

**Four-Forest Restoration Initiative, Coconino and Kaibab National
Forests Environmental Impact Statement
August 2011 Scoping Content Analysis – Phase 2
Scoping Report, June 10, 2012**

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Summary of Public Involvement, Issues, and Alternative

The project was posted in the Coconino and Kaibab National Forests' (NF) Schedule of Proposed Actions (SOPA) in January of 2011 and the Notice of Intent (NOI) to prepare an environmental impact statement was published in the Federal Register on January 25, 2011 [FR Doc.2011-1444]. A draft proposed action was sent to a mailing list (hard copy and electronic mail) of 1,331 individuals, local government, state government, federal and state agencies, and organizations. In 2011, five public workshops were held during the comment period and two public meetings were held after the close of the comment period.

A revised proposed action was sent to a mailing list of 213 parties (169 electronic mail and 44 hard copy recipients) and a second 14-day public comment period began with the publication of a second revised NOI in the Federal Register on August 19, 2011 [FR. Doc. 2011-20496]. On August 15, 2011 a revised proposed action was mailed via postal service to 44 mail recipients. On August 17, 2011 the revised proposed action was electronically-mailed to 213 parties. A two-week informal comment period began on August 19, 2011 with the publication of a second revised NOI in the Federal Register [FR. Doc. 2011-20496]. Thirty-four comments were received during the two-week comment period and two comments were received after the close of the comment period (September 4 to September 6, 2011). These comments, in addition to the eight comments received from May 12 to July 26, 2011, were accepted as part of the public involvement process. Less duplicates, 42 comments were addressed in content analysis.

Two open houses were held while the comment period was underway and project updates were provided to local governments and potentially affected residents from September 2011 to December 2011. To address emerging issues and clarify scoping comments, a meeting was held with commenters to discuss the conservation of large trees on October 14, 2011. A meeting to discuss forest plan requirements for goshawk and canopy cover was held with interested parties

on December 15, 2011. Additional details, including Tribal Consultation, will be located in the Public Involvement section in Chapter 1 of the DEIS and the project record.

The interdisciplinary team identified three key issues that focused the analysis or drove alternative development including: Issue 1: Prescribed Burning Smoke, Issue 2: Conservation of Large Trees, and Issue 3: Post-treatment Canopy Cover and Landscape Openness. Additional details will be provided in chapter 1 of the DEIS.

Three alternatives were considered but eliminated from detailed study including: (1) an alternative that would utilize mechanical treatments limited to 8-inch dbh to reduce the potential for crown fire, (2) an alternative that would utilize prescribed fire as the sole treatment method, and, (3) an alternative that would eliminate the use of prescribed fire. Additional information will be available in chapter 1 of the DEIS. Four alternatives were evaluated in detail, including:

- **Alternative A (No Action)** – The no action alternative is required by 40 CFR 1502.14(c). It has been analyzed to contrast the impacts of the action alternatives with the current condition and expected future condition if the proposed action were not implemented. This alternative proposes no restoration treatments.
- **Alternative B (proposed action)** – This alternative would mechanically treat 388,526 acres of vegetation and prescribe burn 587,924 acres. It incorporates comments and recommendations received during an 8-month public involvement period. The alternative incorporates the key components of the stakeholder-created Old Tree Retention Strategy but does not include the stakeholder-created Large Tree Retention Strategy. The alternative includes mechanically treating and prescribed burning a select number of Mexican spotted owl protected activity centers, excluding core areas. Three non-significant forest plan amendments would be required on the Coconino NF and two non-significant forest plan amendments on the Kaibab NF to be in compliance with the forest plans.
- **Alternative C** – This alternative would mechanically treat 434,038 acres of vegetation and prescribe burn 593,211 acres. This alternative was developed in response to comments received to the August, 2011 revised proposed action, including Issue 2, Conservation of Large Trees. The key components of the stakeholder-created Large Tree Retention Strategy and Old Tree Retention Strategy are incorporated into the alternative's design features, monitoring and adaptive management, and implementation plan. The alternative includes wildlife and watershed yield research. The alternative increases the acres to be mechanically treated and prescribed burned and increases the number of select Mexican spotted owl protected activity centers that would be prescribed burned, including core areas. Other actions (springs, seeps, ephemeral streams, aspen protective fencing, and roads) are similar to alternative B. Five non-significant forest plan amendments would be required on the Coconino NF and three non-significant forest plan amendments on the Kaibab NF to be in compliance with the forest plans.
- **Alternative D** – This alternative would mechanically treat 388,526 acres of vegetation and prescribe burn 178,852 acres. This alternative was developed in response to Issue 1, Prescribed Burning Smoke. The acres to be prescribed burned would be limited to grassland vegetation and no prescribed burning would occur in

ponderosa pine or aspen. A select number of Mexican spotted owl protected activity centers would be mechanically treated but not prescribed burned. Other actions (springs, seeps, ephemeral streams, aspen protective fencing, and roads) are similar to alternative B. Three non-significant forest plan amendments would be required on the Coconino NF and two non-significant forest plan amendments on the Kaibab NF to be in compliance with the forest plans.

Other Comments Received in Response to the August 2011 Revised Proposed Action

As noted above, 42 comments (less duplicates) were received by September 6, 2011. Five comments were received well after the close of the comment period. On October 20, 2011, Rick Erman (Friends of Anderson Mesa) requested that authorized livestock and elk grazing (non-native herbivores) be addressed in this analysis. On January 17, 2012 we received a letter from the Physicians for Social Responsibility. The group stated it was necessary to analyze the soil in any potential burn area for radioisotopes prior to the burn, and if a hazard exists, to use other means to reduce the hazard of major fire (grazing, thinning, etc.). On March 4, 2011 Dorothy Holasek requested (via telephone and letter) the forests conduct monitoring to establish the amounts and kinds of radionuclides that could be released from prescribed burning. On April 6, 2012 Ms. Holasek sent a letter requesting the forests conduct a peer-reviewed scientific study to establish the amounts and kinds of radionuclides that could be released from prescribed burning. The letter included several documents for review. A letter dated April 10, 2012 was received from Dorothy Holasek asking for a written response to her 2011 comments on the proposed action (January 2011) and the revised proposed action (August, 2011).

