of reading, the Eastern Arizona Counties Organization comments have been organized in chapter form, and a table of contents is inserted on the following page to facilitate the navigation of the document.

Eastern Arizona Counties Organization's Objectives as Expressed in its Plans and Policies

Eastern Arizona Counties Organization

The Eastern Arizona Counties Organization is a local government organization created in 1993 by joint resolutions of the Boards of Supervisors and an Intergovernmental Agreement (IGA) between the Counties of Apache, Gila, Graham, Greenlee and Navajo to implement Presidential Executive Order 12372 (P.E.0. 12372) Intergovernmental Review of Federal Programs related to the clearinghouse process for review of Federal programs which affect the custom, cultures and economic well-being of the Counties.

Following Arizona Governor Executive Orders 90-21 and 83-6, the Policies and Procedures for Arizona's Review Process in Compliance with Presidential Executive Order 12372 were established, and Apache, Gila, Graham, Greenlee and Navajo Counties, regrouped into the Eastern Arizona Counties Organization, were designated as County Official Reviewers (COR) for the explicate review of direct federal projects by the U.S . Department of Agriculture and its respective agencies (U.S. Forest Service, Soil Conservation Service and Farmers Home Administration) and the U.S. Department of the Interior and its respective agencies (Bureau of Land Management, National Park Service and U.S. Fish and Wildlife Service) affecting their areas.

For 20 years since its creation, the Eastern Arizona Counties Organization has been representing the custom, culture, health, safety and economic well-being needs of its county members' residents and visitors with Federal and State agencies engaging in projects addressing a broad range of issues, with an emphasis on natural resources management.

The five counties ("the Counties") of the Eastern Arizona Counties Organization ("ECO") are located in eastern Arizona along and beneath the Mogollon Rim that marks the southern edge of the Colorado Plateau. Five characteristics of the Counties are particularly relevant to the Draft Environmental Impact Statement for the Four-Forest Restoration Initiative ("the 4FRI DEIS"):

1) Three of the four national forests regrouped into the Four Forest Restoration Initiative ("4FRI"): the Coconino National Forest, the Apache-Sitgreaves National Forests, and the Tonto National Forest, are located within four of the five ECO Counties: Navajo, Apache, Gila, and Greenlee.

2) The national forests of 4FRI, and other federal lands, occupy a very large proportion of the area of the ECO Counties: 9% of the land in Navajo County, 11% in Apache County, 55% in Gila and 77% in Greenlee County.

3) The landscape scale catastrophic wildfires in the national forests of the Southwest have a disproportionately large impact on the ecological, social and economic life of the ECO Counties, and on the health and safety of their residents and visitors. Four of the five largest wildfires in Arizona, including two of the largest wildfires in the nation, have occurred within the ECO Counties in the last decade: the Rodeo Chediski Fire of 2002 that consumed 460,000 acres; the Willow Fire of 2004 that burned 120,000 acre; the Cave Creek Complex Fire of 2005 that blazed through 244,000 acres and the Wallow Fire of 2011 that charred 538,000 acres.

4) Outdoor recreational activities conducted in the 4FRI national forests, such as, but not limited to, camping, motorized recreation, hunting, fishing, hiking, etc. by the local residents, and by visitors to the ECO Counties recreating from metro Arizona to the Rim Country, have a

disproportionately large impact on the economic well-being and the economic development of the Counties.

5) The ECO Counties individually and collectively have made long term commitments to proactively participate in, assume leadership roles in and provide political support at the state and federal levels for forest restoration and wildfire prevention efforts at local and landscape scales, such as the White Mountain Stewardship Project and the Four Forest Restoration Initiative that the ECO Counties have been instrumental in creating and fostering.

As such, the Eastern Arizona Counties Organization has a special interest in the Draft Environmental Impact Statement for the Four-Forest Restoration Initiative.

While the Eastern Arizona Counties Organization recognizes that it is only one of the many constituents of the U.S. Forest Service, and does not seek special consideration in the current comments and review process, we urge the Responsible Official to pay careful attention and give due consideration to the following comments in view of the uncommonly large effect that Forest Service land management decisions regularly have directly, or may occasionally have indirectly, on the ECO Counties' residents and visitors' enjoyment, custom, culture, health, safety and economic well-being.

The ECO Counties individually and collectively have been uniquely involved in:

- Developing the concept of industry funded landscape scale restoration in Arizona;
- Fostering the collaborative agreement that resulted in the 4FRI project;
- Organizing the political support at the state and federal levels that made 4FRI possible;
- Lobbying for the funding of landscape scale restoration in general, and 4FRI in particular, through the Collaborative Forest Landscape Restoration Program (CFLRP); and,
- Resolving regulatory issues with the U.S. Department of Agriculture (USDA) and the U.S. Forest Service Washington Office (USFS WO), such as the cancellation ceiling issue, which hindered the implementation of industry funded landscape scale restoration.

The Eastern Arizona Counties Organization, therefore, understands particularly well the issues at hand, the management processes engaged, the desired future conditions, and the difficulties and challenges involved. ECO appreciates fully the USFS 4FRI Team's intent to: i) ensure an adaptive management planning and implementation process that is inclusive, efficient, collaborative and science-based to promote healthy, resilient, diverse and productive national forests and grasslands; ii) support natural resources-based rural economic development and employment; and, iii) ensure the enjoyment of the 4FRI national forests by the current and future generations in a balanced approach of preservation, conservation and sustainable exploitation of the natural resources.

In a spirit of continuous improvement, and based on the direct practitioner knowledge and experience gained through a uniquely long, diverse, often productive and sometimes difficult participation in the Forest Service planning and implementation processes, the Eastern Arizona Counties Organization would like to share its comments, its appreciation for the obvious work put into the 4FRI DEIS, and its concerns and suggestions as follows.

Role of the Eastern Arizona Counties Organization in the 4FRI DEIS Process

The Eastern Arizona Counties Organization recognizes that the 4FRI DEIS is a Forest Service-driven technical process, and generally supports the analysis mechanisms deployed by the USFS 4FRI Team to complete the assessment and the technical part of the planning.

Although the Eastern Arizona Counties Organization and the ECO Counties retain and employ many talented individuals at the peak of the knowledge curve in their respective fields, ECO does not generally define its role in the public lands management process as a role of science provider or resources technical specialist. Rather, as an organization representing the most direct and local expression of democratic government at the individual district or national forest level, ECO more generally defines its role at the policy-making level as it relates to public lands management processes.

Therefore, although several of the following comments do apply to the technical aspects of the 4FRI planning processes, they purposefully do not address specific technical mechanisms thereof, and the Eastern Arizona Counties Organization is mostly satisfied that the USFS methodology is generally satisfactory, and that the studies that the USFS 4FRI Team in their expertise deem reliable, are adequate to support their technical conclusions (Lands Council v. McNair 537 F.3d 981 - 9th Cir. 2008).

Therefore, the Eastern Arizona Counties Organization will focus its engagement in the 4FRI DEIS process, and its comments and suggestions, at the policy-making level and on whether the 4FRI Preferred Alternative contributes to the ECO Counties' residents' and visitor's enjoyment, custom, culture, health, safety and economic well-being. ECO will further focus its engagement on whether the 4FRI Preferred Alternative is consistent with the objectives of the ECO Counties as expressed in their plans and policies; on how the 4FRI project impacts related planning efforts by the ECO Counties; and, on the compatibility with and interrelated impacts of the 4FRI project and the ECO Counties' plans and policies.

Coordination between the 4FRI Project and the Eastern Arizona Counties Organization's Objectives, Plans and Policies

Per the requirements contained in the 2012 Planning Rule, Title 36 - Parks, Forests, And Public Property, Part 219 - Planning, Subpart A - National Forest System Land Management Planning, Section 4 - Requirements for public participation, subsection (b) Coordination with other public planning efforts, the Eastern Arizona Counties Organization expects that: "The responsible official shall coordinate land management planning with the equivalent and related planning efforts of federally recognized Indian Tribes, Alaska Native Corporations, other Federal agencies, and State and local governments" (36 CFR 219.4 (b)(1)).

The Eastern Arizona Counties Organization further expects that: "The results of this review shall be displayed in the environmental impact statement (EIS) for the plan", and that "this review shall include consideration of: (i) The objectives of federally recognized Indian Tribes, Alaska Native Corporations, other Federal agencies, and State and local governments, as expressed in their plans and policies; (ii) The compatibility and interrelated impacts of these plans and policies; (iii) Opportunities for the plan to address the impacts identified or to contribute to joint objectives; and, (iv) Opportunities to resolve or reduce conflicts, within the context of developing the plan's desired conditions or objectives" (36 CFR 219.4 (b)(2)).

The Eastern Arizona Counties Organization posits that these statutory requirements are meant by Congress to imply more than a perfunctory review process resulting in a check mark in a

'coordination box' and imply a sincere and proactive resolution effort to reduce and resolve potential conflicts between aspects of 4FRI DEIS and objectives expressed in the ECO Counties' plans and policies; such as, but not limited to, those relevant to forested ecosystems restoration and catastrophic wildfire prevention objectives, watersheds restoration objectives, rangelands resources management objectives, or forest products resources management objectives.

Eastern Arizona Counties Organization Request for Cooperating Agency Status

The Eastern Arizona Counties Organization is committed to resolve or reduce potential conflicts between the 4FRI DEIS and the ECO Counties' plans and policies, and understands that such resolution must take place within the context of developing the 4FRI project's desired conditions or objectives.

To this effect, it is the intent of the Eastern Arizona Counties Organization to avail itself of the opportunity contained in the 2012 Planning Rule that specifies that: "Where appropriate, the responsible official shall encourage States, counties, and other local governments to seek cooperating agency status in the NEPA process for development, amendment, or revision of a plan" (36 CFR 219.4 (a)(1)(iv)).

Eastern Arizona Counties Organization's Objectives as Expressed in their Plans and Policies

Eastern Arizona Counties Organization's Plans

The ECO Counties' policy making decisions and management actions are guided by the ECO Counties plans. These plans guide the actions of the Boards of Supervisors and their county staff toward meeting the present and future enjoyment, custom, culture, health, safety and economic well-being needs of the Counties' residents or visitors. The ECO Counties planning effort integrates the principles of:

1) Monitoring the effects and impacts of the implementation of the Counties policies, as well as the direct, indirect, individual and cumulative effects and impacts on the Counties and their residents and visitors of the policy decisions and management actions taken by state and federal agency partners;

2) Monitoring all demographic, social, economic, cultural and other variables, whether internal or external, which are relevant to the Counties' policy making decisions and management actions; and,

3) Dynamic and generally informal adaptive management.

As such, the ECO Counties plans are evolving dynamic plans that constantly adapt, often informally, in response to the evolving ecological, economic, social and cultural environment, and that are formulated as much through the regular deliberations of the ECO Counties' Boards of Supervisors and the resulting Resolutions of the Boards, as they are in the formal planning documents.

For the purpose of compliance with the statutory requirements of coordination between the 4FRI EIS and the ECO Counties' objectives as expressed in their plans and policies (36 CFR 219.4 (b)), the ECO Counties plans defined as the accumulation of the formal ECO Counties planning

documents and the ECO Counties public record of Boards of Supervisors deliberations and resolutions, are hereby entered into the 4FRI NEPA record.

Eastern Arizona Counties Organization's Objectives Relating to the 4FRI EIS

The Eastern Arizona Counties Organization appreciates and supports the extensive and thorough analysis performed by the USFS 4FRI Team for the 4FRI DEIS, and the discussion of the effects of the no action alternative and the three action alternatives on: Soils and Watershed; Vegetation; Fire Ecology; Air Quality; Terrestrial and Semiaquatic Wildlife and Plants; Aquatics; Noxious and Invasive Weeds; Heritage Resources; Tribal Relations; Socioeconomics; Recreation; Lands and Minerals; Scenery; Range; Transportation; Climate Change; Short-term Uses and Long-term Productivity; Unavoidable Adverse Effects; Irreversible and Irretrievable Commitments of Resources; and, Cumulative Effects.

Multiple resources analyzed individually by the USFS 4FRI Team in the 4FRI DEIS are regrouped in a smaller number of overarching natural resources management policy objectives by the ECO Counties. In no particular order, the Counties' natural resources management objectives relevant to the 4FRI DEIS comments include:

1) Rangelands Resources Management Objectives.

Rangelands Resources Management Objectives address issues such as, but are not limited to, grazing availability, suitability, sustainability; ecological, economic and social carrying capacity; access; contribution to rural economic development; and, contribution to local Western custom and culture.

2) Forest Products Resources Management Objectives.

Forest Products Management Resources Objectives address issues such as, but are not limited to, logging availability, suitability, sustainability, productivity, access; contribution to rural economic development; and, contribution to rural Western custom and culture.

3) Mineral and Energy Resources Management Objectives.

Mineral and Energy Resources Management Objectives address issues such as, but are not limited to, the availability, suitability, sustainability, productivity, access, and contribution to rural economic development of (a) solid, liquid or gaseous mineral resources and (b) solar, wind, hydropower, geothermal and other natural renewable energy resources.

4) Motorized Travel and Recreation Management Objectives.

Motorized Travel and Recreation Management Objectives address issues such as, but are not limited to, motorized access; motorized travel; motorized big game retrieval; motorized dispersed camping; motorized gathering of firewood; motorized access to dispersed fishing; motorized recreation opportunities; inventoried roadless areas; wilderness area designation; motorized access to grazing and logging opportunities; contribution of motorized access, recreation and travel to rural economic development; and, contribution to local Western custom and culture.

5) Forested Ecosystems Restoration and Catastrophic Wildfire Prevention Objectives.

Forested Ecosystems Restoration and Catastrophic Wildfire Prevention Objectives address issues such as, but are not limited to, protection of Counties' residents and visitors; protection of collective and individual real properties; protection of transportation, energy and water collection and distribution infrastructures; ecological restoration of forested ecosystems; local scale restoration projects; landscape scale restoration projects; social license required for the non-

conflictual and non-litigious implementation of restoration efforts (such as the one requested in public statements by former USFS Southwestern Regional Forester Corbin Newman for the Four Forest Restoration Initiative); industry development required to implement and fund restoration efforts through economically viable utilization of the wood products; and, long term guarantees of wood supply necessary to attract private investments in a small diameter utilization infrastructure in northeastern Arizona.

6) Watershed Restoration Objectives.

Watershed Restoration Objectives address issues such as, but are not limited to, ecological restoration of watersheds; protection and development of water collection and distribution infrastructures; monetization of watershed ecosystem services; downstream consumption contribution to upstream production investments and maintenance; and, interactions between watershed functions and multiple use functions.

7) Management Areas Designation Objectives.

Management Areas Designation Objectives address issues such as, but are not limited to, the nomination, designation, and management of (a) inventoried roadless areas (which are technically not management areas per se but are an administrative designation) and (b) wilderness areas, primitive areas, research natural areas, wildlife quiet areas, and wild and scenic rivers; and, effects on socioeconomic resources and impacts on the other County objectives.

The Eastern Arizona Counties Organization understands that some of these objectives are not directly relevant to the 4FRI DEIS inasmuch as, for example, the 4FRI alternatives are not contemplating the designation of management areas. However, most of these objectives are relevant to the 4FRI DEIS, inasmuch as the 4FRI alternatives either have direct effects on some Counties' objectives, such as Forested Ecosystems Restoration and Catastrophic Wildfire Prevention Objectives; Forest Products Resources Management Objectives; Watershed Restoration Objectives; and, Rangelands Resources Management Objectives; or, may have indirect effects on some Counties' objectives, such as Motorized Travel and Recreation Management Objectives.

For the purpose of compliance with the statutory requirements of coordination between the 4FRI EIS and the ECO Counties' objectives as expressed in their plans and policies (36 CFR 219.4 (b)), this document: Eastern Arizona Counties Organization comments on the Draft Environmental Impact Statement for the Four-Forest Restoration Initiative is hereby incorporated into the ECO Counties' expressed plans and policies.

The Eastern Arizona Counties Organization, therefore, expects that: i) the Responsible Official shall coordinate land management planning with the ECO Counties equivalent and related planning efforts (36 CFR 219.4 (b)(1)); ii) the consistency review and coordination action shall include consideration of the objectives of the ECO Counties as expressed in their plans and policies; and, iii) the Responsible Official shall consider opportunities to resolve or reduce conflicts, should some arise between the 4FRI DEIS and the ECO Counties' objectives (36 CFR 219.4 (b)(2)).

Request for Disclosure of Consistency Review and Coordination Action

Per the requirements of 36 CFR 219.4 (b)(2), 40 CFR 1502.16(c) and 40 CFR 1506.2, the Eastern Arizona Counties Organization hereby requests that the results of the consistency review and coordination action between the 4FRI DEIS and the ECO Counties' objectives as expressed in

their plans and policies shall be displayed in the Four Forest Restoration Initiative Environmental Impact Statement.

Forested Ecosystems Restoration and Catastrophic Wildfire Prevention Objectives

The Eastern Arizona Counties Organization appreciates and supports the fact that all three action alternatives include a clear priority for restoration treatments (PDEIS p. 62).

Constraint on the Eastern Arizona Counties Organization and the 4FRI DEIS Planning Efforts

The Eastern Arizona Counties Organization recognizes that the issues of forested ecosystem restoration and forest products management are fundamentally different, and are typically not discussed simultaneously in ecosystems non-departed or little departed from characteristic reference conditions. However, as the Forest Service and ECO both generally acknowledge: current conditions in the forested ecosystems and especially in the ponderosa pine and dry or wet mixed conifers-dominated forests of eastern Arizona are considerably departed from reference conditions, and at risk of continued uncharacteristic disturbances such as landscape scale catastrophic crown fires or insect infestations.

Also, the Eastern Arizona Counties Organization acknowledges and appreciates the efforts made by the Forest Service, and particularly the Arizona national forests, to pioneer larger scale restoration efforts such as the White Mountains Stewardship Project. ECO has been and continues to be supportive of the White Mountain Stewardship Project and of its funding as a practical tool to initiate larger scale treatments and to incentivize the creation of a small diameter trees utilization infrastructure. Simultaneously, ECO acknowledges that the model of subsidized restoration treatments is not scalable at landscape level, as is required to restore the forests of Arizona, for lack of agency funding.

As proposed in the Four Forest Restoration Initiative, an initiative that ECO was instrumental in creating, fostering and developing, landscape scale forest ecological restoration appears currently feasible only if it is funded by the economically viable utilization of the forested byproducts of restoration by private industry. While it is actually not a novation when it comes to forest products, as timber sales have been for centuries an established form of natural resources valuation and have funded the management of the resources, the concept of ecosystem services monetization is relatively new to the discussion of ecological restoration funding, and its full implications are still being tested.

As a consequence, the Eastern Arizona Counties Organization suggests that both the Counties and the USFS 4FRI Team operate under a very specific constraint when it comes to forest restoration, inasmuch as the forest products industry in Arizona is the funding mechanism for landscape scale restoration in eastern Arizona, which imposes the concept of social acceptability or ‘social license’ for appropriate scale industry to fund restoration logging activities at the landscape scale throughout the 4FRI project.

Eastern Arizona Counties Organization’s Forested Ecosystems Restoration and Catastrophic Wildfire Prevention Objectives

The Eastern Arizona Counties Organization’s Forested Ecosystems Restoration and Catastrophic Wildfire Prevention Objectives for the upcoming planning cycle include, among others:

1) Design and implement landscape-scale, consensus-based, industry-supported, accelerated community protection and forested ecosystems restoration in the 2.4 million acre ponderosa pine and mixed conifer-dominated forests of the Mogollon Rim.

2) Develop and sustain the social license required by Southwestern Regional Forester Corbin Newman as a prerequisite to the implementation of industry-supported landscape scale restoration.

3) Participate actively in the NEPA process, as a member of the public and as a Cooperating Agency, and provide robust comments to the Forest Service to ensure NEPA process integrity and survivability in the face of potential threats of litigation. Emphasize with the Forest Service a strategy of risk mitigation and focus on the end goal of accelerated restoration over partisan debates and exclusive focus on technical sciences to the detriment of social science and social license.

4) Create in eastern Arizona the wood supply conditions for private industry investments in a new economically viable small diameter trees and residual biomass utilization infrastructure capable of funding the initial ecological restoration thinning of at least 50,000 acres of ponderosa pine and/or mixed conifer-dominated forests annually for the next 20 years, then the maintenance of the desired future conditions in subsequent decades.

5) Wherever and whenever possible, prioritize forest byproducts treatments (mechanical treatments) funded by economically viable utilization, over non-byproducts treatments (fire as first entry thinning treatments) in order to create and sustain the wood supply necessary for a new era of forest products industry-based economic growth and employment in eastern Arizona with multiple industrial scale new investments.

Forest Products Resources Management Objectives

The Eastern Arizona Counties Organization appreciates and supports the fact that all three action alternatives include a clear focus on mechanical restoration treatments yielding forest products (PDEIS p. 62).

Challenge for the Eastern Arizona Counties Organization and the 4FRI DEIS planning efforts

The inherent challenge faced by the Eastern Arizona Counties Organization and the USFS 4FRI Team is that the priorities typically considered when managing forest products, such as a sustained yield of harvest volumes on a regulated non-declining even-flow basis for the long term, uneven age structures, long term sustained yield capacity (LTSYC), non-declining allowable sale quantity (ASQ), etc., are augmented and complicated, and to a large extent superseded, by the overwhelming priority to complete landscape scale restoration as rapidly as possible for fear of massively disruptive landscape scale catastrophic crown fires and/or landscape scale insect or disease infestations.

Owing to the fact that for the foreseeable future green forest products will likely be byproducts of restoration treatments, and green forest products will likely continue to be at risk of destruction by catastrophic fires if landscape scale restoration is not expeditiously implemented, ECO suggests that forest products management actions for the upcoming planning cycle must be dictated not only by traditional silviculture science and best practices, but primarily by the absolute priority of implementing landscape scale restoration as expeditiously as possible using mechanical treatments that produce the forest products necessary to not only sustain the existing

forest industry in the White Mountains, but also to allow robust natural resources-based rural economic development through the creation of an entirely new infrastructure of small diameter trees utilization at industrial scale.

Eastern Arizona Counties Organization's Forest Products Resources Objectives

The Eastern Arizona Counties Organization's Forest Products Resources Objectives for the upcoming planning cycle include, among others:

1) Create in eastern Arizona the wood supply conditions necessary for private industry investments in a new economically viable small diameter trees and residual biomass utilization infrastructure capable of funding the initial ecological restoration thinning of at least 50,000 acres of ponderosa pine and/or mixed conifer-dominated forests annually for the next 20 years, then the maintenance of the desired future conditions in subsequent decades.

2) Sustain in the White Mountains the wood supply conditions necessary for the continued development and growth of the existing local industry, with expanded economically viable small diameter trees and residual biomass utilization facilities capable of funding the initial ecological restoration thinning of at least 15,000 acres of ponderosa pine and/or mixed conifer-dominated forests annually for the next 20 years, then the maintenance of the desired future conditions in subsequent decades.

3) Subordinate for as long as required in the upcoming planning cycle the scientific silviculture priorities and traditional forest products management methods for sustained yield of harvest volumes on a regulated, non-declining even-flow basis for the long term, to the overriding priority of implementing as expeditiously as possible landscape scale restoration based primarily on mechanical treatments producing forest products.

4) Subordinate for as long as required in the upcoming planning cycle the scientific silviculture priorities and traditional forest products management methods for uneven age management to the overriding necessity of sustaining the social license required to implement landscape scale restoration expeditiously and in a non-conflictual and non-litigious manner, as relates to the protection of old growth and the retention of large trees (upcoming old growth) where vegetative structural stages (VSS) 5 and 6 are deficient at stand or forest scale.