Given that the DEIS is well-underway and the comment period for the August proposed action ended in September of 2011, the 45-day comment period for the DEIS will provide the next opportunity for public comment. At this time, the forests are deferring to Arizona Department of Environmental Quality (ADEQ) as the regulatory authority for monitoring. Rick Erman, the Physicians for Social Responsibility, and Ms. Holasek will be advised to re-submit letters during the upcoming comment period (per 36 CFR 215.6, pursuant to 40 CFR parts 1500-1508). They can request the forests utilize any literature previously provided in other correspondence. A response letter was sent to Mr. Erman. The "other comments" section of this scoping report serves as our response to comments received by Ms. Holasek and the Physicians for Social Responsibility after the close of the comment period.

Comments and Responses

Letter 1-20110512-Sharon Cosentino (Cara Letter #10)

Comment 1: I want to see alternatives to control burning that are initiated as soon as possible. Here in the Verde Valley, all the smoke drifts down no matter which forest is burning. Why do we continue to waste a recyclable product that could better be used for firewood, etc.?

Response: Thank you for your comment. To respond to your concern, design features were developed to reduce the amount of smoke produced from project activities. Design features include improving coordination between forests. In addition, an alternative that significantly reduces the acres to be prescribed burned was developed. In alternative D, the acres to be prescribed burned were reduced from 587,924 (alternative B) to 178,852 acres. The acres that would be prescribed burned in this alternative would occur mostly in grassland vegetation. The

fire ecology, air quality, recreation, and social-economics environmental consequences will disclose the potential impacts to air quality, quality of life, the local and regional economy, and public health and safety. The indicators used to evaluate the smoke issue are: (1) Quantitative smoke emission modeling and qualitative interpretation to evaluate the potential for smoke within communities that are within, or in close proximity to, the project, (2) Modeling of principal pollutants including carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter less than 10 microns in size (PM 10), particulate matter less than 2.5 microns in size (PM 2.5), ozone (O₂), and sulfur dioxide (SO₂) pollutants that pose potential health hazards to evaluate compliance with the Clean Air Act as regulated by ADEQ, and, (3) Social and economic evaluation of impacts to quality of life and tourism.

An alternative that would entirely eliminate prescribed burning within the project area (Coconino and Kaibab NFs) was considered. The alternative would eliminate smoke impacts (from this project only) during certain times of the year when smoke impacts are largely from prescribed fire (pile burning, broadcast burns, and jackpot burning), generally, mid-to-late fall, winter, and early spring. However, the likelihood and degree of potential impacts from wildfire smoke, though less frequent than from prescribed fires, would continue to increase as fuels increase within the forests. The interdisciplinary team (IDT) found that while canopy fuels could be mechanically thinned, maintaining a forest structure that is sustainable could not be achieved by mechanical means alone. See our response in comment 24-4 for additional information on this alternative. The complete discussion for this alternative (considered but eliminated) will be available for review prior to the publication of the DEIS.

Letter 2-20110612 – Pat Shaw (Cara Letter #11)

Comment 2: No comment provided, only name and email information.

Response: Thank you for your interest in 4FRI. Your email and contact information has been added to our mailing list.

Letter 3-20110616 – Tracy Lynn Cook (Cara Letter#12)

Comment 3: I have been trying to look at the various initiatives but cannot open them even with Adobe reader. Please send me copies of these initiatives especially so I can see when and where the meetings for the various initiatives are taking place. Meetings are supposed to take place this week of June 27, 2011 so time is of the essence. Thanks for your help.

Response: Thank you for contacting us. Your email and contact information has been added to our mailing list. The (August 2011) revised proposed action was sent to your email. A follow-up email was sent on August 31, 2011 inquiring if you were receiving information and documents as requested. No response was received.

Letter 4-20110628 – Laurie Pedersen (Cara Letter #14)

Comment 4: A very interesting effort.

Response: Thank you for your interest in the four-forest initiative (4FRI). Your contact information has been added to our mailing list.

Letter 5-20110713 – Amy Waltz (Cara Letter #15)

Comment 5: No comment was provided, contact information was included.

Response: Thank you for providing your contact information. Your email and contact information has been added to our mailing list. Unless we hear otherwise, correspondence will be sent to both your personal and work contact address.

Letter 6-20110713 – Suzy Burnside (Cara Letter #13)

Comment 6: No comment was provided, contact information was included.

Response: Thank you for providing your contact information. Your email and contact information has been added to our mailing list.

Letter 7-20110720 – Billie Hughes (Cara Letter #25)

Comment 7: I am a Broadband Leader (Great Old Broads for Wilderness) in Nutrioso, Arizona and would like to represent my Broadband in the 4FRI project. I have had this involvement approved by the national leadership of Great Old Broads for Wilderness. Please advise on how to proceed.

Response: Thank you for your interest in the 4FRI. Your email and contact information has been added to our mailing list and your information was forwarded to the 4FRI stakeholders.

Letter 8-20110726 – Dave Mauer (Cara Letter #26)

Comment 8: When will the first multiproduct sales be bid for the 4FRI project? Will the projected 25% reduction in the FS budget stop the 4FRI contract from happening? Where will the trained sale prep workforce come from and who will pay for the training? Can the salvage timber in the Wallow fire area be used for 4FRI multiproduct sales (MPTS)? Where are the markets located for the products generated by the 4FRI MPTS? Will the new planning rule proposed by the Obama administration help or hinder 4FRI implementation?

Response: Thank you for your comment. Although not directly related to the NEPA analysis, we are happy to answer your contract-related questions. The first contract was awarded in May 2012. The employees needed to implement the project are being identified and planned for as part of a 10-year operating plan. Funds will come from appropriated dollars. The salvage acres from the Wallow project are being analyzed in a separate NEPA analysis (unrelated to 4FRI) at this time. Whether they could be made part of a 4FRI contract is a decision to be made by the forest supervisor of the Apache-Sitgreaves NF, in consultation with the forest supervisors from the three other forests involved in the 4FRI effort. The foreseen markets include, but are not limited to, areas within the southwestern United States. The new planning rule has no bearing on the Coconino and Kaibab NFs analysis as these forests, in addition to the Apache-Sitgreaves NF, are proceeding with plan revision using the transition language in the rule and completing plan revision using the 1982 rule.

Letter 9-20110817 – Stephen Campbell (Cara Letter #23)

Comment 9: I will be out of the office until August 18, 2011. I have neither phone nor other electronic communications available until after my return.

Response: No response needed to auto-reply message.

Letter 10-20110817 – Chad Hanson (Cara Letter #24)

Comment 10: Hi, I'm out of the office, and out of contact, until Monday August 22, 2011.

Response: No response needed to auto-reply message.

Letter 11-20110817 – Susan Starcevich (Cara Letter #16)

Comment 11: I will be on leave from 9:00 AM Wed, 8/10, until Mon, 8/22. I'll reply to your inquiry upon my return to the office. I will not be checking email during my absence, so if your request cannot wait until my return, please contact Steve Webber at AWEBBER@wapa.gov or 7209627272.

Response: No response needed to this auto-reply message.

Letter 12-20110817 – Liz Boussard (Cara Letter #2)

Comment 12: I can no longer participate in this effort so please remove me from your list.

Response: Thank you. Your name, e-mail, and physical address have been removed from the 4FRI mailing list.

Letter 13-20110820 – USA Citizen 1 (Cara Letter #4)

Comment 13-1 (Cara Comment 4-1): There is no need for this project.

Response: Thank you for commenting on this project. The need for this proposal was determined by comparing the objectives and desired conditions in the Coconino and Kaibab NFs Land Resource and Management Plans (forest plans) to the existing conditions related to forest resiliency and forest function. In summary, we found there was a need for: (1) moving vegetation structure and diversity towards desired conditions by creating a mosaic of interspaces and tree groups of varying sizes and shapes, (2) moving towards a forest structure with all age and size classes represented as identified in the 1996 forest plan amendment for northern goshawk and Mexican spotted owl habitat, (3) managing for old age (pre-settlement) trees such that old forest structure is sustained over time across the landscape by moving towards forest plan old growth standards of 20 percent at a forest EMA scale, (4) improving forest health by reducing the potential for stand density-related mortality and by reducing the level of dwarf mistletoe infection, (5) moving towards desired conditions for vegetation diversity and composition by maintaining and promoting Gambel oak, aspen, grasslands, and pine-sage, (6) moving towards the desired condition of having a resilient forest by reducing the potential for undesirable fire behavior and its effects, (7) moving towards the desired condition of maintaining the mosaic of tree groups and interspaces with frequent, low-severity fire by having a forest structure that does not support wide-spread crown fire, (8) moving towards desired conditions in riparian ecosystems by having springs and seeps function at, or near, potential, (9) moving towards desired conditions for degraded ephemeral channels by restoring channel function, and, (10) moving towards restoring select closed and unauthorized roads to their natural condition by restoring soil function and understory species. The environmental consequences will display the differences between the

no action and the action alternatives and disclose how each alternative would move the project area towards desired conditions.

Comment 13-2 (Cara Comment 4-2): Extend time to comment please.

Response: As part of your comment on the 4FRI project, you requested a comment extension. On September 25, 2011 we responded via email (the only contact information we have). The email stated, “As part of your comment on the Four-Forest Restoration Initiative project, you requested a comment extension. The comment period for the proposed action for this phase of the project will not be granted as we have been actively seeking public comment since January 25, 2011. Here is a summary of our public involvement: On January 25, 2011, the draft proposed action was sent to a mailing list (hard copy and electronic mail) of 1,331 individuals, local and State of Arizona government, federal and State of Arizona agencies, and organizations. A Notice of Intent (NOI) to prepare an environmental impact statement and a request for comment for a 45-day period was published in the Federal Register on January 25, 2011 (FR Doc. 2011–1444). Fifty-four (54) responses were received through May 5, 2011. Responses include letters, electronic mail, and comments received at public meetings. Notices regarding the meetings were initially posted on the Four-Forest Restoration Initiative portion of the Coconino and Kaibab NFs’ website in January of 2011. Currently, information is posted on the 4FRI website at:

<http://www.fs.usda.gov/4fri>. Meeting notices were published in the Verde Independent on January 15, 2011 and the Arizona Daily Sun (newspaper of record) on January 19, 2011 and February 4, 2011. A news release addressing the scoping comment period and public meetings was posted in the Arizona Independent (Williams, Arizona) on February 1, 2011. A news release announcing the April 27, 2011 public meeting was posted to the forests’ website on April 21, 2011 and distributed to local media. On June 2, 2011, a news release announcing a June 7, 2011 public meeting to be held at the Coconino National Forest was posted on the forests’ website and released to local media. The June 7, 2011 meeting was the seventh public meeting held to review progress on the draft proposed action. Although scoping began in January of 2011, information on the 4FRI objectives was published in Arizona newspapers, including the Arizona Republic, as early as November 21, 2010. Several public meetings and workshops were held from January 20, 2011 to April 24, 2011 for the purposes of refining the draft version of the proposed action. The proposed action reflects most comments and treatment recommendations received during those meetings. All interested parties (including you) were able to provide comments within the timeframe provided for the refined proposed action. However, there will be a 45-day comment period when the Draft Environmental Impact Statement (DEIS) is released in the summer of 2012. You are on our mailing list and will receive any updates we send out on these topics.”

Comment 13-3 (Cara Comment 4-3): I DS time to 0 not believe the FS really has any clear idea of what the forests were like 100 years ago, nor 500 years ago – nor 10,000 years ago, nor fifty million years ago, but there is one thing the same – the forests have changed – the climate has changed – we cannot continue a static situation in nature. Nature is all about change. This is clearly a boondoggle to get money when we need to let nature change.

Response: Thank you for your comment. The no action alternative best addresses your topic. The historic condition of the ponderosa pine forest in the project area, including the role of fire is derived from the best available science. A century ago the pine forests were dominated by widely-spaced large trees with a more open, herbaceous forest floor (Cooper 1960). Typical historic tree group/patch size ranged from 0.1 to 0.75 acres in size, (2 to greater than 40 trees) (White 1985).

This historic range of variability¹ condition for trees per acre on the Fort Valley Experimental Forest, near Flagstaff, Arizona, is estimated to average 23 to 56 trees per acre (Covington 1993). Fires burned on a frequency ranging from 2 to 21 years (Weaver 1951; Cooper 1960; Fule 2003; Heinlein et al. 2005; Diggins 2010; Swetnam and Baisan 1996; Fule et al. 1997), with the majority of acres burning with low-to-moderate severity surface fire. The herbaceous understory fueled frequent fires started by lightning, and thinned and/or eliminated thickets of small trees keeping the forest open and park-like (Allen et al. 2002). This created a mosaic of grass, forbs, shrubs, and trees. Under these conditions, the forest maintained its diversity and resiliency to fire and other natural disturbances. Today, human factors have led to a lack of re-occurring fire, which has resulted in a landscape that is highly departed from historic reference conditions.