Watershed Restoration Objectives

The Eastern Arizona Counties Organization appreciates and supports the analysis performed by the USFS 4FRI Team using the Watershed Condition Framework (WCF) to identify 6th level Hydrologic Unit Code (HUC) Class 1 (Functioning), Class 2 (Functioning-At-Risk) and Class 3 (Impaired) watersheds in the 4FRI project area, and to analyze the direct and indirect effects of the 4FRI project on water quality and water yield.

Critical Role of the Mogollon Rim Watershed for Arizona

Uncharacteristic landscape scale forest crown fires in eastern Arizona have a demonstrated negative impact on the conservation and operation of the watersheds in which they occur. In addition to the damages caused to communities and ecosystems by the fires themselves, the most common negative effects on watersheds documented after the Rodeo-Chediski Fire, the Wallow Fire, in some areas, and the Schultz Fire, among others, are: uncharacteristic runoffs, catastrophic flooding, accelerated and aggravated soil erosion, streams and reservoirs sedimentation, and long term severe disturbance of the watershed functions.

The Rim Country constitutes a large portion of the watersheds that contribute significantly to the water supply of the metro Arizona and greater Phoenix area. The threat of additional uncharacteristic landscape scale forest crown fires in eastern Arizona, especially on the south slopes of the Mogollon Rim, raises serious concerns about the conservation and operation of the eastern Arizona watersheds. Additionally, the specific risk to the East Clear Creek watershed poses an existential threat to the Town of Payson's water supply.

With the growing realization that uncharacteristic landscape scale forest crown fires affect the conservation and operation of the watersheds in which they occur, efforts to protect watersheds have recently been initiated in the Southwest. Several of these efforts focus on the monetization of the ecosystem services provided by the watersheds, and on an attempt to enroll the financial contribution of the downstream beneficiaries of the services (water consumers in this case) to the financial costs of protecting the upstream provider areas and the utility corridors delivering the services (forests, watersheds and water collection and distribution infrastructures at risk of catastrophic fires in this case).

Such efforts were pioneered by the Denver Forest to Faucet project in Colorado, or the Santa Fe Municipal Watershed Protection project in New Mexico, among others. In Arizona, with the active contribution of the Eastern Arizona Counties Organization, an effort to create the Arizona Watersheds Investment Fund (AWIF) is underway, and in Flagstaff, Ballot Question #405 received electors' approval in November 2012 for the issuance of a $10 million municipal bond to finance the restoration treatments of high threat areas in the Rio de Flag and Lake Mary watersheds to provide greater protection to the community from the impacts of fires and floods.

Therefore, the restoration of forested ecosystems, ponderosa pine and mixed conifer-dominated, in the watersheds of the Mogollon Rim in general, and specifically in the East Clear Creek watershed, is an objective priority, among other areas in eastern Arizona also in need of restoration treatments, for the Eastern Arizona Counties Organization, after the direct protection of communities and infrastructures.

Eastern Arizona Counties Organization's Watershed Restoration Objectives

The Eastern Arizona Counties Organization's Watershed Restoration Objectives for the upcoming planning cycle include, among others:

1) Prioritize restoration and catastrophic fire prevention treatments in the watersheds, after the direct protection of communities and infrastructures, on the slopes of the Mogollon Rim in general, and specifically in the East Clear Creek, Verde River, Little Colorado River, Upper Gila River, and Upper Salt River watersheds.

2) Develop the Arizona Watersheds Investment Fund (AWIF), and/or similar initiatives in order to fund restoration treatments that cannot be funded by the wood industry utilization of the forest byproducts of restoration in areas where the merchantable material yield is insufficient for mechanical treatments to be economically viable, or access by mechanical harvesting equipment is restricted, such as in steep slopes, high erosion areas, riparian areas, etc.

3) Develop in parallel and in a complementary manner all models of watersheds restoration funding such as industry funding, ecosystem services funding, municipal bonds funding, etc.

Rangelands Resources Management Objectives

The Eastern Arizona Counties Organization appreciates the addition of grassland restoration treatments to forestland treatments in Alternative C, the Preferred Alternative. ECO believes that

this addition is significant not only because it implies the restoration of approximately 50,000 acres of rangelands, but because it aptly diversifies the concept of landscape scale restoration from a restrictive interpretation of 'forested ecosystems restoration' toward a broader concept of truer 'landscape restoration.'

Eastern Arizona Counties Organization's Rangelands Resources Management Objectives

The Eastern Arizona Counties Organization's Rangelands Resources Objectives for the upcoming planning cycle include, among others:

1) Restore encroached grasslands, including the most departed semi-desert, Great Basin, and montane subalpine grasslands that have been invaded by trees (subalpine grasslands) and shrubs (semi desert and Great Basin grasslands) by removing trees and shrubs where economically feasible, promoting a mixture of native perennial grass species, implementing the periodic prescriptive use of mixed classes of livestock matching animal feeding habits with specific plant material, and reintroducing a regime of cool surface fires in order to reduce trees and shrubs colonization and erosion hazards, and to increase livestock forage production.

2) Adopt management practices that discourage the establishment of nonnative species and eradicate invasive weed species that have little to no forage value, recognizing the fact that the ecological or economic consequences of different exotic species are not all the same, and that the persistence of some nonnative species that are not necessarily undesirable or controllable, such as Kentucky bluegrass or Bermuda grass, may be beneficial from a socioeconomic perspective and a balanced management for multiple resource objectives.

3) Allocate grass reserves on an allotment-by-allotment basis through proper range management, rather than on a district-by-district basis, which requires additional financial considerations for improvement maintenance.

4) Shift the grassland management process from the concept of balancing livestock grazing with available forage - which only addresses stocking rate - toward the concept of managing the intensity, frequency, seasonality, duration and classes of livestock grazing to accomplish the rangelands resources management objectives.

5) Emphasize adaptive management of the rangelands using a three step rangelands resources management monitoring approach of quantitative monitoring using standard measurements such as stocking rate, ground cover, etc.; qualitative monitoring using measurements such as species composition, age, nutritional value, etc.; and, effectiveness monitoring using outcome measurements such as range health, soil water holding capacity, soil organic content, livestock weight gain, wildlife indicator species, etc., in order to measure whether the management actions produce the site specific and cumulative direct and indirect effects desired.

6) Integrate the scientific research and implement the science-based recommendations developed by rangelands resources management experts and scientists.

7) Preserve the contributions of the rangelands resources to the economic development and the custom and culture of the rural Arizona counties.

Gap Analysis and Suggested Actions for the Final Environmental Impact Statement

Preliminary Comments

The Eastern Arizona Counties Organization would like to preface any subsequent comment by the following four preliminary comments:

1. The quality and thoroughness of the work exhibited by the USFS 4FRI Team in the 4FRI DEIS is outstanding. The Eastern Arizona Counties Organization is fully conscious of the fact that an enormous commitment was made and delivered upon by the USFS 4FRI Team, and that a legitimate pride of ownership must rest with the authors of the DEIS, as well as the Specialists' reports and other documents not published with the 4FRI DEIS but nonetheless part of the 4FRI project record. ECO urges the USFS 4FRI Team to consider the ECO comments NOT as a critic of their work, but as a goodwill effort toward continuous improvement of the 4FRI EIS, and as a proactive effort by ECO to disclose its objectives, plans and policies, and the rationales that support them, to facilitate the statutorily required consistency review, coordination action and conflict reduction regarding potential discrepancies between the 4FRI DEIS and the ECO Counties' objectives as expressed in their plans and policies and as discussed in this document.

2. Strategically, the Eastern Arizona Counties Organization overwhelmingly supports the 4FRI project, the 4FRI DEIS effort, and the implementation of the 4FRI Preferred Alternative, provided that it is further refined per the following suggestions. Therefore, the following concerns and suggestions are not aimed at questioning the need to implement 4FRI but at pointing out to the USFS 4FRI Team potential issues, gaps or weaknesses in the substance and the process, which could be of a nature to compromise a non-conflictual and non-litigious implementation of the 4FRI project as intended by ECO and the ECO Counties.

3. The Eastern Arizona Counties Organization readily acknowledges that several of the following comments and suggestions have already been addressed and agreed upon by the USFS 4FRI Team in the course of the work conducted by the DEIS Review Workgroup of the 4FRI Stakeholders Group with the USFS 4FRI Team. Also, considering the participation of ECO in both the 4FRI Stakeholders Group and the DEIS Review Workgroup, there is a high probability that there will be some level of repetition and redundancy between the ECO comments and the 4FRI Stakeholders Group comments, as well as comments from other stakeholders. Nonetheless, the NEPA process calls for comments on the DEIS as published, and for the formulation of ECO's concerns and suggestions, regardless of whether these are echoed in other comments or not.

4. As previously noted, although the Eastern Arizona Counties Organization and the ECO Counties retain and employ many talented individuals at the peak of the knowledge curve in their respective fields, ECO does not generally define its role in the public lands management process as a role of science provider or resources technical specialist. Rather, as a body representing the most direct and local expression of democratic government at the individual district or national forest level, the Eastern Arizona Counties Organization more generally defines its role at the policy-making level as it relates to public lands management processes. ECO, therefore, believes that it is appropriate to comment at the programmatic level, from a Forest Service perspective, and at the objectives level, from a Counties' policy perspective.

Gap between the 4FRI DEIS and the Eastern Arizona Counties Organization's Objectives, Plans and Policies

For clarification, the Eastern Arizona Counties Organization wants to emphasize that although it generally supports the use of Best Available Scientific Information (BASI) for management decision, it does not support the exclusive use of technical sciences to formulate policies or to make strategic decisions that have an important impact on people. ECO believes that these decisions must integrate social sciences in the decision making process. For example, ECO believes that while there is no overwhelming supporting science on either side of the long debated issue of a universal diameter cap for restoration treatments (whether it be 9", 12", 16" or 18"), analyzing the issue of a diameter cap from just a technical science perspective is at best incomplete, because the issue of large trees retention is not only a technical issue, but also a social issue that cannot be adequately addressed by an exclusively scientific approach.

Therefore, the Eastern Arizona Counties Organization comments will purposefully not emphasize technical issues of silviculture, such as uneven aged composition, regeneration openings, etc., but will be focused on what the Counties believe to be the crux of the successful and timely implementation of the overriding priority of landscape scale scientifically and socially acceptable – if admittedly imperfect – ecological restoration and catastrophic wildfire prevention. Namely:

- Social acceptability of proposed treatments;
- Speed of completion of landscape scale restoration; and,
- Prioritization of treatments.

Alternative A

Gap analysis

Alternative A, the no action alternative, does not offer the option of continuing an existing management approach to landscape scale forested ecosystems restoration in eastern Arizona inasmuch as there is currently no such approach. Alternative A would nonetheless result in the mechanical treatment of approximately 87,000 acres, and in the prescribed fire treatment of approximately 143,000 acres over the next five years (DEIS p. 62). However, the scale and pace of these management actions are incompatible with the urgent need to implement landscape scale restoration as identified in the purpose and needs for the 4FRI NEPA process.

Therefore, the Eastern Arizona Counties Organization wants to communicate unambiguously to the USFS 4FRI Team its opposition to Alternative A.

The Eastern Arizona Counties Organization understands the NEPA requirement for the 4FRI DEIS to analyze a no action alternative, and ECO acknowledges and appreciates the existence of constituencies favoring no action. However, the Eastern Arizona Counties Organization cannot support an alternative that would result in the continuation of an unmitigated high risk of further landscape scale uncharacteristic disturbances such as catastrophic high intensity crown fires, or insect infestations, for the forests of eastern Arizona and their communities.

Consequently, the Eastern Arizona Counties Organization is concerned that Alternative A is in direct conflict with the Counties' objectives as expressed in their plans and policies.

Suggested action

The Eastern Arizona Counties Organization regrets to suggest that there is no possible corrective action to mitigate the incompatibility of Alternative A with the Counties' objectives as expressed

in their plans and policies, or to resolve or reduce the conflict between Alternative A and the Counties' objectives as expressed in their plans and policies.

Alternative A is so departed from the Mogollon Rim residents' and visitors' past, current, and foreseeable future custom, culture, safety and economic well-being needs, and from the Eastern Arizona Counties Organization and the ECO Counties' natural resources management objectives, that it does not warrant any further discussion from the Counties' perspective.

Alternatives B and C

Gap analysis

Alternative B (the original Proposed Action) and Alternative C (the Preferred Alternative) both generally meet the purpose and needs of landscape scale restoration in eastern Arizona, as analyzed by the USFS 4FRI Team, and the ECO Counties.

For all practical purposes, Alternative B (the original Proposed Action) and Alternative C (the Preferred Alternative) share many similarities:

1. The acreages treated, both mechanically and by fire-as-a-first-entry (approximately 388,000 acres treated mechanically and 588,000 treated with fire in Alternative B; and, approximately 434,000 acres treated mechanically and 593,000 treated with fire in Alternative C) are very similar; and,

2. The differences in acreage treated mostly result from the addition of grassland treatments to forestland treatments in Alternative C.

Nonetheless, there are some differences between Alternative B (the original Proposed Action) and Alternative C (the Preferred Alternative):

1. The addition of grassland treatments to forestland treatments in the Preferred Alternative is significant inasmuch as it diversifies aptly the concept of landscape scale restoration from a restrictive interpretation of 'forested ecosystems restoration' toward a broader concept of truer 'landscape' restoration;

2. The increase in mechanical treatments upper limit from 16" to 18" diameter at breast height (d.b.h.) in the Mexican Spotted Owl Protected Activity Centers (MSO PACs) in the Preferred Alternative, while relatively minor from a treatments perspective, is likely to have an impact on the social acceptability of the proposed treatments;

3. The integration of some reworded components of the stakeholders-developed Old Growth Protection and Large Trees Retention Strategy (OGPLTRS) in the Preferred Alternative is likely to have an impact on the social acceptability of the Preferred Alternative; and,

4. The integration of research projects in the Preferred Alternative is a welcome addition.

The Eastern Arizona Counties Organization clearly views the addition of grassland treatments to forestland treatments in Alternative C as a positive step toward meeting the ECO Counties' Rangelands Resources Management Objectives, and generally supports the integration of research projects into restoration implementation projects, wherever and whenever feasible. ECO further supports the integration of stakeholders-developed strategies and foundational documents such as the Old Growth Protection and Large Trees Retention Strategy (OGPLTRS) in the 4FRI DEIS.

Conversely, the Eastern Arizona Counties Organization is concerned that the adaptation of the stakeholders-developed Old Growth Protection and Large Trees Retention Strategy (OGPLTRS) into the USFS 4FRI Team Old Trees Implementation Plan (OTIP) and Large Trees Implementation Plan (LTIP) may have an impact on the social acceptability of the Preferred Alternative, as further discussed in the later section Old Growth And Large Trees.

Therefore, the Eastern Arizona Counties Organization generally supports the concepts presented in Alternative C, the Preferred Alternative, provided that it is further refined per the suggestions offered in the ECO comments, as well as comments from other stakeholders critical to the viability of the 4FRI social license.

However, the Eastern Arizona Counties Organization is concerned that some decisions made by the USFS 4FRI Team may compromise the social license developed for the implementation of the 4FRI project.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible social license risk for the 4FRI DEIS potentially caused by some decisions made by the USFS 4FRI Team that may compromise the social license developed for the implementation of the 4FRI project, present a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization respectfully suggests that the USFS 4FRI Team and the Responsible Officials exercise careful judgment in their decisions, in relation to: i) the true material importance of the issues, as opposed to their symbolic or emotional importance; and, ii) the potential effect of litigation on the implementation of the 4FRI project. ECO suggests that a careful and dispassionate costs / benefits analysis be conducted between the minor ecological or silviculture costs possibly attached to some stakeholders' recommendations, and the major benefits attached to sustaining the 4FRI social license.

Alternative D

Gap analysis

Alternative D is identical to Alternative B (the Proposed Action) as regards mechanical treatments. It is also identical to Alternative C (the Preferred Alternative) as regards mechanical treatments, except for the minor difference of upper limit of diameter at breast height (d.b.h.) in the Mexican Spotted Owl Protected Activity Centers (MSO PACs).

The critical difference between Alternative D and Alternatives B and C is the use of fire as a treatment. In alternative D fire would be used on only approximately 179,000 acres, compared to 588,000 acres in Alternative B and 593,000 acres in Alternative C.

The Eastern Arizona Counties Organization is concerned that the drastic reduction in the use of fire as a thinning treatment in Alternative D could prevent the timely completion of landscape scale restoration on the Mogollon Rim within the next 20 years as intended with the 4FRI project. ECO favors, wherever and whenever possible, prioritizing forest byproducts treatments (mechanical treatments) funded by economically viable utilization, over non-byproducts treatments (fire as first entry thinning treatments) in order to create and sustain the wood supply necessary for a new era of forest products industry-based economic growth and employment in eastern Arizona, with multiple industrial scale new investments. However, ECO also recognizes that industry funded mechanical treatments are not appropriate in many sensitive areas such as

steep slopes, fragile soils, riparian areas, etc., or in areas where the merchantable yield of restoration treatments would be economically unviable.

Further, the Eastern Arizona Counties Organization acknowledges that agency funded mechanical treatments or hand thinning are disproportionately expensive as compared to fire thinning, and ECO appreciates that, as discussed in a different context but still related to the implementation of 4FRI treatments in the Apache-Sitgreaves National Forests Land Management Plan PDEIS: “the alternatives were realistically designed to reflect anticipated budgets and workforce capabilities,” and “none of the alternatives would actually treat enough acres fast enough to fully reach desired conditions within the first 5 decades” (A/S PDEIS p. 440). The use of fire as a treatment tool is, therefore, not a luxury from a timeline, economic or practicality perspective, but is instead a necessity.

Additionally, ECO believes that the ecological role of fire is absolutely critical to the long term ecological sustainability of the forested ecosystems of the Southwest, and that a management alternative that would reduce unduly the use of fire could compromise, in the long term, the implementation of post-treatment maintenance burns.

In consequence, the Eastern Arizona Counties Organization wants to communicate unambiguously to the USFS 4FRI Team its opposition to Alternative D.

The Eastern Arizona Counties Organization understands the NEPA requirement for the 4FRI DEIS to analyze significantly different alternatives, and ECO acknowledges and appreciates the existence of constituencies concerned with prescribed fire emissions, and who favor alternatives such as Alternative D. However, the Eastern Arizona Counties Organization cannot support an alternative that could reduce the scope and significantly slow the pace of landscape scale restoration in eastern Arizona, which could result in the unnecessary prolongation of a high risk of further landscape scale uncharacteristic disturbances such as catastrophic high intensity crown fires, or insect infestations, for the forests of eastern Arizona and their communities.

Consequently, the Eastern Arizona Counties Organization is concerned that Alternative D is not compatible with the Counties’ objectives as expressed in their plans and policies.

Suggested action

The Eastern Arizona Counties Organization is concerned that there may not be a corrective action to mitigate the incompatibility of Alternative D with the Counties’ objectives as expressed in their plans and policies.

Alternative D is too departed from the Mogollon Rim residents’ and visitors’ past, current, and foreseeable future custom, culture, safety and economic well-being needs, and from the Eastern Arizona Counties Organization and the ECO Counties’ natural resources management objectives, to warrant further discussion from the Counties perspective.

Range of action alternatives

Gap analysis

Notwithstanding any of the above, the Eastern Arizona Counties Organization is concerned about the three action alternatives and the range of alternatives that they represent.

Specifically, even though the Eastern Arizona Counties Organization recognizes differences between the three action alternatives as discussed in the previous sections Alternatives B and C and Alternative D, ECO is concerned that the mechanical treatments in each of the three action

alternatives are similar enough in scale, scope and intensity that the DEIS may not offer an actual range of alternatives when discussing mechanical thinning. Arguably, the difference of upper limit of diameter at breast height (d.b.h.) in the Mexican Spotted Owl Protected Activity Centers (MSO PACs) is minor, and the addition of grassland treatments in Alternative C or the reduction of fire treatments in Alternative D do not affect forestland mechanical treatments per se.

The Eastern Arizona Counties Organization itself is generally satisfied with the mechanical treatments proposed in alternatives B, C and D, provided these treatments are refined to integrate the suggestions of the ECO Counties and other stakeholders integral to the 4FRI social license. However, ECO is concerned that the 4FRI DEIS could be perceived as a DEIS based on a single alternative of mechanical treatments, with nonsignificant variations between the three action alternatives.

Therefore, the Eastern Arizona Counties Organization is concerned that the 4FRI DEIS may fail to comply with the Council on Environmental Quality (CEQ) requirements to provide and analyze a range of alternatives (Sec. 1505.1 (e) and Sec. 1502.14 (a)) and that the absence of a broader range of analyzed mechanical treatments alternatives may present a process risk for the 4FRI DEIS.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible process risk for the 4FRI DEIS potentially caused by the absence of a broader range of analyzed mechanical treatments alternatives, presents a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization respectfully suggests that the USFS 4FRI Team request a third party legal review of the NEPA and CEQ requirements in, and of the 4FRI DEIS compliance with, Sec. 1505.1 (e) and Sec. 1502.14 (a).

Degree of openness

Gap analysis

The degree of canopy openness in the immediate post-treatment conditions and in the long term desired future conditions has for several years been an issue of debate among the 4FRI stakeholders and the 4FRI collaborative group, including the USFS 4FRI Team, and is likely to remain one. This issue is linked to the discussion of whether vegetative structural stages (VSS) and canopy closure should be measured at group level, as proposed in the 4FRI DEIS, or at stand level, as currently implemented under the Coconino National Forest Plan. Amending the Forest Plan will resolve the technical compliance issue, but it does not address the more fundamental question of whether guidelines originally designed to be implemented at stand or even forest scale (outside Mexican Spotted Owl protected areas) are directly transferable, or not, to groups within stands. Additionally, the creation of interspaces between groups, in addition to the creation of regeneration openings within groups, will undoubtedly result in a significantly lower canopy density than was deemed desirable in the Management Recommendations for the Northern Goshawk in the Southwestern United States.

Clearly, the USFS 4FRI Team has endeavored to be responsive to this concern, as evidenced in the 4FRI DEIS Appendix G Bridge Habitat, Appendix D Alternative B through D Implementation Plan, and in the silviculture Specialist Report. However, the Eastern Arizona Counties Organization is concerned that the issues raised by partner agencies such as the U.S. Fish and Wildlife Service and the Arizona Game and Fish Department, and by a broad range of

stakeholders, have not yet been fully resolved. Questions remain about how and at what scale post-treatment canopy openness will be measured, and how group size, basal area (BA), stand density index (SDI), interspaces, regeneration openings, trees per acre (TPA), and quadratic mean diameter (QMD) interrelate to result in a trajectory toward desired future conditions.

As previously noted, the Eastern Arizona Counties Organization does not generally define its role in the public lands management process as a role of science provider or resources technical specialist. Further, ECO readily admits that it lacks the technical competence to contribute meaningfully to the resolution of arcane technical issues such as density management and the relationship between treatment intensity, tree group density, and overall average density, as relates to the implementation of post-treatment openness. Suffice it to say that the very fact that the discussion continues unabated is concern enough to ECO that a zone of agreement has not been reached, or that the issues have not been understood clearly and broadly enough for the emergence of a general zone of agreement.

The Eastern Arizona Counties Organization understands that differences of opinions will exist regarding desired canopy openness. What concerns ECO is the confusion that exists about questions that should be answered with data, such as:

- Does science support the direct transfer of canopy density guidelines, originally designed to be implemented at stand or even forest scale, to groups (within stands)?
- How does canopy openness measured at group level compare with the reference condition?
- How and at what scale will post-treatment openness be measured in 4FRI?
- Does a range of basal area of 50 to 70 in the largest treatment categories provide enough flexibility for a full range of treatments, considering other metrics such as trees per acre (TPA), stand density index (SDI), percentage of interspace, and percentage of openings?
- How will habitat be provided to closed canopy and high closed canopy dependent species in the post treatment interim between the thinning of their current habitats and the natural development of high and dense canopy cover in the future old growth?