Comment 13-4 (Cara Comment 4-4): We can of course get the [offensive word omitted] cattle out of ere, who are chewing up the place. FS lets cattle ranchers have cheap cheap cheap almost nothingness cost to use public land, which has ruined it. FS keeps on doing it and letting the land get chewed up so no wildlife can live there anymore and wildlife has beneficial effects on foerst, which are lost when cattle come in.

Response: We assumed that the recommendation proposed is to remove livestock grazing from the project area. The price to graze public lands is outside the scope of this project. Likewise, authorizing or removing livestock grazing is not a reasonable recommendation; therefore, it is outside the scope of this project.

Comment 13-5 (Cara Comment 4-5): FS is also negatively affecting this land by the huge timber sales that they have allowed. Instead of conserving and protecting this forest, the fire sale has gone on by the officials at fs management. Money and greed make the world go round and the FS instead of conserving and protecting which is what their chapter is all about. So the FS has negatively caused this. Now after this negative mgt on the part of the FS, the FS says we need more and more and more money – isnt that typical govt procedure/don't we see that in every single govt agency in [offensive word omitted] corrupt washington DC. Its time to shut down this grandiose plan which will involve more money for salaries, and pensions and entail and medical and all the benefits that nobody in private industry gets any more. Besides private limos for FS execs, etc. There is no need for this site. The FS has managed this area so poorly and so badly and with so much greed that that has a lot to do with the common of the forest. Lets insist on the FS changing its policy and working to its chargter and stop looking to tax and spend and tax and spend.

Response: If the crux of the statement is to affect policy change, it is outside the scope of this project and no further response is warranted.

¹ For every biophysical environment, natural disturbance processes such as fire, insects, disease, wind, etc. have measurable patterns of frequency, intensity, and spatial scale. The pattern of variability over time constitutes the historical range of variation (HRV). This variability in disturbance regimes, over time defines the range of forest species composition, structure, and functions. The ability of an ecosystem to absorb and recover from disturbances without drastic alteration of their inherent function is central to the concept of HRV. In the southwestern US, fire is a primary disturbance agent and fire regimes are central to understanding HRV as it relates to various forest types (Fulé et al. 2003).

Letter 14-20110822 – Marcus Selig (Cara Letter #17):

Comment 14: I have a question about the proposed Forest Plan amendments addressed in the PA. For “No. 2: Post-savanna treatment canopy cover and reserve trees in goshawk foraging habitat” will the amendment language also specifically limiting the amendment to 27,177 acres of savanna treatments or will it be as general as the Proposed Language indicates?

Response: On August 22, 2011 we responded via e-mail that the proposed amendments for deviation from canopy cover and reserve tree forest plan requirements are specific to a defined number of acres on each forest: 27, 177 acres for the Coconino NF (proposed action, p. 87) and 17,997 acres for the Kaibab NF (proposed action, p. 90). This response remains accurate with the exception of refining the acres that would be subject to the amendment. The acres on the Coconino NF have increased by 278 for a total of 27,455 acres, and the acres Kaibab NF have increased by 28 for a total of 18,025 acres.

Letter 15-20110823 – Kim Caringer (Cara Letter #18)

Comment 15: Thanks for the email. I will be out of the office for 3 weeks (August 22nd-September 9th). If you need assistance with a project, please contact Gail Brooks at (520) 901-8532 or brooks@ecr.gov. Otherwise, I will respond to your email when I return.

Response: No response needed to this auto-reply message.

Letter 16-20110823 – Cyndy Cole (Cara Letter #19)

Comment 16: Hey there: Thanks for the e-mail. A quick question: About what could be the timing on the CNF offering a contract for 4FRI-related work? (example – coming month? Coming year?)

Response: Thank you for your interest in 4FRI. On August 23, 2011, 4FRI Assistant Team Leader Dick Fleishmann responded via e-mail, “Cyndy-The RFP for the 300,000 acre contract was extended to September 6 at the request of an interested bidder. An FS team will evaluate the submissions to the RFP based upon the evaluation criteria outlined in Appendix M of the RFP. The timeframe for this will depend on the number of submissions are entered and the completeness of the submissions. A contract could then be awarded if the cost is not excessive to either one contractor for the entire area or to up to three individual contractors (one for each individual working circle outlined in the RFP)---the timeframe of this will be in late September or in October. There could be a task order out of the contract to harvest locally soon after the contract on the shelf stock sales that are identified in the RFP for 2012 (outlined on page 12 of the RFP). Bob's, Elk Park, and Clark are on the Flagstaff Ranger District and Pomeroy of the Coconino and KA are on the Williams Ranger District of the Kaibab. The maps for these projects are located in Appendix E of the RFP. Give me a shout if you need more information.”

Letter 17-20110823 –Flagstaff City Council (Cara Letter #20)

Comment 17: Thank you for contacting the Flagstaff City Council. We value citizen input and review all of the correspondence that is sent to us. However, depending on the nature of your email, you may or may not receive an additional response. If your issue pertains to an item on the City Council agenda, it will be included as part of the record which we will use to make our decision. If your concern requests additional follow-up or information, we will respond more

fully in the future. Whether or not your email requires a response, please know that your input is very important and we appreciate your taking the time to let us know your thoughts.

Response: No response needed to this auto-reply message.

Letter 18-20110823 – Mark Herrington, Graham County Board of Supervisors (Cara Letter #3)

Comment 18: I'm submitting these comments as the Chairman of the Graham County Board of Supervisors. I was appointed to the Governor's Forest Oversight Committee and later appointed as a member of the Governor's Forest Health Council October 2, 2007. I have worked for many years in support of the basic principles of the 4FRI. We as the Graham County Board of Supervisors have completely supported an effort to bring back the economies of the counties affected by the importance of forest restoration. We speak in support of the EIS that proposes the restoration activities on approximately 600,000 acres of the Coconino and Kaibab National Forests. We believe that the involvement of large and small industry is essential to the success of forest restoration. This 600,000 acres is a good beginning and the need to press forward with long term contracts of equivalent scale should be enthusiastically pursued.

Response: Thank you for your support.

Letter 19-20110823 – Sandra Cosentino (Cara Letter #1)

Comment 19-1 (Cara Comment 1-1) I am writing you as a concerned 21-year resident of the Verde Valley. I understand the science and the positive outcome for the health of the national forests here in northern Arizona as put forth in the July, 2011 draft Proposed Action for Four-Forest Restoration Initiative Coconino and Kaibab National Forest, Coconino County: In response to the purpose and need, the Coconino and Kaibab National Forests propose to conduct approximately 595,370 acres restoration activities (within the 988, 764 acre project area) over approximately 10 years or until objectives are met. Restoration activities would occur over a ten-year period or until objectives are met. Approximately 20,000 to 30,000 acres would be thinned annually and up to 60,000 acres prescribed burned annually across the two forests.