Therefore, the Eastern Arizona Counties Organization is concerned that the direct transfer of canopy density guidelines, originally designed to be implemented at stand or even forest scale, to groups, may be both a process risk and a social license risk for the 4FRI DEIS.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible process risk and social license risk for the 4FRI DEIS potentially caused by the direct transfer of canopy density guidelines, originally designed to be implemented at stand or even forest scale, to groups, presents a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization respectfully suggests the USFS 4FRI Team provide a clear and compelling analysis:

1. Presenting the science or, if science is lacking, the reasoning backing their decisions to transfer the canopy density guidelines originally designed to be implemented at stand or even forest scale, to groups;

2. Answering specifically the stakeholders' questions regarding the assumptions made in Appendix G Bridge Habitat (for example: percentage of openness at stand level including

interspaces and regeneration opening; percentage of existing old growth in old growth allocations; relative higher density of canopy in MSO and goshawk habitats post plan amendments; etc.);

3. Providing qualitative and quantitative 'visual' descriptions of post treatment objectives, including relative proportions and actual sizes of groups, stands, openings, etc., for each treatment type; and,

4. Explaining clearly how openness will be measured post treatments, how it will be monitored, how the monitoring data will trigger adaptive management, and at what thresholds.

Forest plans amendments

Gap analysis

As discussed above, and as analyzed in the 4FRI DEIS, forest plans amendments are technically required for 4FRI to be implemented under the current forest plans of the Coconino and Kaibab national forests. These amendments essentially address management actions (mechanical treatments up to 16" or 18" d.b.h., and low-intensity prescribed fire) in the Mexican Spotted Owl Protected Activity Centers (MSO PACs); and (a) resolve the issues of desired percentage of interspace within uneven-aged stands; (b) add the interspace distance between tree groups; and, (c) add language clarifying where canopy cover is and is not measured to facilitate restoration in goshawk habitat (excluding nest areas). The amendments also remove the cultural resource standard that requires achieving a "no effect" determination, and allow for a "no adverse effect" determination. The amendments further remove language referencing monitoring of Mexican Spotted Owl Protected Activity Centers (pre- and post-treatment, population, and habitat), and defer to the U.S. Fish and Wildlife Service the monitoring and design of the treatments in Mexican Spotted Owl protected habitats.

The Eastern Arizona Counties Organization understands the technical necessity of amending the forest plans and has no specific issue with the concept. However, ECO is concerned about the decision of the USFS 4FRI Team to characterize the amendments as nonsignificant, and to defer 4FRI projects design and monitoring in Mexican Spotted Owl protected habitat to the U.S. Fish & Wildlife Service, without including the U.S. Fish & Wildlife Service monitoring plan and guidelines for projects design in the 4FRI DEIS.

The Forest Service Manual provides guidance in Sec. 1926.52 Changes to the Land Management Plan That are Significant as follows: "2) Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period."

In the USFS 4FRI Team's own analysis in Appendix B Forest Plan Amendments: "The canopy cover portion of the amendment would affect 139,308 acres (18 %) of all goshawk habitat on the Coconino NF and about 35 % of goshawk habitat within the project area" (DEIS p. 466); and: "The amendment would affect approximately 20 % of all suitable goshawk habitats on the forest and about 27 % of goshawk habitat within the project area" (DEIS p. 482). It is unclear to the Eastern Arizona Counties Organization if there is an official percentage threshold for significance in the Forest Service regulations, but it seems that the common understanding of the word 'significant' - "a noticeably or measurably large amount" (Merriam Webster) - would include 35 % of goshawk habitat within the project area in the Coconino National Forest, or 27 % of goshawk habitat within the project area in the Kaibab National Forest. Citing these two percentages as precisely the reason why "For this reason, location and size (were) determined to

be nonsignificant" (DEIS p. 466 and p.482) seems questionable, unless guided by an agency guideline, in which case a reference would be useful. Additionally, it is unclear how the canopy cover portion of the amendments would affect only 35 % and 27 % of goshawk habitat respectively, although ECO speculates that it is related to higher vegetative structural classes (VSS).

Further, the Eastern Arizona Counties Organization is generally comfortable that habitat restoration and reduction of fire risk are key to improving Mexican Spotted Owl (MSO) habitat quality and, therefore, are aligned with both the current Coconino and Kaibab forest plans, as amended, and the U.S. Fish and Wildlife Service's (USFWS) revised MSO recovery plan (2012). However, ECO is concerned that deference of treatments design to another agency (USFWS) without integrating this agency's proposed treatments, or at least guidelines, in the 4FRI DEIS makes it impossible for the 4FRI DEIS Team to analyze the site specific and the cumulative effects of the treatments.

Therefore, the Eastern Arizona Counties Organization is concerned that the characterization of the forest plans amendments as nonsignificant, and the deferral of monitoring and treatments design to the U.S. Fish and Wildlife Service, without the inclusion of a USWFS monitoring plan or treatments guidelines, and without the possibility to analyze their effects in the 4FRI DEIS, may present a process risk for the 4FRI DEIS.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible process risk for the 4FRI DEIS potentially caused by the characterization of the forest plans amendments as nonsignificant, and the deferral of monitoring and treatments design to the U.S. Fish and Wildlife Service, without the possibility to analyze their effects in 4FRI, presents a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization respectfully suggests that the USFS 4FRI Team request a third party legal review of the Forest Service Manual requirements in, and of the 4FRI DEIS compliance with, Sec. 1926.52 as relates to a determination of non-significance.

The Eastern Arizona Counties Organization further respectfully suggests that U.S. Fish and Wildlife Service monitoring plan and guidelines for the design of treatments in Mexican Spotted Owl protected habitats be incorporated into the 4FRI DEIS, and that their expected direct and indirect site specific effects be analyzed, presented, and integrated into the cumulative effects analysis.

Old growth

Gap analysis

The adaptation of the stakeholders-developed single document Old Growth Protection and Large Trees Retention Strategy (OGPLTRS) by the USFS 4FRI Team resulted in two documents: i) the Old Trees Implementation Plan (OTIP); and, ii) the Large Trees Implementation Plan (LTIP). The Large Trees Implementation Plan (LTIP) is discussed in the following section Large Trees.

Clearly, the focus of the 4FRI stakeholders on old growth protection has been integrated by the USFS 4FRI Team in the 4FRI DEIS. Section C Old Trees Implementation Plan of Appendix D Alternative B through D Implementation Plan captures the essence of the stakeholders' old growth protection strategy: "Old trees would not be cut for forest health issues or to balance age

or size class distributions" (DEIS p. 644). The Eastern Arizona Counties Organization also observes that, as required in order to comply with the forest plans, old growth allocation in the 4FRI DEIS meets the 20% minimum requirement for vegetative structural stage (VSS) 6 Old Forest; and Appendix D Section B Decision Matrix for establishing tree groups, interspace, and regeneration openings, preserves trees with old tree characteristics.

However, the Eastern Arizona Counties Organization observes that, past the affirmative statements in the 4FRI DEIS, the actual field decisions are left open to individual judgment. While "human health and safety" (DEIS p. 644) should be a fairly objective criteria, "additional habitat degradation" may be more open to interpretation, as illustrated in Section C Old Trees Implementation Plan itself where the example of prevention of additional habitat degradation involves … road construction!

Further, the Eastern Arizona Counties Organization also observes that the 4FRI DEIS states that "most sites (allocated to old growth) currently do not fully meet the minimum criteria for old growth conditions as listed in the forest plans" (p. 15). Considering that the purpose of allocating acres to old growth forest is to manage these acres for the fastest possible growth of existing trees toward VSS 6, there is a high likelihood that mature large trees in VSS 5 may be thinned in order to reduce competition for VSS 6 candidates. This decision also involves personal interpretation and individual judgment calls which may prove socially acceptable or disastrous based on the individual making the decision.

Therefore, the Eastern Arizona Counties Organization is generally satisfied with the Old Trees Implementation Plan (OTIP) and old growth management objectives stated in the 4FRI DEIS, but remains concerned that its implementation may be a social license risk for the 4FRI DEIS.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible social license risk for the 4FRI DEIS potentially caused by a misguided implementation of the Old Trees Implementation Plan (OTIP), may present a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization respectfully suggests that the USFS 4FRI Team include strict and restrictive guidance regarding the possible removal of old growth, including a maximum number of trees removed according to appropriate metrics such as possibly: per 10 acre block, per mile, per project, or similar.

Large trees

Gap analysis

Large trees are particularly precious inasmuch as they represent the 'future old growth' necessary to restore the forests of eastern Arizona to an ecologically sustainable condition, and to provide habitat to dense and high canopy dependent species. The old growth 'allocation' requirement of 20% in the forest plan, as discussed in the previous section Old Growth, is a 'paper' allocation and should not be confused with the 'actual' old growth that exists in the lower single digit percentage across the forests, numerically far below the required 20% - or even 10% - and temporally far removed from reaching the required 20%. The deficit of actual vegetative structural stage (VSS) 6 Old Forest is what makes vegetative structural stage (VSS) 4 and 5 Mid-age Forest and Mature Forest important.

This reasoning guided the Eastern Arizona Counties Organization when it participated to the stakeholders development of the Old Growth Protection and Large Trees Retention Strategy (OGPLTRS) that the USFS 4FRI Team adapted into two documents: i) the Old Trees Implementation Plan (OTIP); and, ii) the Large Trees Implementation Plan (LTIP). The Old Trees Implementation Plan (LTIP) is discussed in the previous section Old Growth.

The purpose of the stakeholders' large trees retention strategy is to emphasize the retention of large trees (VSS 4 and 5) in order to re-establish the old growth necessary for the ecological sustainability of eastern Arizona forests. However, the large trees retention strategy also includes a series of exception mechanisms that codify the socially acceptable removal of large trees (VSS 4 and 5) with a diameter superior to 16" at breast height (d.b.h.), when their removal is necessary to achieve the ecological restoration objective, to increase heterogeneity, and/or to conserve biodiversity. The stakeholders' document also includes provisions for collaborative adaptive management and collaborative participation to propose decision content, while complying with the statutory retention of the decision making authority by the Responsible Official.

The Eastern Arizona Counties Organization is concerned that the adaptation of the stakeholders-developed large trees retention strategy by the USFS 4FRI Team into the Large Trees Implementation Plan (LTIP) i) does not fully reflect the intent of the stakeholders; and, ii) does not take advantage of the products of the 4FRI collaboration. Specifically:

1. The Forest Service determined that: "The original LTRS did not provide the ability to create regeneration openings using a group selection treatment method within the large, young tree and the within stand openings category" (DEIS p. 57). In so stating, the Forest Service apparently overlooks the fact that removal of individual large young trees is allowed under the exception mechanism, as required to meet the ecological restoration objective. The stakeholders' intent in constraining the removal of groups of large young trees is to allow the development of future old growth as required in the forest plans, including old growth groups.

2. The Forest Service further determined that: "this would result in a continued imbalance of size classes that would be contrary to the forest plan desired conditions" (DEIS p. 57). In so stating, the Forest Service fails to capitalize on the fact that the 4FRI DEIS already includes several forest plans amendments and that these amendments can address this issue as well. Further, the USFS 4FRI Team does not disclose at what scale the imbalance would occur. Imbalance at group level, or even possibly at stand level, becomes balance at larger scales as groups of VSS 5 future old growth balance large areas devoid of them.

3. The Forest Service also determined that: "The original LTRS would have required the Forest Service to consult with stakeholders should a new exception category be found during implementation (LTRS, page 25). To resolve the potential for Federal Advisory Committee Act (FACA) violations, this consultation requirement was removed" (DEIS p. 57). In so stating, the Forest Service misses an opportunity to take advantage of the MOU signed between the USFS and the stakeholders to address specifically such issues through collaboration incompliance with FACA.

Therefore, the Eastern Arizona Counties Organization is concerned that the adaptation of the stakeholders-developed large trees retention strategy by the USFS 4FRI Team into the Large Trees Implementation Plan (LTIP) is likely to be a significant social license risk for the 4FRI DEIS, and that the risk / benefits analysis of the social license risk vs. the restoration benefits may be unfavorable to 4FRI.

Consequently, the Eastern Arizona Counties Organization is concerned that the social license risk for the 4FRI DEIS likely caused by the adaptation of the stakeholders-developed large trees retention strategy by the USFS 4FRI Team into the Large Trees Implementation Plan (LTIP), presents a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization respectfully suggests that the USFS 4FRI Team provide a clear and compelling analysis:

1. Presenting at what scale the inability to create regeneration openings using a group selection treatment method within the large, young tree and the within stand openings categories would result in a continued imbalance of size classes;

2. Presenting a collaborative process that would allow the USFS Responsible Officials to comply with the FACA requirements while implementing stakeholders supported adaptive management in case a new exception category would be needed during implementation; and,

3. Presenting language for expanding the amendments plans, if actually necessary, should a multiple scale analysis not address the issue of continued imbalance of size classes.

Prioritization

Gap analysis

The Eastern Arizona Counties Organization observes that there are only a mere 5 instances of the word "prioritization" in the 744 page 4FRI DEIS. ECO further observes that none of these instances apply to the discussion of the concept of treatments prioritization, for the obvious reason that there is no discussion of treatments prioritization in the 4FRI DEIS, including in Appendix D Alternative B through D Implementation Plan, or in the specialist reports or in the project record.

The Eastern Arizona Counties Organization also observes that Appendix D Alternative B through D Implementation Plan contains no discussion of timing or sequencing of treatments and that the concept of 'Implementation Plan' seems interpreted in the 4FRI DEIS as 'guidelines to implement' rather than 'action plan to implement' or 'work plan to implement.' ECO certainly realizes that minute details of implementation are not a NEPA concern but a contracting management concern. However, ECO also posits that the implementation of a management action as far reaching in scope and temporal and geographical scale as 4FRI, requires a discussion of timing and sequencing, inasmuch as timing and sequencing of treatments are of a nature to potentially impact significantly the site specific effects of individual treatments and the collective cumulated effects of the treatments (understood as the effects of the cumulated treatments within 4FRI, as opposed to the NEPA understanding of cumulative effect of the 4FRI treatments plus other projects).

Further, the concept of 'Strategic Placement' of the treatments, in relation to values to be protected, dominant winds, modeled fire behaviors, etc., is critical in the determination of what treatments are most appropriate, how many treatments are required, what treatment intensities are required, and what is the best distribution between treatment types (mechanical vs. fire).

The 4FRI stakeholders worked extensively to produce the Landscape Restoration Strategy for the First Analysis Area (2010) that addressed in detail the concept of geographical and temporal

prioritization. This work was further refined with the participation of the USFS 4FRI Team into a classification of High Resource Values (HRVs) and Medium Resource Values (MRVs). Some elements of this work were utilized by the USFS 4FRI Team in the 4FRI analysis process, but the discussion of strategic placement; geographical and temporal prioritization; and, their impact on: number, type, intensity, individual and cumulated effects of treatments, is missing.

The Eastern Arizona Counties Organization is not inferring the need to re-analyze the location of the treatments. ECO is generally satisfied with the map of treatments location. Rather, ECO is suggesting the need to integrate in the NEPA analysis when and in what order the treatments already identified spatially will take place, as timing and sequencing have a direct impact on the number, type, intensity and effects of treatments.

The Eastern Arizona Counties Organization is not inferring the need to re-analyze the location of the treatments. ECO is generally satisfied with the map of treatments location. However, because the timely implementation of the restoration treatments is critical to meeting the purpose and needs of the proposed action, ECO is concerned that the spatial and temporal sequencing of the treatments may have a significant effect on: i) whether the purpose and needs will be met; and, ii) the number, type, intensity, and individual and cumulated effects of the treatments required to meet the purpose and needs. Consequently, the absence in the 4FRI DEIS of spatial and temporal strategic timing and sequencing of the treatments, and integration of the influence of spatial and temporal prioritization of the treatments on the number, type, intensity, and individual and cumulated effects of treatments, may present a process risk for the 4FRI EIS.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible process risk for the 4FRI DEIS potentially caused by the absence of a discussion of strategic placement, spatial and temporal prioritization, and their influence on the number, type, intensity, and individual and cumulated effects of treatments, presents a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization respectfully suggests that the USFS 4FRI Team provide a clear and compelling analysis:

1. Presenting a temporal prioritization of the treatments and a sequenced timeline of implementation for the treatment of 30,000 acres annually over the 10 year life of the 4FRI project;

2. Presenting a spatial prioritization of the treatments and the sequenced locations of the treatments, for the treatment of 30,000 acres annually over the 10 year life of the 4FRI project; and,

3. Presenting how the temporal and spatial prioritization affect the number of treatments, type of treatments, intensity of treatments, direct, indirect, site specific, and cumulated effects of the treatments.

Fire modeling

Gap analysis

Fire behavior modeling is a critical part of the 4FRI site specific and cumulative analysis process, and the Eastern Arizona Counties Organization appreciates the fact that a major effort was made along the entire 4FRI analysis process, starting well before the DEIS, or even the Proposed

Action, to model the cumulative effects of landscape scale restoration treatments on fire behavior. To ECO, post-treatments and long term future desired conditions fire behaviors represent much of the 'end game' in 4FRI, as the restoration of a natural regime of regular cool surface fires is fundamental to the long term ecological sustainability of the forests of eastern Arizona.

Probably as a consequence of the fact that the 4FRI DEIS does not include a specific treatments implementation plan including timing, prioritization and sequencing of treatments in Appendix D Alternative B through D Implementation Plan (see section Prioritization here above), the fire behavior modeling in the 4FRI DEIS only provides a theoretical modeling based on the unrealistic premise that all treatments would happen simultaneously. This is unfortunate because the fire behavior modeling cannot include accurate canopy characteristics (base height, bulk density and cover) or surface fuel loading for any given large area at any given point in time as a result of some treatments being implemented; some treatments not being implemented yet, with fuel load further increasing and canopy characteristics further degrading; and, some treatments having been implemented, possibly as earlier as a decade earlier, with canopy and fuel loading characteristics at various stages of regrowth.

Accordingly, the Eastern Arizona Counties Organization is concerned that post-treatment fire behavior as modeled may not represent reality, and that the analysis of the cumulated effects of the treatments (understood as the effects of the cumulated treatments within 4FRI, as opposed to the NEPA understanding of cumulative effect of the 4FRI treatments plus other projects) may be tainted.

Therefore, the Eastern Arizona Counties Organization is concerned that the modeling of the fire behavior effects of the treatments based on the assumption that all treatments are performed simultaneously, due to the lack of timing and sequencing of the treatments, may present a process risk for the 4FRI DEIS.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible process risk for the 4FRI DEIS potentially caused by the modeling of the fire behavior effects of the treatments based on the assumption that all treatments are performed simultaneously, presents a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization respectfully suggests that subsequent to the completion of an analysis presenting a temporal and spatial prioritization of the treatments, the USFS 4FRI Team provide a clear and compelling analysis of the effects of the treatments on fire behavior, presenting

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annual or bi-annual fire behavior modeling based on the outcome of the progressive implementation of 30,000 acres of restoration treatments annually over the 10 year life of the 4FRI project, and that the impact of this analysis be integrated in the analysis of the number, type and intensity of treatments required to meet the purpose and needs, and the direct, indirect, site specific, and cumulated effects of the treatments.

Watersheds

Compatibility analysis

The ponderosa pine vegetation type in the 4FRI DEIS analysis area is dominated by Class 2 functional at-risk 6th level Hydrologic Unit Code (HUC) watersheds on about 451,500 acres or 46 % of the analysis area. Class 3 impaired watersheds represent about 316,800 acres, or about 32 % of the analysis area. Class 1 properly functioning watersheds represent about 220,400 acres, or about 22 % of the analysis area (DEIS p. 107).

Per the Specialist report, and as summarized in the 4FRI DEIS, the 4FRI restoration treatments under Alternative B (the Proposed Action) and Alternative C (the Preferred Alternative) are expected to result in an improvement in 23% of Class 2 functioning at-risk watersheds (~104,000 acres), and 42% of Class 3 impaired watersheds (~133,000 acres), with 28 miles of improved water flow regimes overall, including 19 miles in Class 2 watersheds that are functioning at risk and 9 miles in Class 3 watersheds currently impaired (DEIS p. 114).

The Eastern Arizona Counties Organization is generally satisfied that the effects of the 4FRI restoration treatments under Alternative B and Alternative C contribute significantly toward the ECO Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization encourages the USFS 4FRI Team to prioritize wherever and whenever possible restoration and catastrophic fire prevention treatments in the watersheds, after the direct protection of communities and infrastructures.

Continuity between the USFS 4FRI Team work, the 4FRI project record, and the 4FRI DEIS

Gap analysis

During its participation in the DEIS Review Workgroup of the 4FRI Stakeholders Group, and the associated work with the USFS 4FRI Team, the Eastern Arizona Counties Organization observed that site specific information can be virtually impossible to access by anyone not deeply immersed with or, for all practical purposes, not a member of the USFS 4FRI Team. Additionally, the site specificity verification process revealed that some of the required Geographic Information System (GIS) data tables or layers were not entered into the official project record.

Therefore, the Eastern Arizona Counties Organization is concerned that the integrity or completeness of the official project record as required under NEPA may be compromised by the accidental omission of technical data and may present a process risk for the 4FRI DEIS.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible process risk for the 4FRI DEIS potentially caused by the fact that the integrity or completeness of the official project record as required under NEPA may be compromised by the accidental omission of technical data, presents a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization respectfully suggests that the USFS 4FRI Team conduct a systemic and systematic review of all technical data, GIS or other, used in their analysis, and ensures that it is included in the 4FRI project record. ECO further suggests that the USFS 4FRI Team use the same methodology of random sampling as used by the DEIS Review

Workgroup of the 4FRI Stakeholders Group to statistically verify that all required data is included in the project record.

Site specificity

Compatibility analysis

During its participation in the DEIS Review Workgroup of the 4FRI Stakeholders Group, and the associated work with the USFS 4FRI Team, the Eastern Arizona Counties Organization verified to its satisfaction that the required site specificity as regards current condition, desired future condition, prescribed treatment, and site specific effects has been provided in the USFS 4FRI Team analysis process.

However, as stated in the above section Continuity between the USFS 4FRI Team work, the 4FRI project record, and the 4FRI DEIS, the site specificity verification process with the USFS 4FRI Team evidenced to both ECO and the USFS 4FRI Team that site specific information can be virtually impossible to access by anyone not deeply immersed with or, for all practical purposes, not a member of the USFS 4FRI Team.

Therefore, the Eastern Arizona Counties Organization is concerned that the difficulty to access site specificity information may present a process risk for the 4FRI DEIS.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible process risk for the 4FRI DEIS potentially caused by the difficulty to access site specificity information, presents a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

As discussed with the USFS 4FRI Team, the Eastern Arizona Counties Organization respectfully suggests that the interactive map presented on the 4FRI DEIS website be developed to allow easy 'point and click' access to site specific information such as, but not limited to, current condition, desired future condition, prescribed treatment, site specific direct and indirect effects, and contribution to cumulative effects, as well as all the technical information regarding all relevant resources as can be conveniently provided.

Alternatively, if technical or resource constraints preclude the USFS 4FRI Team to develop the above suggested interactive map, or to make it available to the public, the Eastern Arizona Counties Organization respectfully suggests that a 'point and click' function could provide information on how to procure the desired site specific data from the project record.

Cumulative effects

Gap analysis

Appendix F Cumulative Effects includes a comprehensive list of the past, current and reasonably foreseeable future projects and disturbances included in the cumulative analysis. These projects and disturbances include vegetation projects (mechanical thinning and prescribed fires); recreation projects; other projects; wildfires; insect and disease outbreaks; and, a short discussion of reasonably foreseeable projects with insufficient information for analysis. The list includes projects located on private, State, national forests and other federally managed lands that lie within, adjacent to and outside of the project area. Appendix F Cumulative Effects does not include a discussion of what the cumulative effects of all the projects are, and only includes a brief synopsis of Authorized Livestock Management; Timber Harvest; and, Post-1996 Vegetation

Treatments – Uneven-aged Management, Fire Risk, Restoration summarized from the Specialists' reports.

Chapter 3 Affected Environment and Environmental Consequences addresses extensively the concept of cumulative effects on Soils and Watershed; Vegetation; Fire Ecology; Air Quality; Terrestrial and Semiaquatic Wildlife and Plants; Aquatics; Noxious and Invasive Weeds; Heritage Resources; Tribal Relations; Socioeconomics; Recreation; Lands and Minerals; Scenery; Range; and, Transportation.

However, the format used to discuss the cumulative effects varies considerably from resource to resource. For example, the Soils and Watershed (DEIS p.105-121) and the Terrestrial and Semiaquatic Wildlife and Plants (DEIS p.173-245) sections include fairly comprehensive descriptions of the cumulative effects and of their rationale. Other sections formulate cumulative effects as opinions, or as summary statements that essentially posit that the past or current projects have achieved or are achieving their stated objectives.

The Cumulative Effects section itself of Chapter 3 is but a two sentence paragraph that states: "A summary of past, present, and reasonably foreseeable management actions and natural disturbances that were evaluated by most resources is located in appendix F. See the project record for the comprehensive master list of all projects and for additional information on each project" (DEIS p. 331).

The Eastern Arizona Counties Organization is generally satisfied that the list of projects considered in the cumulative effect analysis is appropriate, with one notable exception. Since the completion of the 4FRI DEIS, the Flagstaff Watershed Protection Project Proposed Action (PA) has been released (April 2013) and will need to be integrated into the cumulative analysis in the final EIS.

The Eastern Arizona Counties Organization is generally satisfied that the resource specialists have conducted some form of cumulative effects analysis, and ECO realizes that the cumulative effect analysis methodology cannot be identical across resources. However, ECO is concerned that the methodologies for cumulative effects analysis are generally not satisfactorily explained, and may be inconsistent in depth and breadth across resources. ECO is further concerned that the issue of continuity between the project record, the specialists reports, and the DEIS - already identified regarding site specific effects -may also exist regarding cumulative effects.

Therefore, the Eastern Arizona Counties Organization is concerned that potential inconsistencies across resources in the depth, breadth and presentation of the methodologies used for cumulative effects analysis may present a process risk for the 4FRI DEIS.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible process risk for the 4FRI DEIS potentially caused by potential inconsistencies across resources in the depth, breadth and presentation of the methodologies used for cumulative effects analysis, presents a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization respectfully suggests that the USFS 4FRI Team include the Flagstaff Watershed Protection Project Proposed Action (April 2013) in the cumulative analysis in the final EIS.

The Eastern Arizona Counties Organization further respectfully suggests that each resource section of Chapter 3 Affected Environment and Environmental Consequences include a methodology subsection describing the methodology used for cumulative effects analysis. ECO also suggests that the USFS 4FRI Team review methodologies across resources to ensure consistency of depth and breadth of cumulative effects analysis.

Monitoring

Gap analysis

Appendix E Alternative B through D Monitoring and Adaptive Management Plan offers brief one or two sentence descriptions of: types of monitoring (ecological, implementation, effectiveness, validation and Collaborative Forest Landscape Restoration Act (CFLRA)); monitoring prioritization, scales, question and indicators; and, a ten line description of adaptive management. Appendix E also includes Table 143 Implementation monitoring questions, indicators, frequency of measurement, data source, and cost; Table 144 Landscape-scale effectiveness desired conditions, indicators, frequency of measurement, data source, and cost; and, Table 145 Effectiveness monitoring plan.

However, the Eastern Arizona Counties Organization observes that about half of Table 143 Implementation Monitoring is left blank, and for most questions for which the table is not blank, the indicators are crude and the frequency is minimal (typically: annual acres and miles). Table 143 looks more like an annual budgetary reporting table than a project implementation monitoring plan. The quantitative aspect of implementation monitoring seems addressed but the qualitative aspect of implementation monitoring seems largely unaddressed or unanswered. It is surprising that half the table is incomplete, indicating an unfinished product.

The Eastern Arizona Counties Organization also observes that Table 142 Monitoring scales, is left incomplete inasmuch as it does not include any monitoring scale below the sub-unit for the 4FRI DEIS. This, too, indicates an unfinished product. Further, there appears to be a gap in the effectiveness monitoring plan inasmuch as most of the treatments focus on achieving treatments objectives and desired conditions at the stand or even group level, while most of the effectiveness monitoring appears to be planned at the landscape scale.

The Eastern Arizona Counties Organization further observes that Table 144 Landscape-scale Effectiveness offers a fairly comprehensive list of desired future conditions: Conservation of Biological Diversity; Ecosystem Resilience; Water and Air Resources; Economics; Social Systems; and, Heritage Resources. However, the indicators listed are macro level indicators and the frequency of measurement is generally annually or every 5 years, and many sections of the table in the “Data Source/Spatial Scale/Cost” column indicate “No numbers provided.” This further indicates an unfinished product.

The Eastern Arizona Counties Organization also observes that Table 145 Effectiveness Monitoring Plan actually seems to be more of an adaptive management decision matrix than an effectiveness monitoring plan. Adaptive management is addressed in the following section Adaptive Management.

The Eastern Arizona Counties Organization is concerned that the 4FRI DEIS, the Specialists reports and the project record do not include a specific ‘action plan’ or ‘work plan’ and budget, or funding mechanisms, for the monitoring plan. Although the question of who will monitor, and potential funding sources, are nominally mentioned in Table 141 Monitoring plan tiers, the scale, scope and complexity of 4FRI require addressing these questions in a comprehensive fashion that

goes well beyond a passing mention in Table 141. How many man-hours will the implementation of the monitoring plan require? Who will provide these man-hours? How much will it cost? How will it be funded? What are the quality control mechanisms to ensure that monitoring itself - if provided by volunteer (amateur?) third parties - meets required criteria? What mechanisms exist to ensure the integrity of the measures?

Further, the reliance on “stakeholders” and “multiparty (monitoring boards)” in the 4FRI DEIS monitoring plan tiers (Table 141, DEIS p. 660) raises questions which are left unanswered regarding the functioning of the monitoring plan. For example: What is the USFS mechanism to utilize third party developed monitoring data to make agency action adaptive management decisions? What are the mechanisms to deal with adaptive management decisions that may be of a nature to significantly alter the management actions identified in the Record of Decision? Etc.

The Eastern Arizona Counties Organization is further concerned that the ability of the public to review and comment on the 4FRI monitoring ‘action plan’ or ‘work plan’ and budget has been compromised inasmuch as even if the USFS 4FRI Team develops such a plan and budget as an outcome of the comments process, the plan will not be available for public review and comments until a notice of decision is published, unless the USFS 4FRI Team decides to release a second 4FRI Draft EIS (DEIS) or a Supplemental EIS (SEIS). Considering that the 4FRI monitoring ‘action plan’ or ‘work plan’ and budget currently do not exist, it is not possible to submit substantive comments on them and, therefore, a potential objection could be ineligible based on 51.52 - Issues Not Based on Previously Submitted Substantive Formal Comments.

In contrast, the current Forest Service Manual requirements for Plan Monitoring Program Design (Sec. 1921.51) are extremely specific:

“In designing the plan monitoring program, the Responsible Official:

1. Should consider ongoing project and activity monitoring.

2. Should establish and apply a screening process (FSH 1909.12, section 12.1) to ensure that only feasible and meaningful monitoring activities are conducted, and in a manner that is practical and affordable.

3. Should store and manage monitoring data in corporate applications such as Natural Resource Information System whenever the capability exists.

4. Should develop a multi-year monitoring guide that describes protocols, databases, and a monitoring schedule.

5. Shall develop an annual monitoring action or work plan to identify the specific monitoring tasks to be accomplished and the budget and personnel associated with those tasks.”

The Eastern Arizona Counties Organization fully understands that Sec. 1921.51 was initially written to apply at Forest Plan level, and that the 4FRI DEIS is nested at project level within the Coconino and Kaibab forest plans. However, CEQ has made very clear that when mitigation is involved in the NEPA analysis – such as the adaptive management mechanism integrated within the 4FRI DEIS – monitoring is automatically invoked.

Therefore, the Eastern Arizona Counties Organization is concerned that the 4FRI Monitoring Plan may fail to comply with the requirements of Forest Service Manual Sec. 1921.51 in general, and with subsections 4) and 5) in particular; that the ability of the public to review and comment on

the 4FRI monitoring action or work plan may have been compromised; and, therefore, the 4FRI Monitoring Plan may present a process risk for the 4FRI DEIS.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible process risk for the 4FRI DEIS potentially caused by the fact that the 4FRI Monitoring Plan may fail to comply with the requirements of Forest Service Manual Sec. 1921.51 in general, and with subsections 4) and 5) in particular, and that the ability of the public to review and comment on the 4FRI monitoring action or work plan may have been compromised, presents a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

Monitoring 'action plan' or 'work plan'

The Eastern Arizona Counties Organization respectfully suggests that the USFS 4FRI Team include in very specific terms: i) quantitative, qualitative and effectiveness monitoring processes; ii) a monitoring 'action plan' or 'work plan' and budget; and, iii) the resources allocation and funding necessary to implement monitoring in the 4FRI DEIS, to ensure that the monitoring of the 4FRI project implementation is quantifiably and qualitatively implemented.

Practically, the Eastern Arizona Counties Organization suggests a three step monitoring process articulated as follows:

1) Quantitative implementation compliance monitoring.

The purpose of the quantitative implementation compliance monitoring is to answer the question: "Was the job done?" While, generally, this assessment is made by the Forest Service contract management team when a contractor is involved, it is suggested that this step becomes the beginning of the process rather than what is often the end of it.

Specific quantitative implementation compliance monitoring measures can be defined at the planning stage and specific resources requirements can be calculated at the planning stage. The 'action plan' or 'work plan' must include, disclose and commit the Responsible Officials to provide the resources and budget required.

2) Qualitative implementation compliance monitoring.

The purpose of the qualitative implementation compliance monitoring is to answer the question: "Was the job done correctly?" The need for qualitative implementation monitoring increases rapidly with the complexity of the actions undertaken. Complex forest restoration prescriptions implemented using designation by description (DxD) or designation by prescription (DxP) create substantial room for interpretation by the operators, and may result in outcomes substantially different on the ground from those intended by the resources specialists who wrote the prescriptions. Verifying that implementation complies not only quantitatively but qualitatively with the management decision is especially important when the third step of monitoring is intended, as effectiveness can only be meaningfully analyzed if the actual treatments outcomes are in compliance with the intended outcomes.

Specific qualitative implementation compliance monitoring measures can be defined at the planning stage and specific resources requirements can be calculated at the planning stage. The 'action plan' or 'work plan' must include, disclose and commit the Responsible Officials to provide the resources and budget required.

3) Multi-tier and multiple scales effectiveness monitoring.

The purpose of the effectiveness monitoring is to answer the question: "Do the outcomes of the management decision produce the intended effects?" The need for effectiveness monitoring increases rapidly with the complexity and spatial and temporal scopes of the management actions undertaken, especially in projects where cumulative effects analysis assumes a speculative nature owing to the scale and duration of the management actions. Landscape scale forest restoration over 2 million acres in 20 years, as endeavored in the 4FRI project, is largely inconceivable without the concept of adaptive management. However, adaptive management is but an empty rhetoric, and any management action and the NEPA analysis thereof is flawed, if robust three step monitoring as described here above is not planned and implemented.

Specific effectiveness monitoring processes can be defined at the planning stage and specific resources requirements can be calculated at the planning stage. The 'action plan' or 'work plan' must include, disclose and commit the Responsible Officials to provide the resources and budget required.

A three functional steps monitoring process articulated as above can be easily adapted to the three priority tiers identified in the 4FRI stakeholders suggested monitoring plan (2012) and the three monitoring scales identified in Appendix E Alternative B through D Monitoring and Adaptive Management Plan (DEIS p. 660). In presenting the above monitoring process, the Eastern Arizona Counties Organization does not intend to propose an alternative to the stakeholders developed Biophysical and Socioeconomic Monitoring for the desired conditions of the Four Forest Restoration Initiative plan, but to suggest a framework for the associated monitoring 'action plan' or 'work plan' and budget required under FSM Sec. 1921.51 (4) & (5).

Multi-party monitoring

The Eastern Arizona Counties Organization respectfully suggests that the 4FRI DEIS include in very specific terms the requirements for the Responsible Officials to be bound by the findings of multi-party monitoring boards. It is not suggested here that responsible officials surrender their decision making authority to a multi-party monitoring board, or violates the requirements of FACA, but that they should be required to act upon the findings of a multi-party monitoring board in a manner that appropriately addresses the issues raised.

Adaptive management

Gap analysis

The Eastern Arizona Counties Organization observes that the words 'adaptive management' are used in 61 distinct instances throughout the 4FRI DEIS, and that adaptive management is referred to, throughout the entire 4FRI DEIS, as an integral part of the 4FRI project and as a management tool fully integrated in the 4FRI NEPA process. ECO applauds the commitment of the USFS 4FRI Team to adaptive management, as projects on the scale of 4FRI (~2 million acres in 20 years), or even the first DEIS of 4FRI (~1 million acres in 10 years), where direct, indirect and cumulative effects analysis assumes a speculative nature owing to the scale and duration of the management actions, are largely inconceivable without the concept of adaptive management.

However, the Eastern Arizona Counties Organization observes that aside from a five line description in the Glossary (DEIS p. 341), and a nine line general description in the Appendix E Alternative B through D Monitoring and Adaptive Management Plan (DEIS p. 661-662), there is no presentation or description in the 4FRI DEIS, the specialists reports or the project record, of the adaptive management process. The entire adaptive management plan for the 4FRI project is described as follows: "Monitoring of alternative management actions provides the data for the

adaptive management process. As a result of comparing monitoring results to the predicted outcomes, the plan provides a roadmap for adjusting actions or applying new science as long as the anticipated effects are within the scope of impacts analyzed and disclosed in the EIS and record of decision" (DEIS p. 661-662).

The fundamental issues of characterization of system uncertainty through multi-model inference; definition of temporal and spatial scales; indicators selection; analysis, modeling, and conclusiveness of quantitative, qualitative and effectiveness multi-tier and multiple-scale monitoring data; identification of thresholds; evaluation of strategic alternatives; amplitude, timing, scale and iteration of corrective actions; etc., are left untouched.

Additionally, as mentioned in the above section Monitoring, the Eastern Arizona Counties Organization also observes that Table 145 Effectiveness Monitoring Plan actually seems to be more an attempt at an adaptive management decision matrix rather than an effectiveness monitoring plan per se. The table includes some indicators, triggers, and adaptive actions based on landscape scale desired conditions, but many adaptive actions applying to macro level desired conditions are "discontinue" or "prohibit until alternative approach is development (sic)" or "increase" or "re-evaluate". These are binary or vague. In addition, many of the triggers timelines are 5 or even 10 years long, which may be adapted for some resources, but may not allow, for other resources, the identification of trends, and the implementation of adaptive management actions before the entire 4FRI project, or half of it, is completed.

Similarly, the few lines of adaptive management narrative are vague and general: "Some of the effectiveness monitoring objectives have adaptive management actions that would be taken if the established thresholds are reached or exceeded. Alternatives B, C, and D have specific adaptive management actions for springs, channels, and roads that have been made part of the alternative (see DEIS chapter 2)" (DEIS p. 662).

The Eastern Arizona Counties Organization is concerned that adaptive management is only a concept at this stage; that the specialized techniques and processes of adaptive management may not be fully grasped; and that adaptive management has not been truly engineered into the 4FRI project as an executable management mechanism integral to the 10 year implementation of the 4FRI EIS over one million acres.

Further, the Eastern Arizona Counties Organization is concerned by the reaction to date of the USFS 4FRI Team to such observations: "Adaptive management is not a NEPA requirement." ECO is concerned that, while it is correct that adaptive management is indeed not a NEPA requirement in the 1982 Planning Rule, it has become one under the 2012 Planning Rule (Forest Service Handbook FSH 1909.12 – 41). Maybe more importantly, ECO is concerned that by making adaptive management a key process of the 4FRI NEPA analysis, the USFS 4FRI Team has in effect constrained itself into designing and implementing a true adaptive management process.

Therefore, the Eastern Arizona Counties Organization is concerned that the absence of a robust adaptive management process, despite the stated reliance on adaptive management to implement restoration treatments on one million acres over 10 years, may present a process risk for the 4FRI DEIS.

Consequently, the Eastern Arizona Counties Organization is concerned that the possible process risk for the 4FRI DEIS potentially caused by the absence of a structured adaptive management plan, presents a consistency gap between the 4FRI DEIS and the Counties' objectives as expressed in their plans and policies and in these comments.

Suggested action

The Eastern Arizona Counties Organization respectfully suggests that the USFS 4FRI Team develop and include in the 4FRI EIS a robust adaptive management plan that includes standardized processes such as:

- Characterization of system uncertainty through multi-model inference;
- Definition of temporal and spatial scales;
- Analysis of indicators selection;
- Analysis, modeling, and conclusiveness of quantitative, qualitative and effectiveness multi-tier and multiple-scale monitoring data;
- Analysis of thresholds;
- Analysis of strategic alternatives; and,
- Analysis of amplitude, timing, scale and iteration of corrective actions.

Planning Process Issues

In its review of the proposed directives revising the Forest Service Handbook (FSH 1909.12) and the Forest Service Manual (FSM 1920), and establishing procedures and responsibilities for implementing the 2012 National Forest System Land Management Planning Regulation set out at 36 CFR part 219, the Eastern Arizona Counties Organization identified issues and shortcomings that are likely to affect the 4FRI DEIS.

The Eastern Arizona Counties Organization fully understands that the opportunity to comment on the 4FRI DEIS is neither an opportunity to comment on the 2012 Planning Rule, nor on its implementation directives. Nonetheless, precisely because the 4FRI DEIS will establish the parameters for all subsequent management actions in the 4FRI project for the upcoming 10 years or more, ECO believes that it is appropriate for the 4FRI EIS to specifically include and, therefore, integrate into any subsequent management action, guidelines on: i) how to use of best available scientific information to inform the land management planning process; ii) public participation and the role of collaboration; and, iii) the objection process.

Use of Best Available Scientific Information to Inform the Land Management Planning Process

The Eastern Arizona Counties Organization appreciates and supports the important role given to the use of best available scientific information to inform the land management planning process in the proposed directives and in the 4FRI DEIS.

The Eastern Arizona Counties Organization further appreciates and supports the important role given to assessing social and economic sustainability and multiple uses in the assessment process.

Issue

However, the Eastern Arizona Counties Organization believes that the proposed directives miss a critical opportunity to provide substantially clear directives to responsible officials in actually integrating social and economic sustainability and multiple uses, and in integrating social and economic science to the framework of best available scientific information to inform their land management planning process, and their management decision making process. Specifically, the assessment of the social, cultural and economic values becomes essentially an exercise in futility

if these values are not reflected in the management decisions, and do not balance other values. This lacking is reflected in the 4FRI DEIS.

The Eastern Arizona Counties Organization clearly supports robust science and the full integration of ecological, bio diversity, restoration and conservation values in the management process, and ECO is on record for participating in, and often leading, efforts designed to re-introduce to the ecosystems of eastern Arizona natural ecologically sustainable processes such as a frequent cool surface fire regime. Nevertheless, ECO is observing, and when necessary is committed to mitigate, a tendency to develop and implement pure, uncompromised and uncompromising science, or the currently accepted state of best science - which often proves to be a temporary state, to the detriment of the enjoyment, custom, culture, health, safety and economic well-being of the people.

Additionally, the Eastern Arizona Counties Organization is also observing, and when necessary is also committed to mitigate, the fact that the same temptation to develop and implement pure, uncompromised and uncompromising science, also often causes the weakening of the social consensus with stakeholders who would support the implementation of management decisions based on a balanced approach, but are unwilling to support the invasive implementation of a monolithic and intransigent interpretation of science. For example, many stakeholders are reluctant to support unconditionally the 4FRI DEIS, owing to the science-based decision to cut some of the large trees necessary for the development of the future old growth, in order to create regeneration openings in the name of scientifically driven silviculture. Such decisions may make sense at group level, in forests featuring well balanced classes of vegetative structural stages (VSS), but are difficult to support at stand level or forest level in forests where older VSS classes (VSS 5 and 6) are in recognized deficit at landscape scale, while younger VSS classes (VSS 2, 3 and 4) are overabundant, choke the landscape, and transform it into a ticking fire bomb.

Suggested action

The Eastern Arizona Counties Organization suggests that the 4FRI EIS provide clear and unambiguous guidelines to responsible officials to integrate social sustainability and social science into the framework of best available scientific information to inform their management decision making process.

Specifically, the Eastern Arizona Counties Organization suggests that the 4FRI EIS guide responsible officials to implement substantive - even though possibly scientifically imperfect - management actions that move the ecosystems significantly toward the desired future conditions, when such actions are supported by social consensus, rather than spend years attempting to forcibly impose management actions that may be deemed scientifically more perfect but that do not benefit from the support of the social consensus. In other words, ECO suggests that the 4FRI EIS emphasize executing well less than perfect projects now, over developing scientifically perfect projects that are not implemented.

To quote a famous Arizonan: “Extremism in the defense of liberty is no vice” (Barry Goldwater), but the Eastern Arizona Counties Organization would like to propose to the USFS 4FRI Team that extremism in the pursuit of best available scientific information (BASI) may become counterproductive when it results in paralysis by analysis, or inaction by litigation.

Public Participation and the Role of Collaboration

The Eastern Arizona Counties Organization appreciates and supports the important role given to public participation and the role of collaboration in the proposed directives and in the 4FRI DEIS.

Issue

However, the Eastern Arizona Counties Organization believes that the proposed directives miss a critical opportunity to provide substantially clear directives to responsible officials on two fundamental and overlapping aspects of public participation and the role of collaboration. Specifically: i) sustained and meaningful public participation and engagement require that the public's input actually influence substantially the decision making process; and, ii) sustained and meaningful collaboration requires that the products of collaboration be honored by the Forest Service. This lacking is reflected in the 4FRI DEIS.

The Eastern Arizona Counties Organization has acquired a long, ineffective, inefficient, unproductive and oftentimes frustrating experience of responsible officials paying lip service to public participation and to the role of collaboration, and ECO believes that the 4FRI EIS must focus the concept of public participation and collaboration away from complying with a process and 'managing the problem,' toward developing executable products and 'resolving the problem.'

Suggested action

The Eastern Arizona Counties Organization recognizes that under current federal statutes Forest Service line officers are not allowed to share their decision making authority. Nonetheless, ECO believes that a statutory monopoly of decision making authority does not necessarily imply an operational monopoly on decision content. Therefore, ECO suggests that the 4FRI EIS emphasize that while the line officers retain their sole legal ability to make the decision, they are also required by law and regulation "to meet the needs of present and future generations" (Forest Service Mission Statement), as expressed through true public participation and collaboration, and meaningful consistency reviews with the local governments' objectives, among other channels.