Response: General Information, no response required.

Comment 19-2 (Cara Comment 1-2): While I support your goals, I am concerned that this plan will increase an already very negative impact we have been experiencing here in the Verde Valley due to the almost constant smoke in the air, with the early morning ponding being the most unhealthful.

Response: See response to comment 1.

Comment 19-3 (Cara Comment 1-3 and 1-4): As you well know, in both Grand Canyon and Verde Valley (two most visited tourist destinations in Arizona), the smoke drifts down into these huge basins. We have hardly had a clear sky day all spring and summer. You burn in the most lovely outdoor weather times of the year in spring and fall when we would like to be outside. This is also our high tourism times of year. Myself and other seniors I exercise with all have had many, many days where the smoke made us feel tired, unable to sleep well, just not up to par. Some days you could smell the smoke and barely see the cliffs. We stay inside with the windows closed on days when you want the windows open and would love be outside enjoying the season. This is

unhealthy and depressing psychologically. Dawn is my favorite time to be out in nature and so many of them have been thick with smoke in the last 2 years. Often the stars are hazy too, no longer having the good night sky star viewing. I carry nose and eye wash with me now when I am going to be outside for long to help prevent congestion and irritation. The smoky air is also negatively affecting our main economy: tourism

Response: See response to comment 1.

Comment 19-4 (Cara Comment 1-5): I have been calling ADEQ and the Forest Service offices about the excessive smoke here in the Verde Valley for 2 seasons now. Now I fear it will only worsen with this new plan.

Response: See response to comment 1.

Comment 19-5 (Cara Comment 1-4): I appreciate the new understanding of fire ecology that has emerged in recent decades. But do we down here in low lying Verde Valley (and our 4 million annual visitors) have to suffer with the new zealous rebalancing approach for the next decade as penance for the over suppression of fires in past century??

Response: See response to comment 1.

Letter 20-20110824 – Unknown (Cara Letter #5)

Comment 20-1 (Cara 5-1): why are you asking for comments by august 26 when you did not publish this until august 12 - is there some reason for this hurry up secret thing when most americans are finishing up summer vacation that you want to sneak through? why no 30 days to examine this? could this be a make work plan solely? you must extend time to comment.

Response: The comment period was not extended. See our response to your first email coded as letter 13. The first comment period went from January 2011 to May 2011. Instead of accepting comments for 45-days, we accepted comments for 5 months. The August 2011 comment period was a second, informal comment period. The revised proposed action was released after meeting monthly with interested parties to work on refining the proposed action from January to June, 2011 (when we held our last progress meeting). No other party indicated a need for a longer comment period given all the work that had been undertaken. We are now providing monthly NEPA updates (via public meetings with conference calling available) until the DEIS is published and the 45-day formal comment period begins.

Comment 20-2 (Cara 5-2): taxpayers cannot pay to restore the forests to the year 1500 because climate change has changed what is going on in the climate here. the temperatures are different, the seasons are different. the wildlife is moving north, etc. the trees are moving north. the new book 1493 delineates all the changes that took place in america when columbus came here and all the other explorers who brought all kinds of plants, animals, and diseases with them. there is no way to stop those changes. you need to understand that massive change took place in 1493 and beyond. this attempt to go back to before columbus is absolutely fruitless. you need to investigate more than this plan shows you have done. jeanpublic address if required

Response: Please see our response to your previous letter (comment 13) regarding the need for change and the science behind the proposal.

Letter 21-20110824 – Diane Arnst, Arizona Department of Environmental Quality (Cara Letter #21)

Comment 21: The ADEQ Air Quality Division has reviewed your letter, dated August 15, 2011, regarding your Request for Comment on the Coconino and Kaibab National Forests Four-Forest Initiative Refined Proposed Action. We responded to your initial request for comment in our February 2, 2011 letter to Mr. Earl Stewart. No further comment is needed on the Refined Proposed Action.

Response: Thank you. Your comments from your February 2, 2011 letter have been considered. All prescribed fire actions will be designed to meet ADEQ requirements.

Letter 22-20110826 – Dennis Rayner (Cara Letter #22)

Comment 22-1: To follow up on our discussions Tuesday night at Sedona City Hall, I am not suggesting that the Forest Service or ADEQ is deliberately trying to compromise human or environmental health. However it is very clear that wood burning with incomplete combustion, based on EPA studies, e.g. EPA453/R93036 and papers in Science, Vol. 266 (1994) and Anal. Chem., 54, 2292 (1982), posit that wood burning releases particulate carbon, volatile organic and inorganic compounds that are toxic, e.g. carbon monoxide, nitrogen oxides, and sulfur oxides and/or potent carcinogenic compounds, e.g. dioxins and polycyclic aromatic hydrocarbons, and toxic metals like lead and radioactive cesium. Also produced are considerable amounts of oxygenated aromatics like various phenols that are uncouplers of oxidative phosphorylation resulting in decreased ATP production in most life forms, which can result in death. Clearly a fetus, the young, and, the elderly are the most vulnerable as are those with chronic respiratory problems.

Response: Thank you for your comment. The Forest Service is required to comply with air quality standards set by the EPA, as enforced by the ADEQ. Prescribed burns are conducted in accordance with federal regulations after several levels of review and approval, and must be approved by ADEQ prior to implementation. In all action alternatives, it is likely there would be increases of smoke over current levels, though we would not exceed the levels allowed by the ADEQ. The major pollutant of concern in smoke from wildland fire, including prescribed burns and wildfires, is fine particulate matter (Ottmar 2001). Particles larger than 10 microns in size tend to settle out of the air; smaller particles remain airborne, and can cause respiratory problems. Studies indicate that 90 percent of smoke particles emitted during wildland fires are PM 10, and about 90 percent of PM 10 is PM 2.5 (Ward and Hardy 1991). Human health studies on the effects of particulate matter indicate that it is PM 2.5 that is largely responsible for health effects (Dockery and others 1993). Because of its small size PM 2.5 has an especially long residence time in the atmosphere and penetrates deeply into the lungs (Ottmar 2001). The Clean Air Act defines the NAAQS for PM 2.5 as an annual mean of $15\mu\text{g}/\text{m}^3$, and a 24 hour average of $35\mu\text{g}/\text{m}^3$. At this concentration or above, PM 2.5 is considered to have a detrimental effect on public health. It is important to note that it is not the total amount of emissions from a fire that have effects on human health, but rather how concentrated pollutants in ambient air are for a period of time. Atmospheric conditions during a fire have a considerable influence on how particulate matter is distributed through the ambient air, and its potential to affect public health. Wind speed, wind direction, mixing layer height, atmospheric temperature profile upward in the atmosphere, and atmospheric stability all impact where and how well smoke will disperse.