The Eastern Arizona Counties Organization further suggests that the 4FRI EIS guide responsible officials in retaining their legal decision making authority while allowing the public to participate meaningfully in, influence substantially, and, when appropriate, contribute to alter the content of their decision.

Objection Process

The Eastern Arizona Counties Organization appreciates the attempt made by the Forest Service to: i) allow the public a more effective involvement; ii) support the collaborative processes; and, iii) develop better decision-making (U.S. Forest Service Chief Tom Tidwell) by replacing the previous appeal process with the new pre-decisional administrative review, or "objection process", to be applied under federal regulation to all projects and activities that implement land-management plans and that are documented in an environmental assessment or environmental impact statement.

The Eastern Arizona Counties Organization acknowledges that the U.S. Forest Service announced on March 26, 2013 the final rule governing the objection process for projects and activities implementing land-management plans, and that the final rule was published in the Federal Register on March 27, 2013 after a review of public comments submitted in response to the publication of the proposed rule in 2012. Consequently, ECO fully understands that this comments letter is not an opportunity to comment on the objection process.

Issue

However, the Eastern Arizona Counties Organization believes that the recent decision made by the Forest Service to replace the previous appeal process with the new objection process in the

4FRI NEPA process does provide an opportunity to address concerns about the objection process implementation, as follows.

Among other significant differences, a critical difference between the previous appeal process and the new objection process is that an objection must be filed prior to an actual decision being made and published. This creates a potentially difficult situation inasmuch as there is a possibility, and in certain cases a probability, that several objections may be filed by several different parties, and that the resolution of these objections may result in a final decision significantly different from the one disclosed in the document published with the notice of a plan subject to objection.

Although the list of objections will be public, the timing of filing of potential objections within the objections filing period may result in the requirement for the public to decide to file, or to abstain to file an objection based on the speculation of what other parties may decide to file, and what the resolutions to such objections might be. Additionally, since a final decision may be influenced significantly by the resolution of an objection that, by definition, happens only after the comments period is closed, parties may be unwillingly put in a situation where, per 51.52 - Issues Not Based on Previously Submitted Substantive Formal Comments, their potential objection may be ineligible.

Additionally, the Eastern Arizona Counties Organization is concerned that Chapter 50 Objection Process in general, section 51.66 - Reviewing Officer Response to Objections and section 51.6 - Resolution of Objections in particular, and specifically section 51.6 paragraph 4: “The reviewing officer responds to the outstanding issues in the objection; The reviewing officer’s response may include instructions to the responsible official as part of the disposition of the objection. The response must be sent to the objecting party(ies) by certified mail, return receipt requested, and posted online” (36 CFR 219.57(b) and sec. 51.64) are focused on the administrative process of disposing of an objection, rather than on the substantial process of actually resolving it.

Suggested action

The Eastern Arizona Counties Organization suggests that the 4FRI EIS guide the reviewing officers to exercise careful judgment in their resolution or rejection of objections, in relation to the true material importance of the objections – as opposed to their symbolic or emotional importance, and the potential effect of litigation on the implementation of the project. ECO suggests that a careful and dispassionate costs / benefits analysis be conducted between the minor ecological or silviculture costs possibly attached to some stakeholders’ objections, and the major benefits attached to sustaining the 4FRI social license.

In so suggesting, the Eastern Arizona Counties Organization wants to emphasize that it does not promote indiscriminate and aberrant acceptance of any and all parties’ whims or irrational demands, but a well-considered costs and benefits analysis by Forest Service responsible officials, line officers and reviewing officers of public input in their decision process in view of the relative actual significance or lack thereof of such input, and the overwhelming urgency to act, even if imperfectly in some specific cases, such as the protection of the forests of eastern Arizona against catastrophic landscape scale wildfires.

Summary

In summary, the Eastern Arizona Counties Organization wants to re-state its overwhelming support for the 4FRI project, the 4FRI DEIS effort, and the implementation of the 4FRI Preferred Alternative, provided that it is further refined per the suggestions provided by ECO and other stakeholders integral to the sustainability of the 4FRI social license.

Therefore, the concerns and suggestions provided by the Eastern Arizona Counties Organization are not aimed at questioning the need to implement 4FRI, but at pointing out to the USFS 4FRI Team potential issues, gaps or weaknesses in the substance and the process that could be of a nature to compromise a non-conflictual and non-litigious implementation of the 4FRI project, as intended by ECO and the ECO Counties.

The Eastern Arizona Counties Organization is fully aware that per Sec. 1503.4 Response to comments, the USFS 4FRI Team may elect to "Explain why the comments do not warrant further agency response, citing the sources, authorities, or reasons which support the agency's position and, if appropriate, indicate those circumstances which would trigger agency reappraisal or further response" (Sub Sec. 5). However, this is not the expectation of ECO. Rather, ECO expects that the USFS 4FRI Team will receive ECO's comments in the spirit of continuous improvement and risk mitigation in which they were written, and elect to "Modify alternatives including the proposed action" (Sub Sec. 1), and "Supplement, improve, or modify its analyses" (Sub Sec. 3) as allowed for under Sec. 1503.4.

The Eastern Arizona Counties Organization respectfully submits that the above comments and suggestions are substantive in nature and warrant careful consideration and adoption by the Forest Service.

The Eastern Arizona Counties Organization requests to be kept informed as the 4FRI NEPA process progress; hereby reserves its right to provide further comments as the process unfolds; and, requests that the Forest Service commit to receiving and integrating further comments from ECO as provided.

The Eastern Arizona Counties Organization appreciates the opportunity to comment on the 4FRI DEIS and thanks the USFS 4FRI Team for this opportunity. ECO is committed to partner with the U.S. Forest Service to meet the ECO Counties' residents' and visitors' enjoyment, custom, culture, health, security and economic well-being needs.

Thank you for your consideration.

Respectfully Submitted on behalf and with the approval of the Board of Directors,

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Summary of Response to Comments on the DEIS

Approximately 213 letters and/or emails were received on the DEIS. Of these, 71 were form letters. In sum, about 1,000 individual comments were received. This section summarizes and responds to comments by topic. Some topics categorized as outside the scope of this analysis have been included because they were raised in both scoping and DEIS comments and remain unresolved. The complete comment analysis and response document is located in the project record and is available for review on the project website at: http://www.fs.usda.gov/main/4fri/planning. The page numbers referenced in this appendix are from the web version of the DEIS.

Topic 1: NEPA and NFMA Compliance

Topic 1-1: Analysis Site-Specificity: Approximately 8 commenters (CARA 8, 107, 137, 180, 196, 198, 199 and 200) stated the DEIS presented an analysis that was programmatic in nature and not site-specific.

Response: The DEIS displays up to 20 specific silvicultural and prescribed fire treatments for each alternative (DEIS, pages 71-72, 83-84 and 90-91). At least 20 treatments were applied to ~30,000 stands based on site specific characteristics (VSS class, species, single story/multi-story structure, etc.) the result was well over 1,000 different outcomes. Table 18 (DEIS, page 74) displays road activities by restoration unit and table 19 (DEIS, page 74) displays miles and/or acres of springs, ephemeral channels and aspen treatments by restoration unit. Figures 27 and 28 in the DEIS display the locations for road, springs and stream treatments (DEIS, pages 75-76). Examples of site-specific analysis are located in chapter 3 of the DEIS (page 105 to page 322) where site-specific effects for each resource are disclosed. For wildlife and overstory tree metrics, the stand (location/site) is the site specific unit that was used to aggregate data up to the individual metrics displayed within the DEIS. For soil and water, the base unit is the terrestrial ecosystem map unit that aggregates up by stand, by treatment type and intensity. For recreation/scenery, the basic units are the respective recreation opportunity class (ROS) and scenery management classes (SMS) that aggregate up. For economics, the timber volumes are aggregated up from location/sites. For range, the basic unit is the range allotment. For transportation, the basic units are the individual road segments. For botany and rare plants, the basic units tie to select Terrestrial Ecosystem Units where the plants are likely to occur as well as previous survey data for both rare plants and noxious weeds. For fire ecology, the base unit is 30 meter pixels from land fire data that are aggregated up.

The Implementation Plan (DEIS, appendix D, page 601) states, “The process described in this appendix describes the linkage from the EIS to the project specific work without the need for additional NEPA analysis. It must be considered in conjunction with appendix C that provides the design criteria, best management practices, and mitigation measures. Tables 112 to 115 are checklists designed to ensure compliance with the analysis, decision, and other requirements. Essentially, if the quantity of treatments in table 112 and table 113 by resource unit are within the bounds of the treatments analyzed in chapter 3 of the EIS and the specialist’s reports, then the program of work is considered to be consistent with the effects analysis. Table 114 and table 115 show the compliance evaluation and documentation requirements to also demonstrate this compliance. Sections A through E provide direction that would be used by implementation personnel to ensure that implementation meets the purpose and need and forest plan standards and guidelines. It is the foundation for the formal silvicultural prescriptions. The silvicultural prescriptions will document the desired conditions presented in the analysis, incorporate design features and mitigation (appendix C), and provide the course of action needed to move toward

those desired conditions (DEIS, page 601). The narrative for table 114 states, "The checklist is designed to ensure resource surveys are completed as required by the forest plan, policy, U.S. Fish and Wildlife Service (FWS) biological opinion, Comprehensive Forest Landscape Restoration Act (CFLR), or other requirements. The checklist also ensures that the site-specific treatments are compliant with the NEPA analysis and decision. The checklist is designed to be used by the resource specialists who comprise the implementation team and by the Agency's (delegated) approving official" (DEIS, page 601).

The site-specificity of the analysis was tested by the 4FRI stakeholder group on May 12, 2013. In response to comments on the DEIS, the stakeholders wrote, "The Stakeholder Group is concerned that in such a large analysis area, the DEIS might not be detailed enough to disclose site specific impacts of the proposed treatments. To test this concern, three randomly-selected sites were presented to the USFS DEIS development team. For these three stands, we asked to see the data that describes the existing condition, desired condition, proposed treatment, the effects of this treatment on the various resources, and how these effects are considered in the cumulative effects analysis. It took several hours to find all of the requested information for the three sites, but it does appear that extensive site specific analysis went into the DEIS document and we are satisfied that site-specificity is not an issue" (4FRI Stakeholder, 2013 Cara Letter 155).

Most examples of using site-specific data to inform the environmental consequences in the DEIS can be found in the each resource report in the methodology sections. Examples in the DEIS include fire which discloses fire behavior at specific locations of concern, at the subunits, the restoration unit, landscape scales and specific locations (such as Pulliam Airport, Kachina Village, Perkins Telescope, etc. (DEIS, p. 150). How individual Mexican spotted owl PAC treatments were identified for treatment in appendix B pp. 443-444 of the DEIS.

Topic 1-2: Connected Actions: One commenter (CARA 180) stated the analysis was not compliant with NEPA because there are undisclosed connected actions. This concern was addressed in response to comments received on the January 2011 (initial) draft proposed action.

Response: Although the objective for 4FRI is to complete landscape restoration across four forests, this is not equivalent to having a connected action. There is no analysis underway in this EIS that renders decisions that would be needed by the next analysis in order to move forward. By the time the analysis for the Coconino NF and Kaibab NF is complete (with a final FEIS and ROD expected in late 2014 or early 2015) a different strategy may be used for any future analysis. It is unknown whether there may be one analysis or several. Even addressing the next analysis (or analyses) in terms of cumulative effects was too speculative as there are no reasonably foreseeable (quantifiable) proposed activities that can be evaluated in terms of overlap in time and space to the Coconino NF and Kaibab NF analysis. Decisions such as the location of the next analysis or analyses (including analysis boundaries) and the existing and desired conditions for that landscape have not been determined. There is no evidence that the Coconino NF and Kaibab NF proposals as displayed in the DEIS and FEIS will: (i) automatically trigger other actions which may require environmental impact statement, (ii) cannot or will not proceed unless other actions have been taken previously or simultaneously, or (iii) they are interdependent parts of a larger action and depend on the larger action for its justification (40 CFR § 1508.25(a)(1) (i)-(iii)).

We carefully considered if the Rock Pit Development: Coconino and Kaibab National Forests project (http://data.ecosystem-management.org/nepaweb/nepa_project_exp.php?project=34858) that is being conducted for both forests was a connected action. The project was initiated in 2011, The purpose of this project is to develop up to 39 rock pits to provide materials for surfacing

roads to maintain safe and sustainable road conditions on both forests. Rock pit development will benefit this project. However, the intent of the project is to provide road maintenance materials for all roads on both forests –it is not specific to this project. For these reasons, the rock pit project was addressed in cumulative effects.

Topic 1-3: Cumulative Effects: Several commenters (CARA 76, 89, 107, 115, 133, 137, 151, 155, 180, 183, 184 and 197-200) stated that the cumulative effects analysis did not include specific projects, such as the Flagstaff Watershed Protection Project (FWPP). Some commenters stated it was unclear how the cumulative effects appendix in the DEIS was to be used since it appeared to be a list of projects with no analysis. Some commenters stated the cumulative effects analysis for Mexican spotted owl and goshawk was inadequate (also see the NEPA and NFMA Compliance section on Connected Actions).

Response: In response to comments on the DEIS and changes that have occurred since the DEIS was published (see chapter 2) all cumulative effects analyses have been updated in the FEIS and specialists' report to include projects that are reasonably foreseeable, including the FWPP and other natural disturbances (such as the 2014 Slide Fire on the Coconino NF).

Clarifying language has been added to the "Cumulative Effects Appendix F" in the FEIS to reduce the potential for confusion. The intent of the appendix F in the DEIS was to document past and/or historic events and actions that had resulted in the existing/current condition. The intent was to display those actions and events that had the ability to affect vegetation structure, pattern, composition and disturbance regimes. The intent was not to replace the site-specific cumulative effects analysis that each resource conducts.

In the DEIS, the Mexican spotted owl cumulative effects analysis was located on pages 187-189 of the DEIS. The analysis references appendix 12 of the wildlife report where there is an extensive list of projects with notes on the type, size, and objective of each project. Baseline conditions were defined in the text. Table 196 of the wildlife report (page 705) described past projects conducted by the FS and identified the projects by National Forest and Ranger District. Table 197 of the wildlife report (page 719) listed similar information for past projects conducted by other agencies or private land managers. Table 198 (page 720) listed past wildfires to help inform baseline conditions. Table 199 of the wildlife report (page 723) described current and ongoing projects by the FS and identified each project by National Forest and Ranger District. Table 200 (wildlife report) described reasonably foreseeable projects (pp. 734-739). Reasonably foreseeable means that intent and acreage might be known, but until a record of decision is signed, change could occur in the type of treatments proposed, the size of treatments, and the location of treatments. All of these projects (i.e., wildlife report, pp. 705 – 739) were summarized in terms of Mexican spotted owl habitat. An introductory paragraph and seven summary tables followed (wildlife report, pp. 740 – 745). The cumulative effects analysis for past and ongoing projects related to the Mexican spotted owl was divided into effects to forest structure and effects to prey habitat, in line with the project analysis (wildlife report, pp. 319 – 321). The type of action, associated acres, and effects to Mexican spotted owl were discussed. Because there is no certainty as to what might happen, when it will occur, or how large the project will be, reasonably foreseeable actions were addressed separately (page 321). The above actions were summarized on page 187-189 of the DEIS. How these effects relate cumulatively to the 4FRI project was discussed by alternative on pages 188-189 of the DEIS.

However, based on comments on the DEIS and changes between DEIS and FEIS (see the wildlife report for changes that were specific to wildlife), the cumulative effects analysis for Mexican spotted owl was revised. The FEIS wildlife report states, "Because of the size of the 4FRI

analysis area and the large portion of the western Upper Gila Mountain Recovery Unit that it occupies, the analysis area itself was considered adequate for assessing habitat effects to PACs. However, due to the potential for disturbance to owls, the cumulative effects boundary was extended ½ mile beyond the analysis area periphery to account for the spatial component of this analysis...The temporal component in this analysis was defined as 10 years for short-term effects and 30 years for long-term effects" (Wildlife Report, page 400). Projects before 1996 are incorporated into existing conditions. Aspects of existing conditions that are a result of these early projects include a deficit in large trees and snags and even-aged conditions. Pre-1996 projects also had heavy selection pressure for preferred tree genetics to provide healthy trees with good form. This latter effect resulted from harvested areas being regenerated from planting stock or from the selected reserve trees left in seed tree harvest units (Higgins, pers. comm. 2006). Wildlife habitat in the form of nesting, feeding, and loafing sites was reduced by selecting for disease-free trees with symmetric shapes, eliminating fork-top trees, trees with unusual branching patterns, and replanting with selected genetic stock from nurseries.

Current and foreseeable projects within the 4FRI boundary have or will thin a total of 39,111 acres of Mexican spotted owl habitat and use prescribed fire on 37, 585 acres. This is mostly (84 percent) due to work conducted in restricted habitat (Wildlife Report, table 153). Most work done in Mexican spotted owl habitat involves mechanical thinning or prescribed fire. Thinning and burning in Mexican spotted owl habitat would follow forest plan/Recovery Plan guidance with rare exceptions such as powerline right of ways. Other projects also include slash disposal, invasive weed treatments, and limited acres of animal damage control, erosion control, and disease tree harvest (Wildlife Report, Appendix 17). Effects to Mexican spotted owl habitat are broken down into two broad categories: Forest structure and prey habitat. The FEIS cumulative effects analysis for Mexican spotted owl is located on page 400 to page 412 of the wildlife report.

Similar to Mexican spotted owl, the goshawk cumulative effects analysis has been revised since the DEIS was published, see the FEIS, chapter 3.

Topic 1-4: Forest Plan Compliance - Scales of Analysis: One comment (CARA 180) stated the DEIS was not compliant with the forest plans requirement for evaluating old growth habitat at multiple scales – (1) the ecosystem management area; (2) one scale above the ecosystem management area; and (3) one scale below the ecosystem management area. This concern was originally addressed in the June 2011 4FRI Scoping Report (pp. 53-54).

Response: The old growth standards for the Coconino NF 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. In the long term, manage old-growth in patterns that provide for a flow of functions and interactions at multiple scales across the landscape through time. Allocations will consist of landscape percentages meeting old-growth conditions and not specific acres" The old growth guideline for the Coconino NF states, "All analyses should be at multiple scales—one scale above and one scale below the ecosystem management areas" (USDA FS 1987, page 70-1).

The DEIS disclosed the scales of analysis (and rationale) on page 15. To be consistent with the Coconino NF forest plan, scales of analysis based on existing divisions of the landscape were developed specifically for the project. The smallest scale is represented at the stand level with stands averaging less than 100 acres in size. The Ecosystem Management Area (EMA) is the restoration sub-unit. Sub-units range in size from 4,000 to 109,000 acres. The scale above the ecosystem management area is the restoration unit, which ranges in size from 46,000 to 335,000 acres.

Direction specific to the Coconino NF Management Area 3, Ponderosa Pine Mixed Conifer Less Than 40 percent Slope, Old Growth (Coconino NF Forest Plan, replacement page 127) includes direction written as a standard: "Stands managed for old-growth are 100 to 300 acres in size". There is no corresponding direction in the revised Kaibab NF plan (USDA FS 2014).

For the Coconino NF, forest plan direction for goshawk, old growth, wildlife hiding and thermal cover, and timber resource management, references conducting evaluations at the ecosystem management areas (EMAs) scale. However, beyond this forest-wide direction, which is a result of the 1996 amendment of 11 forest plans, there is no additional direction in the forest plan regarding the use of ecosystem management areas. For example, there is no relationship or crosswalk between the ecosystem management area to plan management areas. Across the forest, vegetation projects that are required to stratify vegetation and habitat at a scale above and below the ecosystem management area have directly linked the ecosystem management area to a 10,000-acre (10K) block analysis. The 10K blocks have been based on stand boundaries. For those projects that exceeded 10,000 acres, the scale above the ecosystem management area was often a conglomeration of 10,000-acre units (Cote, personal communication with Flagstaff RD 2011).

Using a 10,000-acre scale would have been meaningless for a project of this size. The 10K block was used as a surrogate as a means to get to a landscape scale of analysis. A 10K analysis for this project would be too small to use for assessing impacts at the landscape and ecosystem scale. A key assumption in using the 10K block was if objectives were being met at the 10K, objectives were being met at the larger scale. There was a need to use scales which allowed for meaningful analysis from the small scale to the landscape scale. Coconino NF plan language specifically says blocks may be larger or smaller if approved by the forest supervisor. The Coconino NF supervisor may sign a project record document demonstrating the need, and rationale for, deviating from the 10K analysis (Coconino NF Forest Plan, page 70).

Since the DEIS was published, the Kaibab NF revised its forest plan (USDA FS 2014). Desired conditions (paraphrased) at the fine scale include having tree groups of various age classes and size classes, having crowns of trees within the mid-aged to old groups (Kaibab NF forest plan, p. 17). The (paraphrased) desired condition at the landscape scale (over 10,000 acres) is to have old growth occur throughout the landscape as a component of uneven-aged management with the location of old growth shifting on the landscape as a result of succession and disturbance. Old growth components include old trees, snags, coarse woody debris, and structural diversity (Kaibab NF forest plan page 18). The FEIS reflects the new plan direction. The vegetation analysis in the FEIS (chapter 3) describes how the alternatives move towards desired conditions. The implementation plan (appendix D in both the DEIS and FEIS) describes in detail how treatments would be designed to protect old trees.

Topic 1-5: Interconnected Relationship between the NEPA Analysis and the 4FRI Stewardship Contract: One comment (CARA 180) stated the Forest Service was required to prepare the comprehensive EIS for the 4FRI program before awarding the "Phase 1" contract to Pioneer Forest Products. The Agency violated 40 C.F.R. § 1500.1(b) which states "NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken".

Response: This comment was categorized as outside the scope of this analysis. The Phase 1 4FRI Stewardship contract was not a NEPA decision and is utilizing existing, signed NEPA decisions to implement the contract. Each NEPA decision is designed to meet the intent of their respective forest plans, not a comprehensive restoration strategy. The phase 1 4FRI contract is a mechanism

to implement individual NEPA decisions that, in turn, implement the respective forest plan. The cumulative effects of implementing signed NEPA decisions are disclosed in each respective NEPA document and are tied to future foreseeable actions that were outlined in the Schedule of Proposed actions at the time of the analysis (see DEIS and FEIS appendix F)

Topic 1-6: Programmatic EIS: Approximately 5 commenters (CARA 180, 196, 198, 199, and 200) stated a programmatic EIS should have been conducted as there are connected actions between the 4FRI analyses and segmentation has occurred.

In 2011, conducting a programmatic EIS was ultimately considered outside the scope of this analysis. This concern was addressed in responses to the January 2011 (initial) draft proposed action. Although the objective for 4FRI is to complete landscape restoration across four forests, this is not equivalent to having a connected action. There is no analysis underway in this EIS that renders decisions that would be needed by the next analysis in order to move forward. By the time the analysis for the Coconino NF and Kaibab NF is complete (with a FEIS and draft ROD issued in 2014) a different strategy may be used for any future analysis. It is unknown whether there may be one analysis or several. Even addressing the next analysis (or analyses) in terms of cumulative effects was too speculative as there are no reasonably foreseeable (quantifiable) proposed activities that could be evaluated in terms of an overlap in time and space to the Coconino NF and Kaibab NF analysis.

Decisions such as the definitive location of the next analysis or analyses (including analysis boundaries) and the existing and desired conditions for that landscape have not been determined. As of August 2014, data is being collected. There is no evidence that the Coconino NF and Kaibab NF proposed actions, currently under analysis, will: (i) automatically trigger other actions which may require environmental impact statement, (ii) cannot or will not proceed unless other actions have been taken previously or simultaneously, or (iii) they are interdependent parts of a larger action and depend on the larger action for its justification (40 CFR § 1508.25(a) (1) (i)-(iii)).