To respond to the smoke issue, design features were developed to reduce the amount of smoke produced from project activities. In addition, in response to public comments, an alternative that significantly reduces the acres to be prescribed burned was developed. In alternative D, the acres to be prescribed burned would be reduced from 587,923 (alternative B) to 178,852 acres. Acres that would be burned in this alternative would occur mostly in grassland vegetation. The fire ecology, air quality, recreation, and social-economics environmental consequences will disclose the potential impacts to air quality, quality of life, local, and regional economy, and public health and safety. The indicators used to evaluate the smoke issue are: (1) Quantitative smoke emission modeling and qualitative interpretation to evaluate the potential for smoke within communities that are within or in near proximity to the project, (2) Modeling of principal pollutants including carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter less than 10 microns in size (PM 10), particulate matter less than 2.5 microns in size (PM 2.5), ozone (O₂), and sulfur dioxide (SO₂) pollutants that pose potential health hazards to evaluate compliance with the Clean Air Act as regulated by ADEQ, and, (3) Social and economic evaluation of impacts to quality of life and tourism. An alternative that would entirely eliminate prescribed burning within the project area was considered. Please refer to our response in comment 24-4 for the summarized rationale. The complete discussion for this alternative (considered but eliminated) will be available for review prior to the publication of the DEIS.

We have reviewed the literature you referenced. The EPA study is titled “Health Effects of Subchronic Exposure to Low Levels of Wood Smoke in Rats”. The study was designed to provide information on the potential respiratory health responses to subchronic wood smoke exposures in a Native American community in New Mexico. Therefore, this study used the same type of wood under similar burning conditions and wood smoke particle concentrations to mimic the conditions observed in this community. The study noted further studies are needed to establish whether exposure to wood smoke exacerbates asthma-like symptoms that resemble those described for children living in homes using wood stoves for heating and cooking. The direct relevancy of this study to using prescribed burning on the National Forests was not found. The article, *Dioxin from Wood Burning, Dioxin Causes Facial Disfigurement* referenced a study on wood burning (Science, Vol. 266 Oct. 21, 1994, T.J. Nestruck and L.L. Lamparski, Anal. Chem. 54, 2292 (1982)). We reviewed the article from Anal. Chemistry (1982). The reference to the 1994 Nestruck and Lamparski study was specific to burning various specimens of wood in different stoves. While we do not dispute the fact that wood burning can release byproducts, we could find no direct relevancy to the 4FRI project. This Analytical Chemistry article can be accessed at this website: <http://burningissues.org/dioxin.htm>. The Science article was not readily available. Please submit if you would like us to review and comment on the document.

Comment 22-2: On the second page of the Coconino National Forest Handout, under the topic of “What about the pollution from the smoke”. You state “Smoke produced on a prescribed burn occurs only for the duration of that burn”. This is not true, since the acrid smoke and respiratory irritants last from morning to dusk and then some depending on wind direction and velocity.

Response: For clarification, the handout referenced was associated with the Coconino, Kaibab, and Prescott National Forests Smoke and Fire Open House hosted at the Sedona City Council Chambers (Sedona, AZ) on August 23, 2011. Smoke is only produced while the fire is burning, but it is likely to linger in low areas when it cools off overnight and there is not sufficient wind to disperse it. We have included excerpts from the air quality report that is under development which helps frame smoke dispersal:

Climatological limits are set by weather and fuel moisture, which profoundly affect fire behavior, fire effects, and smoke/emissions behavior and effects. As weather varies from year to year, so does the risk of high severity fires and the ability to use prescribed burns and wildfires to achieve resource objectives. Large fluctuations in the number of days of opportunity vary widely from year to year, creating large fluctuations in the number of acres treated with wildland fire. Running averages over many years must be used in order to view trends in fire use or undesirable fire effects.

Topography and weather patterns determine the extent to which airborne particulate matter accumulates within local airsheds. Diurnal temperature changes affect how pollutants in the region are dispersed. Meteorological conditions also limit how much smoke the airshed can absorb at any point in time without violating National Ambient Air Quality Standards (NAAQS), or visibility thresholds. During the warmest days and seasons of the year, air is heated at the surface, and rises, lifting smoke up to heights where transport winds carry it away and disperse it during the daily burn periods. Winds in the project area are predominantly from the south, southwest, and west (Figure 1) and, as such, during daytime hours, fire activities within the 4FRI treatment area are most likely to affect smoke sensitive receptors to the north, northeast, and east of fire locations. The best ‘windows’ for smoke dispersal are when the atmosphere is unstable, allowing smoke to rise up high and disperse. These conditions, when combined with low fuel moistures and high fuel loading, can also lead to undesirable fire behavior and effects. The best dispersal days are often too extreme for prescribed fire. Winds often become calm overnight, and topographic effects then dominate smoke movement. The earth surface cools and the cooling air then flows downhill, carrying smoke from smoldering fuels (duff, needles, dead/down wood), which will often ‘pool’ in low lying areas until the air warms again the next day. Nighttime settling of residual smoke from fires generates as many concerns and complaints of nuisance smoke as daytime smoke. “Nuisance Smoke” is defined in the State Implementation Plan (required by the ADEQ to facilitate managing air quality impacts) as “Amounts of smoke in the ambient air which interfere with a right or privilege common to members of the public, including the use or enjoyment of public or private resources” (Arizona State Implementation Plan Appendix A-10, pg. 35)

During the winter, weather conditions can trap emissions in a layer of cold surface air (inversion). Under winter conditions and inversions, particulates can be trapped close the surface in local airsheds including Flagstaff, Williams, and the Verde Valley. Visibility is also an air quality consideration. Visibility tends to be lowest in the summer due to regional haze and smoke from fires.