Conducting a programmatic EIS would require numerous, segmented analyses in order to move towards the landscape restoration objective. The issue of moving forward with a programmatic EIS versus as project specific EIS was discussed with CEQ on October 14, 2009 when the landscape restoration proposal was being prepared as a CFLR proposal. The Coconino and Kaibab NFs, the Southwestern Regional Office, NEPA/planning representatives from the Agency's Washington Office, CEQ and 4FRI stakeholder representatives were on the conference call. The notes from this landscape strategy conference call are located in the project record.

Topic 1-7: Range of Alternatives and Comparison of Alternatives: Approximately ten comments (CARA 76, 89, 95, 98, 107, 115, 133, 137, 151, 155, 162, 163, 164, 165, 172, 174, 177, 180, 184, and 196-200) questioned whether an adequate range of alternatives had been evaluated in the DEIS. This topic was categorized as a procedural concern statement and was added to chapter 1 in the FEIS.

Response: The Agency is required to: "Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources as provided by section 102(2)(E) of the Act"(40 CFR 1501.2(c**)). "**The EIS shall document the examination of reasonable alternatives to the proposed action. An alternative should meet the purpose and need and address one or more significant issues related to the proposed action. Since an alternative may be developed to address more than one significant issue, no specific number of alternatives is required or prescribed "(36 CFR

220.5(e)). Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant (40 CFR Section 1502.14). The phrase "range of alternatives" refers to the alternatives discussed in environmental documents. It includes all reasonable alternatives, which must be rigorously explored and objectively evaluated, as well as those other alternatives, which are eliminated from detailed study with a brief discussion of the reasons for eliminating them (40 CFR *Section 1502.14*).

The DEIS (page 62) included 9 alternatives including no action, three action alternatives and five alternatives that were considered but eliminated from detailed study. The alternatives responded to the issues received from the public (2011 Scoping Report, project record). In response to comments received on the DEIS, a fourth action alternative that would propose no forest plan amendments was analyzed in the FEIS. This increased the number of fully analyzed alternatives to five (four action alternatives and the no action alternative), and increased the number of alternatives considered but eliminated from detailed study to six. More important than the actual number of alternatives, is whether unresolved issues have been addressed through alternative development or environmental analysis. The range of alternatives considered by the responsible officials includes all reasonable alternatives to the proposed action that are analyzed in the document, as well as other alternatives eliminated from detailed study.

Topic 1-8: Significant Forest Plan Amendments: Approximately 22 comments were submitted on this topic (CARA 76, 89, 95, 98, 107, 115,133, 137, 151, 155, 162, 163, 164, 165, 169, 172, 174, 175, 184, and 197-200). Some commenters stated the DEIS (alternatives B-D) failed to support a finding that the plan amendments are nonsignificant. Some commenters stated the public cannot use the data in the analysis to determine the acres affected and to understand how these acres are related to other anticipated uses. Some commenters stated the proposed amendments are significant because they may bring about changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area, see FSM 1926.52 (Jan. 31, 2006).

The environmental cause and effect relationship is the perceived dramatic change in management for Mexican spotted owl that may result in harm to the Mexican spotted owl. On the Coconino NF, the amendments authorized (alternative B-D) mechanical treatments in Mexican spotted owl PACs that exceed 9 inch d.b.h. and authorize the use of prescribed fire in Mexican spotted owl PAC core areas (alternative C). In alternatives B-D all Mexican spotted owl existing monitoring requirements were removed and specific monitoring requirements were deferred to the FWS biological opinion. For goshawk, the amendments on the Coconino NF authorized managing acres for an open reference condition (up to 90 percent open) and clarified how (and where) canopy cover would be measured.

Some commenters stated the plan amendments are significant because the Forests are including identical plan amendments in similar vegetation projects; therefore, providing direction that must be followed by other projects. Some commenters asked for examples of other projects with nonsignificant plan amendments. Some commenters suggested wording to improve clarity.

Response: In the DEIS, amendments for both the Coconino NF and Kaibab NF were analyzed and determined to be site-specific, nonsignificant forest plan amendments (DEIS, pp. 439-564). . The significance of each amendment was evaluated in accordance with FSH 1926.51 and FSH 1926.52(DEIS appendix B). This topic was added to chapter 1 in the FEIS as a procedural concern.

In response to comments on the DEIS, an alternative that proposes no forest plan amendments for the Coconino NF (alternative E) was developed. The purpose of the alternative is to allow the public another way to compare and contrast environmental consequences between alternatives. It also (partially) responds to the significance topic. In alternative E, treatments in Mexican spotted owl PAC habitat would be restricted to 9 inch d.b.h. (current Coconino NF forest plan direction). The basal area in threshold habitat would remain 150. There would be no prescribed fire use in Mexican spotted owl PAC core areas. In goshawk habitat, there would be no savanna treatments and there would be no clarification language that describes the relationship between interspaces and canopy closure.

Since the DEIS was issued in 2012, a revised Kaibab NF Forest Plan became effective (USDA FS 2014). All forest plan amendments for the Kaibab NF have been removed from the FEIS because the alternatives are consistent with the revised Kaibab NF forest plan. The project's desired conditions for ponderosa pine were based on the best available science for the restoration of southwestern fire-adapted ecosystems (Reynolds et al. 2013). These desired conditions informed the Kaibab NF's plan revision process. The amendments for Mexican spotted owl were removed because the project is consistent with the forest plan in that a guideline for threatened, endangered and sensitive species directs projects to integrate management objectives and protection measures from approved recovery plans (KNF forest plan, p. 51).With design features and mitigation, alternatives B through E are consistent with forest plan objectives, desired conditions, standards and guidelines, although movement towards desired conditions varies by alternative. Kaibab NF forest plan consistency evaluations are located in each resource report. A consolidated evaluation is in the project record.

Three nonsignificant amendments for the Coconino NF were evaluated in the FEIS. The proposed forest plan amendments are authorized via 36 CFR 219, the Forest Service Planning Rule. Section 219.17(b)(3) of the Rule provides the transition language that allows this project to propose amendments to the Coconino NF forest plan using the provisions of the 1982 Planning Rule. All amendments are a specific, one-time variance for the Coconino NF restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project.

The purpose of amendment 1 is to bring the alternative in alignment with the revised Mexican spotted owl Recovery Plan (USDI FWS 2012) and defer monitoring to the FWS biological opinion that is specific to this project. Amendment 2 clarifies existing direction related to managing canopy cover and interspace in the forest plan. The purpose of amendment is to bring the project into alignment with the best available science (Reynolds et al. 2013) that provides desired conditions for restoring fire-adapted ponderosa pine in the Southwest. Amendment 3 resolves a forest plan error related to the management of heritage resources and is specific to this project. The detailed significance analysis for each amendment is located in appendix B of the FEIS.

Amendments 1 through 3 were evaluated in accordance with the significance amendment criteria in FSM 1926.51 and FSM 1926.52. The significance analysis for each amendment included in the selected alternative is displayed in this appendix.

No amendment alters multiple use forest plan goals and objectives, adjusts management area boundaries or management prescriptions. The changes in standards and guidelines are considered to be minor because they reflect the latest, best available science (Reynolds et al. 2013). The amendments bring the alternatives into alignment with the revised Mexican spotted owl Recovery Plan, although the degree of alignment varies by alternative. No amendment would alter the long-

term relationship between levels of multiple-use goods and services originally projected for the Coconino NF. These outputs were specific to a planning period ranging from 10 to 15 years (as identified in 1987). In the preferred alternative (alternative C):

- Amendment 1: The amendment would affect 6,906 acres or 18 percent of Mexican spotted owl PAC habitat on the Coconino NF.
- Amendment 2 is clarification amendment. The canopy cover portion of the amendment would generally affect 137,242 acres (15 percent) of all goshawk habitats on the Coconino NF. Managing 28,653 acres of ponderosa pine for an open reference condition would affect approximately 3 percent of all suitable goshawk habitats on the Forest.
- Amendment 3 is specific to the 355,707 acres of proposed treatments in this project. The amendment would affect about 20 percent of the Coconino NF (which totals 1,821,495 acres).

For these reasons, the amendments would not result in an important effect to the entire land management planning area. Each amendment is a specific, one-time variance for this restoration project. The best available science for management in Southwestern forests (Reynolds et al. 2013), the (Coconino NF) forest plan revision process, is affecting ongoing and future analyses. The plan amendments that are specific to this project do not impose direction on ongoing or future analyses.

Some commenters stated the project amendments would impose direction for other ongoing and future vegetation projects. We reviewed the list of vegetation projects that were included in comments on the DEIS. Overall, the forest plan amendments that have been proposed in other vegetation projects reflect the ongoing Coconino NF forest plan revision process, using the best available scientific information (Reynolds et al. 2013), and being compliant with the revised Mexican spotted owl Recovery Plan (USDI FWS 2012). A complete analysis of other proposed forest plan amendments by project is located in the project record.

In the FEIS, all amendments have been updated to reflect changes in acres (see Changes from DEIS to FEIS in chapter 2of the FEIS).

Topic 2: Project Design, Implementation and the Protection of Large Trees and Old Trees

Topic 2-1: Heterogeneity: Approximately 19 comments (CARA 76, 89, 95, 98, 151, 155, 158, 162, 165, 169, 174, 175, 180, 184 and 196-200) and approximately 56 form letters (CARA 19 – form master) asked how the project is designed to contribute to heterogeneity at the landscape scale. Features contributing to heterogeneity include old trees, large trees, seedlings/saplings and young trees (typically ponderosa pine 2 feet tall to ~8.5 inches d.b.h.), Gambel oak, overall tree density, tree group size, tree group density, and openness. The DEIS implementation plan (appendix D) addressed design for each of these criteria: Also see topic 2-5 which addresses the protection of old and large trees.

Old Trees: The DEIS included specific treatment designs that manage for the sustainability of old trees in appendix D (implementation plan) on pages 613-629, 631-637, 639 to 641. Examples of treatment design include: “Treatments are designed to manage for old age trees in order to have and sustain as much old forest structure as possible across the landscape. Treatments would follow the old tree implementation strategy and old trees would not be targeted for cutting. Live conifer trees with existing cavities, dead tops, and lightning scars would also be favored for

retention" (page 627). Page 627 of the plan also states, "Retain all pre-settlement trees and the largest post-settlement trees that most closely resemble old trees in size and form as replacement trees adjacent to pre-settlement tree evidences at a 1:1 ratio. Some younger trees would also be retained to maintain uneven-aged structure. A higher leave tree to evidence ratio may be required to maintain the desired tree cover range".

Large Trees: The DEIS included specific treatment designs that manage for the sustainability of large trees in appendix D (implementation plan) on pages 610, 612-614, 616, 618-620, 622-627, 629-630, 632 and 634. In response to feedback and comments received on treating less aggressively and leaving more large trees, canopy cover would be measured at the stand level on about 38,256 acres of goshawk habitat where there is a preponderance of VSS 4, 5 and 6.

Seedlings/Saplings and Young Trees: The DEIS provided direction on how seedlings/saplings and young trees would be managed on pages 616, 620, 629 and 630. For example, the implementation plan states on page 616, "Regeneration openings (group selection) account for 10 to 20 percent of tree groups. The percentage would vary within this range depending on depending on current age class distribution. They would average 0.3 to 0.8 acre and would not exceed 200 feet wide. In general, regeneration openings would not be larger than 2 acres. However, they may extend up to 4 acres in specific areas where ponderosa pine mistletoe infections are heavy. They would only be established by removing groups of trees comprised of the most abundant tree size classes. Regeneration openings would be created adjacent to tree groups and would not be surrounded by interspace".

Gambel Oak: The DEIS included specific treatment designs that manage for the sustainability of Gambel oak in appendix D (implementation plan) on pages 610-611, 613-614, and 616-617. Pages 611 and 613-614 state, "Gambel oak, juniper, and pinyon species will not be cut as part of the treatments. These species may only be cut when there is no other option to facilitate logging operations (skid trails and landings)". Pages 620, 622-623, 625-627, 631, 633, 635, 636, and 639 address managing for the sustainability of large oaks by removing ladder fuels and overtopping trees.

Overall Tree Density is addressed in the DEIS (appendix D, implementation plan) on pages 610, 612, 614, 615, 618, 621, 623, 625, 628, 631, 633 and 636. For example, the language on page 610 states, "Manage for 150 square feet of basal area where present or to attain 150 square feet of basal area in areas with site potential capable of sustaining high tree density in alternative B and D. In alternative C, manage for a minimum of 110 square feet of basal area where present or to attain 150 square feet of basal area in areas with site potential capable of sustaining high tree density".

Tree Group Size is addressed in the DEIS (appendix D, implementation plan) on pages 616, 619, 622, 624, 629, 632, and 634. For example, language on page 616 states, "Tree groups, on average, would range in size from 0.1 to 1 acre with northerly aspects and highly productive microsites having larger average group sizes. Overall, average group size would vary within this range depending on site quality, existing stand structure, and pre-settlement tree evidence"...

Tree Group Density is addressed in the DEIS (appendix D, implementation plan) on pages 619, 624, 626, 629, 632, 634 and 636. For example, the language on page 619 states, "Tree group density would be managed to meet the canopy cover requirement of 40 plus percent within mid-aged forest (VSS4), mature forest (VSS5), and old forest (VSS6) tree groups and to assure that immature tree groups (VSS 2 and 3) are managed to maintain tree stocking necessary to provide for desired canopy cover as the groups mature to VSS 4, 5, and 6. By following the stocking

guidelines and maintaining interlocking or nearly interlocking tree crowns, tree group density would meet and exceed the canopy cover requirements. Stocking guidelines for tree groups for the WUI55, UEA40, UEA25, and UEA10 mechanical thin treatments are as described in table 119".

Openness is addressed in the DEIS (appendix D, implementation plan) on pages 610, 613-614, 616, 620-624, 627, 629 and 632-635. For example, page 616 states, "Interspace would occupy approximately 25 to 40 percent of the area; Interspace width between tree groups would average from 25 feet to 60 feet with a maximum width of 200 feet". Table 118 on page 618 displays the percent of area occupied by interspace ranges from 10-70 depending on treatment type and intensity.

In the FEIS, additional analysis conclusions have been included for heterogeneity. For example, in the summary comparison of alternatives table (FEIS chapter 2), a heterogeneity category has been included. Metrics including percent openness or interspace (at landscape and habitat type sub-scale) and spatial arrangement have been used to describe the post-treatment condition. Also see the silviculture report.

Topic 2-3: Alternative C Research Proposal (Paired Watershed Study): Two comments (Cara 98 and 162) recommended refinement of the research proposals included in the DEIS in Alternative C and to identify water yield as a primary objective.

Response: While treatments were not designed solely to benefit water yield, the DEIS evaluated the potential for changes in water yield from treatments, see table 31 and pages 111 to 115. Page 45 (paragraph 3 and 4) of the water quality specialist report evaluates the cumulative differences on water yield between no action (alternative A) and Alternative C. Pages 46 and 47 of the report discuss potential change to water yield associated with prescribed fire. The FEIS evaluates water yield differences by alternative. Recommendations on finalizing the treatments and clearly identifying control watersheds were incorporated into the FEIS. In addition, the title of the proposed activity was changed to paired watershed study to clarify the purpose of the study is not simply to assess water yield but to also assess how landscape-scale treatments affect watersheds.

Topic 2-4: Monitoring and Adaptive Management: Approximately 22 letters (CARA 76, 89, 98, 107, 115, 133, 137, 151, 155, 162, 163, 164, 169, 172, 175, 180, 184 and 196-200) and approximately 56 form letters (CARA 19 – master form) were received on the monitoring and adaptive management plan that was included as appendix E in the DEIS. The comments stated the monitoring plan included in the DEIS was incomplete and lacked trigger points for monitoring goshawk. Some commenters stated it was unclear whether Mexican spotted owl monitoring would occur and range-wide Mexican spotted owl monitoring was recommended.

Response: At the time the DEIS was released, formal consultation with FWS (which resulted in a biological opinion) had not been initiated. The FWS signed the biological opinion (AESO/SE 22140 -2011-F-014) for the project on October 20, 2014. Since the DEIS was published, the Forest Service worked with stakeholders and finalized the Adaptive Management, Biophysical and Socioeconomic Monitoring Plan (appendix E); and, a multi-party monitoring board was created to manage and guide monitoring through project implementation.

Appendix E of the FEIS includes goshawk monitoring. A monitoring protocol for Mexican spotted owl was developed by the FWS in collaboration with the Forest Service during the formal consultation process. The protocol includes monitoring breeding pair occupancy reproductive output, and key habitat components across multiple pairs of treatment and reference PACs and also across different treatment types. The data that results from implementing this monitoring

protocol will help provide important information about the effects of restoration treatments on Mexican spotted owl and will be used to inform adaptive management. A description of these protocols is included in appendix E.

Conducting range-wide monitoring for Mexican spotted owl was considered beyond the scope of this project. Population monitoring at a biologically meaningful scale requires large landscapes that include multiple states and jurisdictions. An undertaking of this scale has been initiated by the USFS Regional Office in cooperation with the Rocky Mountain Bird Observatory. In addition to Mexican spotted owl monitoring, appendix E now incorporates monitoring for Arizona bugbane.

Topic 2-5: Old and Large Tree Protection: Approximately 19 comments (CARA 76, 89, 95, 98, 151, 155, 158, 162, 165, 169, 174, 175, 180, 184, and 196-200) and approximately 56 form letters (CARA 19 – form master) stated it was unclear how old and large trees would be protected. Comments indicated the proposed actions did not adequately protect old trees and promote large trees. Also see topic 2-1 (heterogeneity).

Response: The DEIS included specific treatment designs that manage for the sustainability of old trees in appendix D (implementation plan) on pages 613-629, 631-637, 639 to 641. Examples of treatment design include: “Treatments are designed to manage for old age trees in order to have and sustain as much old forest structure as possible across the landscape. Treatments would follow the old tree implementation strategy and old trees would not be targeted for cutting. Live conifer trees with existing cavities, dead tops, and lightning scars would also be favored for retention” (page 627). Page 627 of the plan also states, “Retain all pre-settlement trees and the largest post-settlement trees that most closely resemble old trees in size and form as replacement trees adjacent to pre-settlement tree evidences at a 1:1 ratio. Some younger trees would also be retained to maintain uneven-aged structure. A higher leave tree to evidence ratio may be required to maintain the desired tree cover range”.

The vegetation analysis disclosed post treatment impacts to old and large trees on pages 140 of the DEIS: “Restoration treatments proposed in alternatives B, C, and D are designed to manage for old age trees in order to have and sustain as much old forest structure as possible across the landscape. Old trees would not be targeted for cutting. Reference the old tree implementation plan in appendix D of the DEIS. The analysis presented for Mexican spotted owl indicates the post-treatment distribution of size classes has good representation in the 18- to 24 inches size classes in all habitats. Stocking in the 24 inches plus size class would have good representation in the restricted other habitat and would be underrepresented in the target/threshold habitat. The goshawk analysis indicates that mature and old forest structural stages that are currently underrepresented would trend toward improved representation in all habitats. Treatments within areas currently allocated old growth would maintain existing old growth structural attributes and would be managed to move toward those conditions over time. The ponderosa pine old growth analysis above indicates old growth structural attributes would continue to develop and improve across the landscape. The forest health discussion presents that the overall sustainability of the ponderosa pine forest would be improved across the landscape including the large/old tree component”.

In response to comments on the DEIS, the purpose and need in chapter 1 was edited to include more language on Collaborative Forest Landscape Restoration Act requirements (a focus on smaller diameter trees) and a large tree desired condition section. The implementation plan (appendix D) was updated to add consistency checks to the Collaborative Forest Landscape Restoration Act (CFLRA). See the annual implementation checklist and NEPA, NFMA, ESA and

CFLRA compliance evaluation tables. Additional design features were added to clarify when large, young trees would be cut. An example of the language can be found in the goshawk LOPFA WUI55, UEA 40, UEA 25 and UEA 10 section.

In response to feedback and comments received on treating less aggressively and leaving more large trees, canopy cover will be measured at the stand level on about 38,256 acres of goshawk habitat where there is a preponderance of VSS 4, 5 and 6.

Topic 2-6: Group Size, Regeneration Openings and Post-Treatment Openness (also see Heterogeneity): Approximately 18 letters (CARA 76, 89, 95, 113, 133, 151, 155, 162, 169, 172, 174, 180, 184, and 196-201) and approximately 56 form letters (CARA 19 – form master) included comments on this topic. Some commenters questioned creating regeneration openings in ponderosa pine forests. Some commenters stated (this action) is not supported because there is little evidence that this pattern exists in historic reconstructions. Some commenters were concerned that regeneration openings would remove young, large trees that should be retained. Clarification on how regeneration groups would be designed (and from what age and size class) was requested. Conversely, some commenters were concerned that the post treatment group density would be too high as a result of having regeneration opening treatments that are too conservative (and will result in an excess of small trees). In this scenario, movement towards stakeholder desired conditions may not be achieved. Some recommendations included adding a proportion of different tree group sizes for each treatment type so that it is clear how much heterogeneity there will be in tree group sizes. Some recommendations asked the FS to provide more detail on the impacts associated with not being able to create regeneration openings, and define the point at which movement towards desired conditions is not achieved.

Response: The implementation plan (DEIS Appendix D) included a variety of designs that utilize a “read the land” approach. For example pages 616, 619, 622, 624, 629, 632, and 634 addressed design. Overall, the average group size would vary depending on site quality, existing stand structure, and pre-settlement tree evidence. Table 139 includes guidance on the placement of tree groups, interspace, and regeneration openings. The placement would vary depending on existing conditions. Along with the design, table 140 (DEIS page 654) emphasizes that interspace, regeneration openings, tree group density, and overall density need to be considered together as opposed to individual entities in order to achieve the desired conditions. This concept is further highlighted in figure 74 (DEIS, page 657) by disclosing the confines at which tree group stocking can be managed in order to achieve a sustainable and resilient forest. For treatments that prescribe interspace and regeneration openings, adjustments to interspace width (and therefore tree group size), and the amount of regeneration openings, may be made during implementation to ensure tree group density remains outside of the “red zone” density.

Group stocking in VSS 4, 5, 6 in goshawk habitat is designed to meet forest plan canopy cover requirements (Coconino NF forest plan) and desired conditions (Kaibab NF forest plan). The amount of regeneration openings that would be implemented is a combination of existing and created regeneration openings that would achieve 10 to 20 percent of the landscape within a treatment area. If there is regeneration on the landscape (existing condition) it would be accounted for and site specific treatments would not be designed to create regeneration. What is existing on the site would dictate the treatment. The stocking guide includes a red zone for the purpose of displaying how the prescriptions would not allow for remaining in or moving into the red zone. For example, 20 percent would be the maximum in the red zone. The project would manage for 10 percent of that. We would adjust the regeneration rate to keep out of the red zone. We would manage for less regeneration openings based on what is on the ground. There may be

some sites where regeneration openings would not be put in because it would put us into the red zone stocking. This would be determined on site.

In response to comments on the DEIS, additional clarifications regarding the creation of regeneration openings have been made. The implementation plan now emphasizes that when outside of the wildland urban interface (WUI) restoration treatments in goshawk habitat would focus on the removal of small diameter trees and would emphasize large trees retention to move towards deficit stand structure, were applicable. This would be accomplished by placing an emphasis on creating regeneration openings and interspace in areas where vegetation structural class 3 and the smaller VSS 4 trees dominate. The placement of tree groups reserved for retention would focus on areas where the largest trees are already aggregated. These groups would generally range between 0.25 and 1 acre in size. This would result in stands being composed of larger tree groups intermixed with relatively small openings. In stands with a preponderance of large young trees the treatment intensity would be managed to the lower end of the available spectrum. Management in these stands still recognizes the need to create regeneration openings to be able to promote uneven aged stand conditions. The FEIS includes analysis which displays the effects on restoration objectives when adequate interspace and regeneration openings cannot be created (alternative E). This analysis is derived from the silviculture report.

Topic 2-7: Sequencing (prioritization) of Mechanical and Prescribed Fire Treatments: Approximately 21 commenters (CARA 76, 89, 95,133, 151, 155, 158, 162, 163, 164, 165, 172, 174, 180, 184 and 196-201) recommended the environmental analysis address the sequencing of mechanical and prescribed fire treatments. Commenters stated sequencing would assure that those areas that are at most risk from high severity wildfire (or in most need of treatment) being prioritized and treated first.

Response: This recommendation was categorized as outside the scope of this analysis. The disclosure of sequencing within a NEPA document would be problematic because it would bind the Agency to a fixed schedule that may be unattainable due to weather, fires, markets, or other unforeseen circumstances. It would likely result in inaccurate assumptions being used to analyze the environmental consequences for all resources. Although the FEIS does not address implementation sequencing, the operations component of 4FRI will continue working with stakeholders in the spirit of implementing the requirements of the CFLR Act. A 10-year operational plan will be developed. This recommendation is most appropriately addressed in implementation and operations.

Topic 2-8: Strategic Placement of Treatments: Approximately 23 commenters (CARA 76, 89, 95, 107, 115, 133, 137, 151, 155, 158, 162, 163, 164, 165, 172, 174, 180, 184 and 196-201) stated treatments should be strategically placed to promote fire use for resource benefits and increase effectiveness of fire suppression.

Response: This recommendation was categorized as being outside the scope of the analysis and not in alignment with the purpose and need for the project. Treating only strategic locations is a strategy used for hazardous fuels treatments when the primary objective is to modify fire behavior and to reduce high severity fire effects. In ponderosa pine, there is an overlap between hazardous fuel treatments and restoration treatments because restoring ponderosa pine forests generally results in reducing the severity of potential fire effects. Fuel treatments can include such strategies as thinning from below or leaving a minimum distance between tree crowns or boles. Neither of these would put a ponderosa pine forest on a trajectory towards health and resilience. The treatments displayed in the DEIS (alternative C, preferred alternative) and FEIS are designed to put the landscape on a trajectory towards the desired condition by treating the entire landscape,

not just ‘strategically’ placed treatments. Additionally, on a landscape the size of the 4FRI, it would be a gamble to guess where a fire might start, and the variables would be too numerous to make such an assessment valid.

Topic 2-9: Unplanned Ignitions: Approximately 9 commenters (CARA 107, 115, 137, 180, and 196-201) suggested the analysis needed to evaluate and plan for spatially explicit unplanned ignitions.

Response: This recommendation was categorized as outside the scope of the analysis. The only discussion of the management of unplanned ignitions relates to how 4FRI treatments would be expected to increase decision space for line officers when they are considering how to manage unplanned ignitions. Page 129 of the fire ecology report (for the DEIS) states, “Decision space for managing unplanned ignitions would expand as 4FRI (and other projects) are implemented”. Management of unplanned ignitions is also mentioned on pages 158 and 188 of the DEIS.

Topic 2-10: Evidence-Based Full Restoration and Movement towards the Natural Range of Variability: Approximately three commenters (CARA letter 98, 165, and 177) stated designing treatments based on the goshawk guidelines (forest plan) is not ecologically-based restoration. Without developing an evidence-based, full restoration analysis, there is no way to adequately compare the tradeoffs between: a restoration alternative that replicates the historic range of variability (HRV, referred to as the natural range of variability (or variation) in this analysis) and restores forests to pre-fire exclusion conditions, or an analysis that is designed to address restoration and issues associated with forest openness, closed canopy species, and canopy cover/closure. Science that supports ecological restoration includes (but is not limited to) Woolsey (1911), Cooper (1960), White (1985), Pearson (1950), Covington et a1. (1997), and Abella and Denton (2009).

Response: An evidence-based full restoration alternative was considered but eliminated from detailed study (FEIS, chapter 2). Only a summary of the rationale is provided here. See the FEIS chapter 2 and the project record for additional details.

Mexican spotted owl habitat: The evidence-based full restoration alternative would adversely affect the quality and quantity of 100 percent (35,262 acres) of Mexican spotted owl protected habitat. This alternative would not be compliant with the Coconino NF forest plan or the revised Mexican spotted owl Recovery Plan. Because the alternative is not compliant with the revised Mexican spotted owl Recovery Plan, it would not be compliant with the Kaibab NF forest plan (USDA FS 2014). The full restoration alternative is not consistent with the purpose and need for the project.

In target and threshold habitat, forest resiliency and the understory grass/forb/shrub matrix would be improved. However, the low basal area would delay or prevent the development of 8,692 acres of future nesting and roosting habitat. This would limit recovery potential. The full restoration alternative would move the species further away from recovery objectives. The full restoration alternative would not be compliant with the Coconino National forest plan or the revised Mexican spotted owl Recovery Plan. Because it is not compliant with the revised Mexican spotted owl Recovery Plan, it would not be compliant with the Kaibab Land and Resource Management Plan.

In Mexican spotted owl restricted other habitat, due to the low basal area, the full restoration alternative is likely to decrease the quantity and quality of owl habitat even though the basal area averages are similar because there would be a substantial decrease in oak in the full restoration alternative. Reducing oak would not be in alignment with the purpose and need to maintain and promote oak for several species of wildlife in general including Mexican spotted owl (DEIS,

pages 19, 616-617). Actions that reduce the quality and quantity of the habitat are not consistent with recovery objectives. The full restoration alternative would provide the most understory response (benefit to Mexican spotted owl prey species) and increase the resiliency of the habitat the most to stochastic events such as bark beetle outbreak and climate-influenced changes. However, due to the post treatment basal area and actions that reduce oak, the full restoration alternative would not be consistent with the forest plans or the revised Mexican spotted owl Recovery Plan.

Goshawk Habitat: In goshawk post-fledging family areas nest areas, the lower percent max stand density index range in the full restoration alternative would increase resiliency to natural disturbances. However, approximately 75 percent of nest habitat would be compromised by converting the forested environment to an open landscape interspersed with individual trees or tree groups. Although goshawk habitat use is variable across its range, goshawk consistently seek larger trees and higher canopy cover for nesting. The reduction in coarse woody debris (CWD) that would be expected with full restoration would not be in alignment with forest plan desired conditions for managing coarse woody debris between 3 to 10 tons per acre on the Kaibab NF and 5 to 7 tons per acre on the Coconino NF. The full restoration alternative would reverse the upward trend found in alternative B to a range of 0.6 to 0.8 snags greater than 18 per acre. The downward trend would not be in alignment with desired conditions.

In goshawk dispersal post-fledging family areas / post-fledging family areas, the lower percent max stand density index range in the full restoration alternative would increase resiliency to natural disturbances. However, approximately 68 percent of dispersal post-fledging family areas / post-fledging family areas would be compromised by converting the forested environment to an open landscape interspersed with individual trees or tree groups. Although goshawk habitat use is variable across its range, goshawk consistently seek larger trees and higher canopy cover for nesting. The downward trend that would be expected with full restoration in coarse woody debris would not be in alignment with forest plan desired conditions for managing coarse woody debris between 3 to 10 tons per acre on the Kaibab NF and between 5 and 7 tons per acre on the Coconino NF. The full restoration alternative would result in less movement towards desired conditions for large snags, prolonging poorer habitat conditions.

Topic 2-11: Incorporation of the original Large Tree Retention Strategy: Approximately 17 comments (CARA 76, 89, 95, 133, 158, 163, 164, 174, and 184 [eastern Counties including Apache, Graham, Greenlee, Navajo and Gila], 172, 180, 196-201) stated that incorporating a modified large tree retention strategy did not meet the intent of what the 4FRI stakeholders had provided. Large, young trees and old trees would not be protected and regeneration openings would be developed “on the back” of large, young trees that should be retained. The 4FRI stakeholders (CARA 155) stated, “Some stakeholders felt strongly that the USFS did not meet the intent of the OGP & LTRS in all areas, while other felt that the Old Tree and Modified Large Tree implementation plans included in the DEIS reflected the substance and intent of the stakeholder document and were otherwise sufficient. **Consequently, the stakeholder group does not have a 100 percent consensus statement regarding incorporation of the OGP and LTRS into the DEIS**”. (pp. 13-14). Approximately 66 (Sierra Club) form letters (CARA 19 – master form) stated the large tree retention strategy should be made integral to the proposed action. Also see Topic 2-5.

Response: The conservation of large trees was identified as issue 2 in the DEIS. In addition to evaluating the issue of large trees, an alternative that addresses the large tree retention strategy was considered but eliminated from detailed study (DEIS, pp. 56 to 58). Since the topic of retaining large trees has (in the past) implied the need for a d.b.h. cutting diameter limit, the DEIS

includes an alternative considered but eliminated that would limit mechanical treatments to 16 inches d.b.h. as a means to protect large trees (DEIS, pp. 58-61).

The DEIS included a process (appendix D) that addressed large tree retention during project implementation. The large tree implementation plan (LTIP) provides guidance on how to conserve and promote large (young) trees in order to increase age classes that are under-represented (while moving towards the desired condition of having uneven-aged forest conditions).

In response to comments on the DEIS, the implementation plan now emphasizes that when outside of the wildland urban interface (WUI) restoration treatments in goshawk habitat would focus on the removal of small diameter trees and would emphasize large trees retention to move towards deficit stand structure, where applicable. This would be accomplished by placing an emphasis on creating regeneration openings and interspace in areas where vegetation structural class 3 and the smaller VSS 4 trees dominate. The placement of tree groups reserved for retention would focus on areas where the largest trees are already aggregated. These groups would generally range between 0.25 and 1 acre in size. This would result in stands being composed of larger tree groups of larger trees intermixed with relatively small openings. In stands with a preponderance of large young trees the treatment intensity would be managed to the lower end of the available spectrum. Management in these stands still recognizes the need to create regeneration openings to be able to promote uneven aged stand conditions.

In addition, in response to questions raised and comments made on the DEIS about treating less aggressively and leaving more large trees, canopy cover would be measured at the stand level on about 38,256 acres where there is a preponderance of VSS 4, 5 and 6.

Topic 2-5: Old and Large Tree Protection: Approximately 19 comments (CARA 76, 89, 95, 98, 151, 155, 158, 162, 165, 169, 174, 175, 180, 184, and 196-200) and approximately 56 form letters (CARA 19 – form master) stated it was unclear how old and large trees would be protected. Comments indicated the proposed actions did not adequately protect old trees and promote large trees. Also see topic 2-1 (heterogeneity).

Response: The DEIS included specific treatment designs that manage for the sustainability of old trees in appendix D (implementation plan) on pages 613-629, 631-637, 639 to 641. Examples of treatment design include: “Treatments are designed to manage for old age trees in order to have and sustain as much old forest structure as possible across the landscape. Treatments would follow the old tree implementation strategy and old trees would not be targeted for cutting. Live conifer trees with existing cavities, dead tops, and lightning scars would also be favored for retention” (page 627). Page 627 of the plan also states, “Retain all pre-settlement trees and the largest post-settlement trees that most closely resemble old trees in size and form as replacement trees adjacent to pre-settlement tree evidences at a 1:1 ratio. Some younger trees would also be retained to maintain uneven-aged structure. A higher leave tree to evidence ratio may be required to maintain the desired tree cover range” .

The vegetation analysis disclosed post treatment impacts to old and large trees on pages 140 of the DEIS: “Restoration treatments proposed in alternatives B, C , and D are designed to manage for old age trees in order to have and sustain as much old forest structure as possible across the landscape. Old trees would not be targeted for cutting. Reference the old tree implementation plan in appendix D of the DEIS. The analysis presented for Mexican spotted owl indicates the post-treatment distribution of size classes has good representation in the 18- to 24-inch size classes in all habitats. Stocking in the 24-inch plus size class would have good representation in the

restricted other habitat and would be underrepresented in the target/threshold habitat. The goshawk analysis indicates that mature and old forest structural stages that are currently underrepresented would trend toward improved representation in all habitats. Treatments within areas currently allocated old growth would maintain existing old growth structural attributes and would be managed to move toward those conditions over time. The ponderosa pine old growth analysis above indicates old growth structural attributes would continue to develop and improve across the landscape. The forest health discussion presents that the overall sustainability of the ponderosa pine forest would be improved across the landscape including the large/old tree component".

In response to comments on the DEIS, the purpose and need in chapter 1 was edited to include more language on CFLRA requirements (a focus on smaller diameter trees) and a large tree desired condition section. The implementation plan (appendix D) was updated to add consistency checks to CFLRA. See the annual implementation checklist and NEPA, NFMA, ESA and CFLRA Act compliance evaluation tables. Additional design features were added to clarify when large, young trees would be cut. An example of the language can be found in the goshawk landscapes outside of goshawk post-fledging areas WUI55, UEA 40, UEA 25 and UEA 10 section.

In response to feedback and comments received on treating less aggressively and leaving more large trees, canopy cover would be measured at the stand level on about 38,256 acres of goshawk habitat where there is a preponderance of VSS 4, 5 and 6.

Topic 3: Herbicide Use and Prescribed Fire Emissions

Topic 3-1: Use of Herbicides: Commenters (CARA 8 with attachments 9a [CARA 220], and 18 [CARA 223]), 153 and 183) recommended no herbicides be used to treat non-native invasive weeds due to the potential effects to human health and biotic resources. Commenters stated the DEIS did not adequately address the impacts associated with the use of herbicides.

Response: This comment was categorized as being already decided by a previous analysis. The effects of herbicide use were analyzed and disclosed in the Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds (2005) for the Kaibab and Coconino NFs. The analysis was incorporated into the Coconino NF Forest Plan as Amendment 20. In the **previous** Kaibab NF Forest Plan, the analysis and decision had been incorporated as amendment 7. This analysis tiers to the noxious weeds FEIS and decision.

The Noxious or Invasive Weed EIS evaluated the impacts of glyphosate based herbicides and proposed restrictions on the use of these chemicals within limited spray zones (buffers around human habitation and recreation sites), near water and other critical wildlife habitat areas. Restrictions and extra protective measures are outlined in the Appendix B - Design Features, Best Management Practices, Required Protection Measures, and Mitigation Measures of the weed EIS. BMP B15 (DEIS, page 567) incorporates the weeds mitigation measures (appendix B of the weed EIS) in their entirety. The DEIS (page 256) references the incorporation of Appendix B of the Weed EIS into Forest Plan Amendments 20 (CNF) and 7 (KNF). In the FEIS, this language has been updated to reflect a new Kaibab NF Land and Resource Management Plan (USDA FS 2014). While the direction provided in the noxious weeds FEIS still provides direction, it is no longer incorporated into the forest plan.

Topic 3-2: Prescribed Fire Emissions: Approximately 22 comments (CARA 6, 11, 18, 22, 83, 88, 93, 104, 106, 112, 116 - 117, 119, 123,126, 128 – 131, and 159 - 161,) recommended using no prescribed fire due to fire-related emissions and concerns related to public health. This issue was categorized as key in the DEIS (chapter 1, Issue 1).

Response: The DEIS included an alternative that would have eliminated the use of prescribed fire and utilize other methods (DEIS, Eliminate the Use of Prescribed Fire, p. 54). The alternative was considered but eliminated from detailed study because it would not meet various elements of the purpose and need (see DEIS, page 54-56). It would be possible to use mechanical treatments to move biomass offsite and reduce some surface fuels that would have been burned and produced smoke. However, mechanical treatment would not replace the role fire has in improving vegetation composition and diversity on: (1) 59,391 acres of existing grasslands, (2) over 56,000 acres of ponderosa pine with a savanna or grassland reference condition, (3) grassland inclusions within 308,000 acres of ponderosa pine forested areas, (4) 5,261 acres of pine-sage, (5) 1,471 acres of aspen, and (6) thousands of acres where Gambel oak exists within the pine forest. Additional rationale on why the alternative was considered but eliminated is located in the DEIS at page 56.

In response to the concern over emissions from prescribed fire, Alternative D was developed. Alternative D decreases the acres that would receive prescribed fire by over 60 percent when compared to alternative B (proposed action) (DEIS, page v).

The DEIS describes mitigation and design features that would be used to reduce emissions from prescribed fire including:(1) Reducing the emissions produced for a given area treated, (2) Redistributing/ diluting the emissions through meteorological scheduling and by coordinating with other burners in the airshed. Dilution involves controlling the rate of emissions or scheduling for dispersion to assure tolerable concentrations of smoke in designated areas, and (3) Avoidance uses meteorological conditions when scheduling burning in order to avoid incursions of wildland fire smoke into smoke sensitive areas (DEIS, FE9, page 570).

Prescribed fire (pile, broadcast, and jackpot burning) would occur in accordance with Arizona Department of Environmental Quality (ADEQ) requirements. Coordination with ADEQ would take place through the Kaibab and Coconino NF Zone Dispatch Center and the prescribed fire Burn Boss (DEIS, FE2, page 568). Emission reduction techniques (ERTs) that are recommended by Arizona ADEQ would be utilized when possible to minimize impacts to sensitive receptors (including communities) of burn unit(s) (DEIS, FE3, page 568).

The following emission reduction techniques would be used when practicable to minimize impacts to sensitive receptors: pre-burn fuel removal, mechanical processing, increased burning frequency, aerial/mass ignition, high moisture in large fuels, rapid mop up, air curtain incinerators, burn before greenup, backing fire, maintain fire line intensity, underburn before litterfall, isolating fuels, concentrating fuels, mosaic/jackpot burning, moist litter and duff, burn before large activity fuels cure, and utilize piles (DEIS, FE8, page 569). In addition to prescribed fire, the 4FRI is proposing over 388,000 acres of mechanical treatments (DEIS page 40). On the majority of these acres, there would be little slash available for burning which means reduced emissions.

The DEIS (pp. 166-173) and the FEIS (chapter 3) addresses and discloses impacts from prescribed fire as required by the Clean Air Act which establishes National Ambient Air Quality Standards (NAAQS) for six principal pollutants that pose health hazards: carbon monoxide (CO), lead, nitrogen dioxide, particulate matter less than 10 microns in size (PM10), particulate matter less than 2.5 microns in size (PM2.5), ozone, and sulfur dioxide. The DEIS at page 169 addresses regulatory requirements, “Prescribed fire is implemented only with approved site specific burn plans and with smoke management mitigation and approvals. All burning is conducted according to ADEQ standards and regulations. These standards include the legal limits to smoke emissions from prescribed burns as imposed by Federal and State law. The ADEQ enforces these laws by

regulating the acres that are treated based on expected air impacts. These regulations ensure that effects from all burning meet Clean Air Act requirements. Prescribed fires are initiated under conditions that allow managers to meet both control objectives (fire behavior) and resource objectives (fire effects, including air quality impacts)". The information disclosed in the environmental consequences of the DEIS and FEIS provide the Responsible Officials and the public with sufficient and relevant information to evaluate the potential adverse effects to the human environment from prescribed fire per CEQ Sec. 15022.22 (b) 3. The disclosure of impacts related to potential emissions from prescribed fire is consistent with CEQ Sec. 1502.22 (b) 4.

Responses to the DEIS raised the issue of mercury as a potential emission from prescribed fire. In the FEIS, the water quality report includes an assessment of the potential for mercury to affect the Lake Mary watershed because the Lake Mary total maximum daily loads (TMDL) indicates the major source of mercury in the Lake Mary Region (LMR) is atmospheric deposition with some mercury originating from natural geologic materials (primarily from former volcanic activity). The analysis concludes specific BMPs (see FEIS appendix B) would minimize or mitigate the potential for mercury to be mobilized in sediment and delivered to water bodies (Water Quality and Riparian Report, pp. 54-55).

The FEIS fire ecology report includes a discussion on mercury and emissions. Experts at the Environmental Protection Agency (Region 9), the Agency's liaison to the Arizona Department of Environmental Quality, and the Agency's Washington Office were contacted in order to consider the best available information. Overall, after reviewing available literature (Selin 2009, Obrist et al. 2008, Biswas et al. 2007, Wiedinmyer and Friedli 2007, Friedli et al. 2003) and consulting the Environmental Protection Agency (Jason Gerdes, personal communication 3/11/2014) and the Agency's Washington Office Air Quality lead (Peter Lahm, personal communication 3/11/2014) and the USFS's liaison to the Air Quality Division of the Arizona Department of Environmental Quality (Ron Sherren, personal communication 3/11/2014). Information available for analyzing the potential for mercury emissions as a result of prescribed fire is considered to be incomplete and unavailable relevant to determining reasonably foreseeable adverse impacts to the human environment as directed by CEQ Sec. 1502.22 (b) 1.

Topic 4: Wildlife and Its Habitat

Topic 4-1: Adverse Effects to Mexican spotted owl: Approximately 9 commenters (CARA 24, 107, 137, 180, and 196-200) stated that the level of treatment and acres of treatment within Mexican spotted owl habitat was excessive and would result in uncertainty in terms of how Mexican spotted owl and its habitat would be affected. Some commenters stated all action alternatives (via forest plan amendments) would remove forest plan monitoring requirements to the detriment of the species. Some commenters concluded the analysis was not compliant with the 2012 (revised) Mexican spotted owl Recovery Plan.

Response: The DEIS states that treatments in alternative C (preferred alternative), "includes recommendations from the U.S. Fish and Wildlife Service (FWS) by increasing prescribed burning treatments within protected Mexican spotted owl habitat (to improve the quality of owl roosting and nesting habitat), and aligning treatments in threshold habitat with the "Mexican Spotted Owl Recovery Plan, First Revision" (USDI FWS 2012) (DEIS, page 47). Alternatives B-D included forest plan amendments. In response to comments on the DEIS, an alternative that proposes no forest plan amendments was developed (alternative E). In the FEIS, each resource discloses the effects associated with omitting plan amendments.

Additional analysis has been added to the FEIS. A summary in chapter 2 on the environmental consequences for Mexican spotted owl habitat states, “In Mexican spotted owl nesting and roosting habitat, there would be no change between alternatives A-E in percent of openness. The percent openness (degree of heterogeneity) would remain the same as the existing condition. This is because thinning treatments would limit the removal of the overstory structure. In alternative A in Mexican spotted owl restricted (all) habitat, the percent of openness would remain the same as in the existing condition. Existing interspace would continue to be encroached upon by expanding tree crowns and ingrowth. In alternatives B through E there would be little change in the very open to open categories”.

In Mexican spotted owl protected habitat, several of the forest metrics are similar across alternatives in 2020 because minimal actions are proposed in PACs. Thinning, (not group selection) is proposed in PACs, in part to limit affects to overstory structure The percent of stand density index max would decrease in all alternatives as a result of the proposed thinning. PACs would still remain in the highest density category (“extremely high density”), although alternative C would move the percent of maximum stand density index to the bottom of this category in 2020, almost achieving a “high density” ranking (high density equals percent maximum stand density index of 55 and lower). The potential decrease in crown fire risk is most prominent in alternative C, and alternative D makes the least change relative to the no action alternative. Implementing two prescribed fires would decrease surface fuel loading and increase canopy base height. The reduction in surface fuel loading would decrease the potential surface fire flame lengths. The higher canopy base height would mean it would take longer flame lengths to initiate crown fire. These two changes decrease the potential of high severity fire effects.