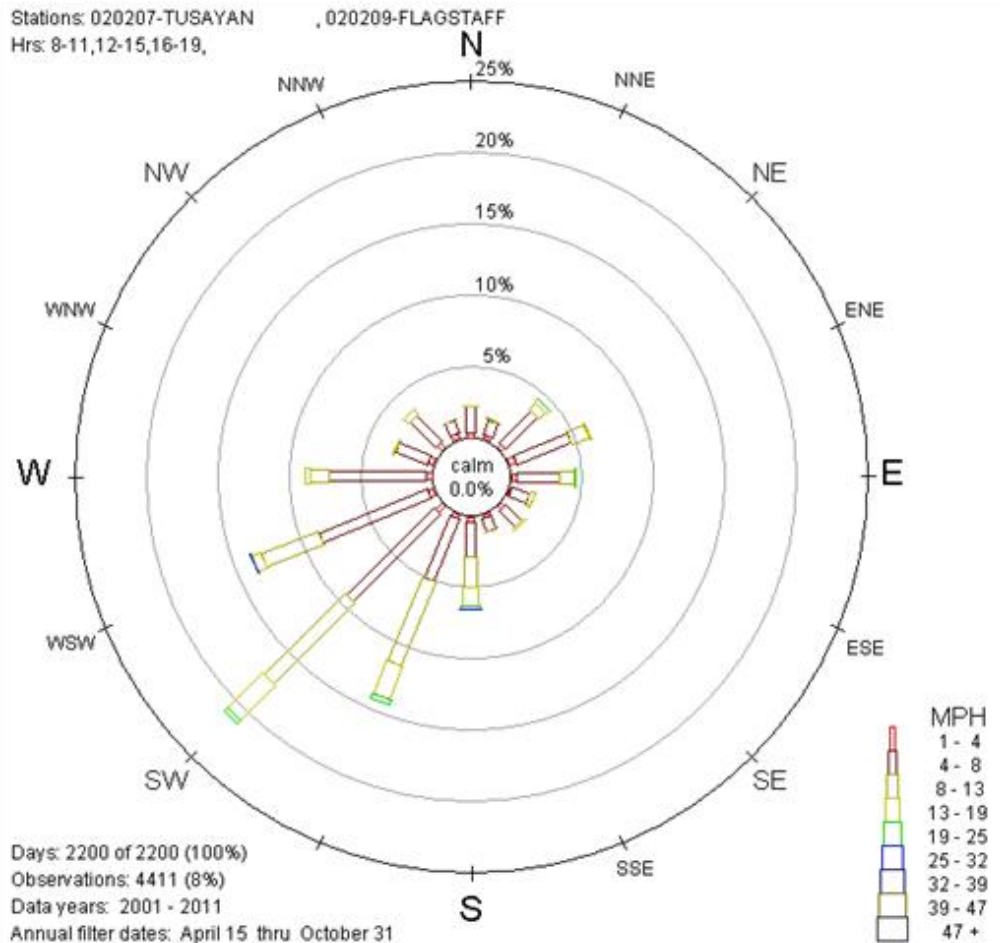


Figure 1. Weather Station Data Averages on the Tusayan District (Kaibab NF) 2001 to 2011

Comment 22-3: Does ADEQ ever monitor Sedona or our environs during a controlled burn for 24hrs or more and include the volatile organics and proper background controls?

Response: Your question has been forwarded to ADEQ, the regulating agency, for their response.

Comment 22-4: I don't believe dilution is the solution as opined by one Forest Service representative, especially with potent carcinogens and particulate carbon. To suggest that people, who are suffering, physically go somewhere else is negligent, since burns occur frequently and the smoke spreads widely and can linger in pockets and the toxic agents are not always discernable by smell.

Response: The ADEQ monitors air quality for compliance with the NAAQS and has monitors set up in the Verde Valley, Flagstaff, and multiple other sites across the state. It is not possible to monitor every acre, or even every 10 acres of land. When there are situations of specific concern, the ADEQ may set up portable monitors. "The following website: <http://www.phoenixvis.net> provides outputs of these monitors. Figure 2 (below) displays airsheds as defined by ADEQ. The 4FRI analysis will identify those airsheds that may have direct, indirect, and cumulative effects associated with project prescribed fire activities.

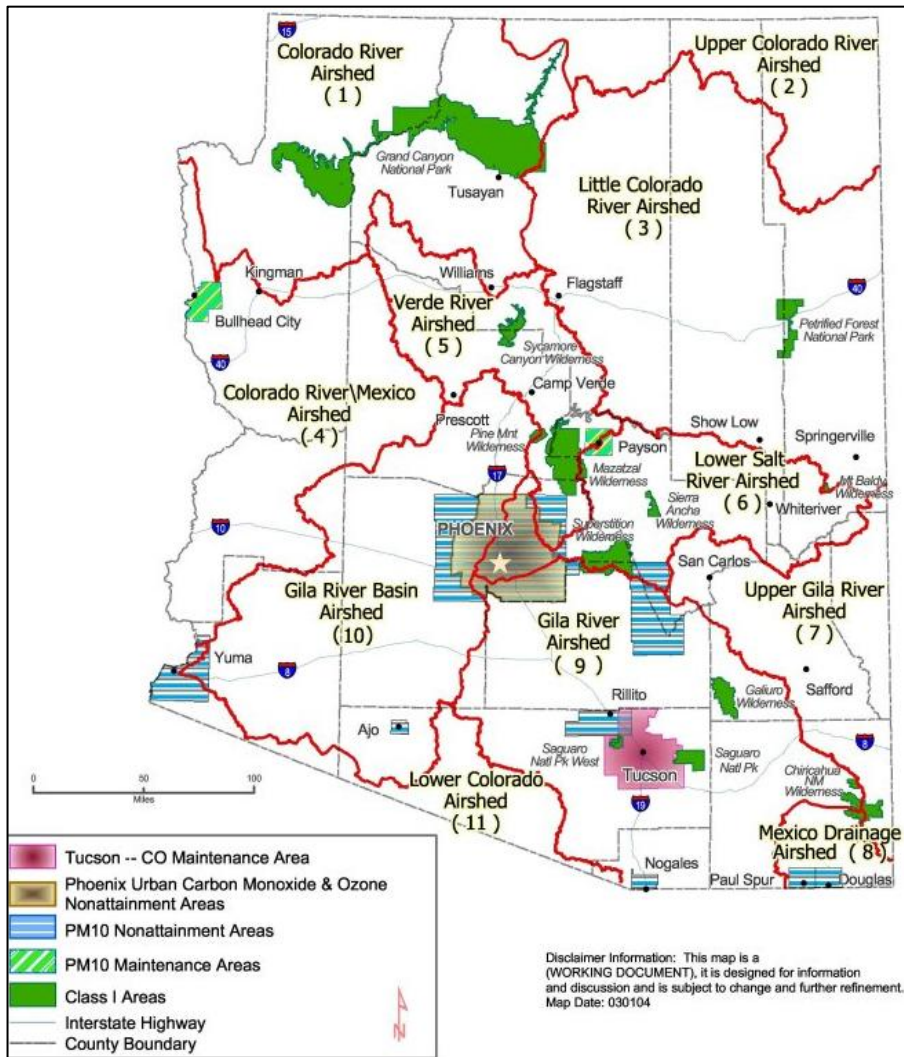


Figure 2. Maintenance and Non-attainment Areas by Airshed and Vicinity to Class 1 Airsheds