Alternative D is the only (action) alternative where at least 30 percent of the habitat would return to fire regime condition class (FRCC) 3, contrary to the purpose and need. A key result of these treatments would be increases in the percent of trees 24 inches d.b.h. and greater. Alternatives B-D would increase the density of this size-class the most. A similar pattern is evident among alternatives for trees in the next largest size-class (18 to 23.9 inches d.b.h.). Growing trees into the largest size-classes takes time and creating more large trees would be an important contribution to nesting and roosting habitat. Decreasing competition around presettlement trees should enhance their survival and overall health and potentially result in more large trees than displayed in the model results. Reducing abundant quantities of mid-sized trees and increasing areas dominated by large trees should improve Mexican spotted owl nesting and roosting habitat (USDI FWS 1995, May and Gutierrez 2002, May et al. 2004, Blakesley et al. 2005).

The biological assessment for the project was submitted to the FWS in February of 2014. The biological assessment concluded long-term effects of the 4FRI should be beneficial to Mexican spotted owls by enhancing key habitat components for Mexican spotted owl and their prey. The likelihood of maintaining Mexican spotted owl habitat into the future is also enhanced by reducing the predicted risks from climate change-induced changes in temperature and precipitation patterns. However, there is potential for short-term adverse effects to owls and their habitat (Noble 2014). Because of the short-term risks of adverse effects, the project “may affect and is likely to adversely affect Mexican spotted owls and their habitat, g critical habitat”, (Biological Assessment, pp. 238-239). The FWS biological opinion (AESO/SE 22140-2011-F-0145), which was signed by the FWS on October 20 , 2014 affirmed this effects determination. The FWS found the selected alternative will not jeopardize the continued existence of the Mexican spotted owl, and will not destroy or adversely modify its designated critical habitat (USDI FWS 2014, page 33).

Topic 4-2: Adverse Effects to Northern Goshawk: Approximately 8 commenters (CARA 107, 137, 180, 196-200) stated that the level of treatment and acres of treatment within goshawk habitat was too intense and would result in fragmentation of the habitat and cause a decline in the species.

Response: Post treatment landscape openness in goshawk habitat was presented as issue 3 in the DEIS. In the DEIS, the analysis of goshawk habitat components is located on pages 126 to 133 of the DEIS.

In response to comments on the DEIS and to address changes since the DEIS was published, the goshawk analysis was revised and additional analysis has been added to the FEIS. A summary in chapter 2 on the environmental consequences for goshawk includes the following effects:

- Alternative A would not improve habitat quality, resiliency and sustainability. In all goshawk habitat, no action results in the habitat being at highest risk of increasing densities, increased fire risk, and increased to insect and disease risk. These results are contrary to forest structure, forest health, and resiliency and function desired conditions.
- Mechanical treatments in alternatives B, C, and-D would improve age-class diversity and move towards more open, uneven-aged conditions. The percent of stand density index max would decrease in all action alternatives as a result of the proposed thinning. The percent of stand density index max in landscapes outside of goshawk post-fledging areas habitat would decrease to the high end of moderate density in alternatives B and C and decrease to high density in alternatives D and E in the short term (2020). All action alternatives would shift or remain in high density by 2050. Primary benefits from these changes in forest structure are that the risks of large scale loss of habitat from disturbances such uncharacteristic fire, bark beetles, and density-related mortality would be reduced.
- Trees greater than 24 inches d.b.h. in uneven-aged forest structure would increase as a result of these treatments in all alternatives. Alternatives B and C would increase the distribution of this size class to 20 percent of the area by 2020 whereas alternative D would increase to 15 percent, and alternative E would increase to 18 (from an existing distribution of 11 percent). In alternative A increases the percent to 13 by 2020. Trees greater than 24 inches d.b.h. in even-aged forest structure would increase to 4 percent in alternatives B and C; 3 percent in alternative D; 2 percent in alternative E; and not change in alternative A (from an existing level of 1 percent).
- Alternatives D and E would increase the distribution of trees in the next largest size-class (18 to 23.9 inches d.b.h.) in uneven-aged condition to 28 percent; alternative C would increase the distribution to 30 percent and would increase to 29 percent in alternative E. In comparison, alternative A decreases the percent in 2020 to 12 percent but increases by 2050 to 27 percent. In even-aged forest structure, this next largest size class would increase to 22 percent in alternatives B and C, increase to 19 percent in alternative D and increase to 18 percent in alternative E, from an existing level of 8 percent. In alternative A, there is an increase of 21 percent by 2050. Growing trees into the largest size-classes takes time and creating more large trees would be an important contribution to prey and foraging habitat.
- Substantial increases in the average pounds per acre of understory biomass in all action alternatives would improve cover and food for birds and mammals preyed upon by goshawks as well as the invertebrates that are an important food source for goshawk prey. Alternatives B and C would have the most improvement followed by alternatives E, then D. This would also favor conditions conducive to the spread of low severity fire rather than crown fire. Crown fire would have more severe effects to vegetation and soil. Prey habitat would

improve as coarse woody debris increases to desired conditions by 2050. In the short term, tons per acre of coarse woody debris would fall below desired in alternatives B, C, and E. Only alternative D would meet desired conditions in the short term (2020). Alternative A, since there are not treatments proposed, would be at the highest risk of increasing densities, increased fire risk, increases to insect and diseases, and increased risks to goshawk landscapes outside of goshawk post-fledging areas habitat.

In response to feedback and comments received on treating less aggressively and leaving more large trees, in alternatives C and E canopy cover would be measured at the stand level on about 38,256 acres of goshawk habitat where there is a preponderance of VSS 4, 5 and 6.

In the wildlife report that has been prepared for the FEIS, the determination of effect for goshawk for the preferred alternative states, "Implementation of alternative C may impact individuals, but is not likely to cause a trend to federal listing or loss of viability" (Wildlife Report, page 473, FEIS, chapter 3).

Topic 4-3: Habitat Fragmentation: One commenter (CARA 217 (Opposing View Attachment 4) and 224 (Opposing View Attachment 1) stated that road construction, salvage logging, and clear-cutting timber operations would fragment the habitat of many wildlife species including Ovenbirds, grizzly bears, martens, and fishers, among other species.

Response: Issues related to salvage logging were considered to be outside the scope of this analysis as no salvage is being proposed. The purpose of the project is to reestablish and restore forest structure and pattern, forest health, and vegetation composition and diversity (DEIS, page 9). The wildlife biologist for the project reviewed the comments and literature provided and found an unpublished paper that discusses the effects of habitat fragmentation had been submitted. The project does not have any prescription that proposes clearcuts. The DEIS discusses habitat connectivity for wildlife species on page 174. The complete analysis for bridge habitat for canopy-dependent wildlife can be found in appendix G of the DEIS and appendix 3 of the wildlife report. The terrestrial wildlife specialist report discloses habitat fragmentation for wildlife species in several areas: page 120 for four spotted skippling; page 144, 585 and 592 for pronghorn; page 176 discusses climate change and habitat fragmentation; page 194 for the Mexican spotted owl; page 375 for nitocris fritillary; page 380 for Navajo Mogollon vole; page 385 for long-tailed vole; page 386 for the drawf shrew; page 388 for the Merriam's shrew; page 521-523, 634, and 674 for effects to understory species. Habitat effects could be similar to those that would occur with severe wildfire and could ultimately lead to habitat fragmentation or vegetation type conversions (DEIS, chapter 1). A portion of the article discusses buffers. Part of the topic description as presented by the commenter implies the paper addresses the specific use of clearcutting – which is not relevant to this project.

Topic 5: Soil and Water

Topic 5-1: Clarification and Corrections: Some comments requested clarification on the watershed research and suggested clarification or correction language for the FEIS and final reports (CARA 98, 151, 155, 162 and 166).

Response: As requested, the water quality and soils report made corrections (to affected watersheds) and revised the language related to the watershed research. The FEIS (chapter 1 and 2) reflects the recommendations and corrections.

Topic 5-2: Adverse Impacts to soil and water resources: Some comments (approximately 10) stated new road construction and ground-based logging may significantly impact soils and water quality; therefore, soil and water impacts are a significant issue for the EIS (CARA 180, 196-201,

217 and 224). Some opposing views included literature from other geographic locations including Michigan and the northwest (CARA 8). Some comments (CARA 8) included (popular not peer reviewed) science that suggested the project (timber harvest and road actions) would result in high soil erosion due to debris slides.

Response: The potential impacts to soil and water resources would not result in significant environmental effects. Therefore, it was not categorized as a "significant" issue. The project has been designed to maintain soil productivity and function and meet the Clean Water Act (routine disclosures).

Chapter 3 of the DEIS disclosed the affected environment for each resource (including roads) and the direct/indirect environmental consequences associated with the action alternatives in chapter 3, from page 105 to page 332 . Effects analysis of roads (transportation) can be found in the DEIS on pages 318-321. Table 31, chapter 2, page 96 of the DEIS provides a comparison of the predicted effects of proposed treatments by alternative. The best (and relevant) available science, information, first-hand knowledge of the resources within the project area and experience with past and similar projects informed the effects analysis.

The DEIS included design features, mitigation measures and the following soil and water BMPs in appendix C, page 565 of DEIS. These features would be implemented (for temporary road construction) to maintain and protect soil productivity, minimize sediment delivery and improve and protect water quality. The chapter 3 soil and water analysis (DEIS, table 32) and the soils specialist report (pp. 62-92 and attachment 1, page 165) show less than 15 percent soil disturbance would occur (including temporary road construction) under all action alternatives. The alternatives would not exceed the 15 percent soil disturbance threshold that has been identified as maintaining long term soil productivity.

No new permanent roads would be constructed for this project. Temporary roads would be constructed to provide necessary access for forest treatments and decommissioned after use. The effects of roads are analyzed and disclosed in chapter 3 of the DEIS. Appendix C provides design features, BMPs, and mitigation measures to protect soils and water quality as they relate to roads. The Riparian and Water Quality Specialist's Report provides a detailed description of the effects of forest roads on page 50 and 62-64.

In response to comments on the DEIS, a new design feature which addresses activities on soils with severe erosion hazard was developed. Design feature SW43 (FEIS appendix C) was developed to protect long-term soil productivity and water quality: "Provide soil and site protection on newly disturbed soils located on temporary roads on soils with severe erosion hazard as needed. Avoid locating temporary roads on soils with severe erosion hazard. Where unavoidable, provide soil protection through implementation of any of the following methods to control sediment and protect water quality. Methods may include, but are not limited to: wattling, hydromulching, straw or woodshred mulching, spread slash, erosion mats, terraces, blankets, mats, silt fences, riprapping, tackifiers, soil seals, seeding and side drains, and appropriately spaced water bars or water spreading drainage features. Temporary roads would be decommissioned and protected with any of the above methods". A new design feature was developed (FEIS, appendix C) to clarify temporary roads would be decommissioned by the purchaser/contractor when mechanical treatments are finished using the adaptive management actions listed in appendix A of the Transportation Specialist report.

Soil and site productivity can be negatively affected if protective design features and best management practices are not made part of the action. The 4FRI project minimizes vegetation treatment impacts to soil and site productivity through implementation of design features, mitigation measures and the following soil and water BMPs listed and located in appendix C of the DEIS. They have been developed and will be implemented (for timber harvest and fuels operations and retention of coarse woody debris) to maintain and protect soil productivity, minimize sediment delivery and improve and protect water quality. The chapter 3 soil and water analysis (and soils specialist report) shows less than 15 percent soil disturbance (average at the watershed level) would occur (including temporary road construction) under all action alternatives which is less than 15 percent soil disturbance threshold identified that would maintain long term soil productivity.

Topic 6: Opposing Science

Some comments (CARA 148 and 149) stated the DEIS failed to consider new science for Mexican spotted owl and wildland fire and fire regime condition class (FRCC). One comment (CARA 8 with attachment 221) stated the DEIS failed to adequately address the latest science regarding the sufficiency of only treating in the wildland urban interface. Approximately three form letters (Cara 109 is the master form letter) questioned the best available science used to evaluate potential impacts from climate change. The complete response to the comments and questions on climate-related science is in the fire ecology report in appendix H. The complete response to CARA 109 is in the project record.

Response: Only a summary response is provided here. Each resource evaluated all literature submitted as part of comment letters. A complete review of the science is included in the individual response report and in the specialist reports. An opposing science discussion by resource (as applicable) is presented in chapter 3 of the FEIS.

A few commenters (CARA 148, 149, 8 with attachments, 183 and 153) cited publications that suggest that crown fire was historically much more prevalent in the project area, even in ponderosa pine, than is concluded in the DEIS and in the specialists' reports, in particular the Fire Ecology, Silvicultural, and Wildlife Reports (Williams and Baker 2013, Williams and Baker 2012). One of the assumptions which is used to make this claim is that the science supporting frequent, low severity fires, is based on "small, scattered studies". In fact, the Fire Ecology report cites over 25 studies that are specific to the project area, and about 50 additional studies that specifically include the rest of Arizona and/or the southwest. Included is a 110 page General Technical Report (Dahms and Geils 1997), that completed an assessment of forest ecosystem health in the southwest, and an 85 page report by The Nature Conservancy (Smith 2006) on historical and current landscape conditions for ponderosa pine in the southwest. The preponderance of science does not agree with Williams and Baker, and was soundly refuted by Fulé et al. (2013). Fulé et al. (2013) has 18 co-authors, including many of the leading researchers of fire ecology in southwestern United States. Reconstructions of dry western U.S. forests in the late 19th century in Arizona, Colorado and Oregon based on General Land Office records were used by Williams and Baker (2012) to infer past fire regimes that had substantial moderate and high-severity burning. They concluded that the patterns of present-day large, high-severity fires are not distinguishable from historical patterns. Fulé et al. (2013) presented evidence of important errors in their study. First, the use of tree size distributions to reconstruct past fire severity and extent is not supported by empirical age–size relationships nor by studies that directly quantified disturbance history in these forests. Second, the fire severity classification of Williams and Baker (2013) is qualitatively different from most modern classification schemes, and is based on different types of data, leading to an inappropriate comparison. Third, while Williams and Baker

(2013) asserted 'surprising' heterogeneity in their reconstructions of stand density and species composition, their data are not substantially different from many previous studies which reached very different conclusions about subsequent forest and fire behavior changes. Contrary to the conclusions of Williams and Baker (2013), the preponderance of scientific evidence indicates that conservation of dry forest ecosystems in the western United States and their ecological, social and economic value is not consistent with a present-day disturbance regime of large, high severity fires, especially under changing climate (Fulé et al. 2013).

Many papers cited by commenters objecting to mechanical treatments attempted to apply the ecology and/or fire regimes of ecosystems other than ponderosa pine (mixed conifer, spruce fir) or ponderosa pine in the northwest (Northern California, Oregon, Idaho). Ponderosa pine has distinct variations within its geographic range (Oliver and Ryker 1990), and the populations of ponderosa pine in northern Arizona have some fundamental genetic differences from pines in other areas within the range of Ponderosa species (Conkle and Critchfield 1988). There are differences in the openness of crown growth, number of needles, and other characteristics. These two populations would not be expected to have identical fire regimes, even if the study was restricted to ponderosa pine.

There were multiple comments from people objecting to 'fuels treatments', 'hazardous fuels treatments', and/or 'fuels project/s' (CARA 8, 180). Ecosystem restoration treatments and fuel treatments are not synonymous. Some ecosystem restoration treatments reduce fuel hazard, but not all fuel treatments restore ecosystems. Ecosystem restoration treatments are often designed to recreate presettlement fire regimes, stand structures and species compositions while fuel treatment objectives are primarily to reduce fuels to lessen fire behavior or severity—this is known as 'hazard reduction' (Reinhardt et al. 2008).

Finney (2001, 2007), and Finney et al. (2007) focused on 'fuels management', which is appropriately used for managing fire behavior when that is the primary concern. However, treating only 20 percent of the landscape, which Finney has shown can be effective in managing fire behavior, would not achieve ecosystem restoration on a landscape scale. An analysis that focuses on where treatments would best minimize fire behavior, may or may not support restoration objectives across the landscape (which include conservation of large and old trees, enhancing large oak, enhancing aspen clones, and other treatments).

Of the 586,110 acres proposed for treatment in this EIS, there are about 535 acres of proposed wildland-urban interface (fuels) treatments. All of the 535 are contiguous and are in restoration unit6 adjacent to the town of Tusayan. With the exception of these acres, the objectives of this EIS are restoration, not hazardous fuels reduction.

One commenter (Cara 8) made multiple references to the work of Jack Cohen (Cohen 1996-2001, 2003, 2008) and related papers. Cohen's research generally addresses concerns about structure protection, as evidenced by the titles of the 9 Cohen papers referenced by the commenter:

- Reducing the Wildland Fire Threat to Homes: Where and How Much (1999)
- Examination of the Home Destruction in Los Alamos Associated with the Cerro Grande Fire (2000)
- Preventing Disaster – Home Ignitability in the Wildland-Urban Interface (2000)
- What is the Wildland Fire Threat to Homes? (2000)
- Thoughts on the Wildland-Urban Interface Fire Problem (2003)

- The Wildland-Urban Interface Fire Problem: A Consequence of the Fire Exclusion Paradigm (2008)
- Modeling Potential Structure Ignitions from Flame Radiation Exposure with Implications for Wildland/Urban Interface Fire Management (1996)
- Structure Ignition Assessment Can Help Reduce Fire Damages in the wildland-urban interface (1997)
- Saving Homes from Wildfires: Regulating the Home Ignition Zone (2001)

We reviewed all these papers, and found the relevancy in these papers was limited to that portion of the 4FRI treatments (~535 acres) that have a fuels/ wildland-urban interface focus, and how that treatment would be expected to decrease the intensity of a wildfire approaching a wildland-urban interface area.

On those ~535 acres where the proposed treatments are actually fuels treatments, the treatments proposed align with the suggestions here that 'fuels treatments' should focus on creating conditions in which fire can occur without devastating consequences, rather than on creating conditions conducive to fire suppression. There was no new information or information that could otherwise inform the analysis. In summary, treating only wildland-urban interface areas would not meet the purpose and need for restoration and the request to create an alternative was considered to be beyond the scope of the 4FRI and not reasonable enough to warrant alternative development.

Climate Change: The first contention stated the use of Woods et al. (2012) was not valid because the literature was an unpublished report. The final report was issued later in 2013, with no changes in conclusions, and the reference has been updated in the final report. Reviews and syntheses of multiple research studies have always been a valuable source of information. Combining and/or comparing multiple datasets in one document can produce added value because the studies can be viewed in context with others, and the combined data sets may strengthen or weaken conclusions from the individual studies, and/or produce new conclusions by remixed data and conclusions. Woods et al. (2012) took data and results from published studies (mostly from northern Arizona) and synthesized a new study to estimate the potential for restoration efforts (4FRI in particular) to mitigate the risk of catastrophic wildfire and stabilize carbon storage in ponderosa pine forests. The study specifically addressed the area proposed for treatment by the 4FRI, so is pertinent. This report is available upon request and is in the project record.

A second contention in the form letter was that Hurteau and North (2009) was not a relevant study to the project and the conclusions not consistent with the project analysis because the 4FRI DEIS did not consider soil carbon. The commenter found the conclusions and assumptions in this paper questionable. However, no specifics were provided that would assist with a response.

The stated purpose of this study was to "determine if current aboveground forest carbon stocks in fire-excluded southwestern ponderosa pine forest are higher than pre-fire exclusion carbon stocks reconstructed from 1876, quantify the carbon costs of thinning treatments to reduce high-severity wildfire risk, and compare post treatment (thinning and burning) carbon stocks with reconstructed 1876 carbon stocks." This study is not cited in the DEIS or in the Fire Ecology report as a reference for the idea that 'burning a forest turns it into a carbon sink', though it does point out that high severity fire can turn a forest into a carbon source. It is cited to support the statement (which we agree with) that fire-excluded forests contain more carbon that non-fire excluded

forests. It also supports the idea that these forests are at greater risk of high-severity fire than non-fire excluded forests.

The third contention stated Savage and Mast (2005) was cited in the DEIS to support of a statement about carbon emissions but the study does not even contain the word "carbon." The fire ecology analysis cited Savage and Mast to describe potential effects from high severity fire. On page 251 of the fire ecology report states, "Savage and Mast (2005) showed that these conditions can persist for decades". The integrity of a forest structure and species composition (Savage and Mast 2005) is relevant to carbon sequestration and climate change dynamics.

The fourth contention stated Finkral and Evans (2008) data was not relevant to the 4FRI analysis because "Their study area was near Flagstaff, in the region of this project, and they estimated a 2.8 percent annual risk of fire in the area. This is a 36-year fire rotation, contradicting the frequent-fire assumption that the Forest Service is using to justify burning the area every 5 years".

Finkral and Evans discuss some of the research that has been done on restoration and carbon sequestration, and point out that "…dense forests have become a sink for carbon and an offset to the rising concentrations of greenhouse gases in the atmosphere…', but conclude that in a stand-replacing fire, a thinned stand would release 2410 kg C ha_1 less to the atmosphere than an untreated stand. However, the thinning treatment resulted in stand structural changes that make the stand less likely to support a crown fire and therefore more likely to avoid the carbon releases associated with crown fires, even under extreme fire conditions. So the decrease in C released would be even lower. The 2.8 percent number includes all the successful suppression efforts over the 15 years used to calculate the annual risk (1986 – 2000), and only included fires over 50 acres. The actual number of ignitions is much greater than that, and forest conditions that support high severity/high intensity fire have increased in the 14 years since the (Sisk et al. 2004) study was completed. It is unclear where the 'every 5 years' number comes from. Regardless of the source, fire rotation and 'every 5 years' are not the same thing. Fire rotation is the length of time necessary for an area equal to the entire area of interest to burn. Fire return interval (implied by 'every 5 years') is the period of time between fires at a given point, or the arithmetic average of all fire intervals in a given area over a given time period. The 4FRI analysis does not discuss fire rotation, as it is not relevant to the analysis. The preferred average fire return interval in the ponderosa pine in the project area is 10 years. This is supported by the preponderance of published scientific literature (see Fire Ecology Report pg. 48).

A final contention related to using Baker 2009 and Campbell 2012 in the context of fuel treatments. Regarding Baker (2009), if all else is the same (surface fuel loading, etc.), we agree there can be more intense fire in an area that is thinned. The following is from the Fire Ecology report (pgs. 28 – 29): "Reducing canopy fuel loading may increase surface fire behavior because more wind and sunlight can reach the surface, however overall fire behavior is more significant:

"Modifying canopy fuels as prescribed in this method may lead to increased surface fire intensity and spread rate under the same environmental conditions, even if surface fuels are the same before and after canopy treatment. Reducing crown bulk density to preclude crown fire leads to increases in the wind adjustment factor (the proportion of 20-ft windspeed that reaches midflame height). Also, a more open canopy may lead to lower fine dead fuel moisture content. These factors increase surface fire intensity and spread rate. Therefore, canopy fuel treatments reduce the potential for crown fire at the expense of slightly increased surface fire spread rate and intensit. However, critical levels of fire behavior (limit of manual or mechanical control) are less likely to be reached in stands treated to withstand crown fires, as all crown fires are uncontrollable. Though surface intensity may be increased after treatment, a fire that remains on

the surface beneath a timber stand is generally controllable" (Scott 2003). However, following prescribed fire, surface fuel loading would be lower, effectively decreasing the potential fire intensity."

Campbell et al. 2012 evaluated the effects of fuel treatments and wildfire on forest C stocks. With the exception of 535 acres of fuel reduction in a wildland-urban interface area, the 4FRI is proposing restoration treatments, not fuel treatments. They state: "…removing fine canopy fuels (i.e. leaves and twigs) practically necessitates removing the branches and boles to which they are attached, conventional fuel-reduction treatments usually remove more C from a forest stand than would a wildfire burning in an untreated stand". The treatments proposed in the 4FRI are not at all 'conventional fuel-reduction' treatments. They are restoration treatments which are designed to produce and/or promote multi-story/multi-age stands.