Comment 22-5: All government agencies from the Federal down to local levels need to work together to find cost-effective alternatives to continuous burning. The cost to human health is huge, probably in the multi-millions. I am willing to discuss these issues further and provide added documentation if needed, since I believe the science is available. I would appreciate your response from the senior scientists in your organizations that deal with the toxicological issues. We, including me, need to have an open mind in moving forward.

Response: Thank you for this recommendation. We look forward to having meaningful discussions based on the best available science and which consider regulatory requirements.

Letter 23-20110826 – John DeLuca (Cara Letter #41)

Comment 23-1 (Cara 41-1): In general, I support the proposed action, including its language regarding restoration of historic grasslands and savannahs.

Response: Thank you for commenting on the proposal.

Comment 23-2 (Cara 41-2): After acquiring the 4FRI shapefile with treatment descriptions, and after examining how the treatment boundaries line up with where pine trees are actually on the ground, I became concerned about how we're treating (or not treating, rather) invading pines in our grasslands. See that attached map, and zoom in on our existing grasslands within the greater 4FRI boundary, to get an idea of what I mean.

Response: Thank you for your information. We reviewed our data against what you provided.

Comment 23-3 (Cara 41-3): I recommend that the proposed action include cutting ponderosa pines and prescribed fire in all grasslands within the greater extent of the 4FRI project boundary, especially Garland and Government Prairies. This would retain the ponderosa-pine focus of 4FRI, in that invading ponderosas would be cut from historic grasslands. It is logical to include prescribed fire in these grasslands, as without prescribed fire, we will return to the current problem of ponderosa pine invasion. This also aligns with the concept of restoring and maintaining contiguous landscapes.

Response: Thank you for recommending additional grassland restoration. Alternative B and D would remove post-settlement conifers from 11, 185 acres of grassland. Alternative C directly responds to be your recommendation by increasing the acres of grassland treatment from 11,185 to 48,161 acres. In alternative C, treatment locations include the Garland and Government Prairies.

Comment 23-4 (Cara 41-4): If we keep these areas excluded from 4FRI, the proposed action will lead to arbitrary, ugly, and ecologically nonsensical contrasts on the ground. Many stands typed as TPP (ponderosa pine) that abut these grasslands will be restored to grassland or very open savanna, whereas stands typed as GRA (grassland) will be left alone and their pine invaded peripheries (which are not marginal in extent) will be denser with trees than neighboring TPP stands. On the periphery of these grasslands, there are over 100 trees-per-acre, and in the interior there are 3-10 trees per acre (according to conversations with Mark Herron and Richard Gonzalez, silviculturalists of the Williams and Tusayan Ranger Districts of the Kaibab National Forest).

Response: We agree and believe your concern is addressed in alternative C. There should be sharp contrast between the alternatives (including no action, alternative A) to evaluate movement towards the desired condition in grasslands.

Comment 23-5 (Cara 41-5): Why am I not proposing this for PJ-pine areas? In those areas, it seems difficult to differentiate a pine-PJ ecotonal ecosystem from an invaded PJ woodland. In contrast, it's quite easy to tell what is a true ecotone and what's invasion in a grassland: You just have to observe where the yellow pines and old stumps end and the black jacks begin.

Response: Thank you for your comment.

Letter 24-20110830 – Dorothy Holasek (Cara Letter #7)

Comment 24-1 (Cara 7-1): The Forest Service states that there is no budging on whether to conduct control burns because it is clearly part of a natural ecosystem in ponderosa pines, chaparral, grasslands, etc. The problem is Northern Arizona hasn't been a natural ecosystem since

the late 1950's. Ten times the amount of cesium 137 and strontium 90 as were released from Chernobyl fell upon Northern Arizona from the Nevada Above Ground Atomic testing in the late 1950's and early 1960's. As a result, the DOE, through their RESEP program is currently paying \$50,000 per cancer related cases to downwinders. These radioactive isotopes stored in our forest vegetation will be safe to breathe in the form of smoke in the year 2262.

Response: Thank you for your comment. It is an accurate statement that fire plays a role in sustaining a resilient ponderosa pine ecosystem. However, we considered an alternative that would eliminate all burning (considered but eliminated from detailed study) and fully developed an alternative (D) that substantially reduces the acres to be prescribed burned. For clarification, we recently reviewed the RESEP program to understand your reference to downwinders. Downwinders are one of the RECA Claimant Categories that provides for payment to eligible individual who were physically present in one of the affected areas downwind of the Nevada Test Site during a period of atmospheric nuclear testing, and later contracted a specified compensable disease. The claimant must have lived or worked downwind of atmospheric nuclear tests in certain counties in Utah, Nevada, and Arizona for a period of at least 2 years during the period beginning on January 21 1951 and ending on October 31, 1958, or for the period beginning on June 30, 1962 and ending on July 31, 1962. The designated affected areas are: in the State of Utah – the counties of Beaver, Garfield, Iron, Kane, Millard, Piute, San Juan, Sevier, Washington, and Wayne; in the State of Nevada – the counties of Eureka, Lander, Lincoln, Nye, White Pine, and that portion of Clark County that consists of township 13 through 16 at ranges 63 through 71; and in the State of Arizona – the counties of Apache, Coconino, Gila, Navajo, Yavapai, and that part of Arizona that is north of the Grand Canyon. This information was retrieved from http://www.justice.gov/civil/docs_forms/RECA_Categories_Summary.pdf on April 19, 2012.

Comment 24-2 (Cara 7-2): No one has ever done a study on the levels of cesium 137 and strontium 90 released from either wildfire or control burns in Northern Arizona. Arizona's statewide radiation monitoring stations were shut down years ago except for the Paloverde Generating Station because it is Federally mandated.

Response: This is a general information statement as written. However, on April 17, 2012, Henry Provencio (4FRI IDT Leader) sent an a follow-up inquiry to ADEQ asking for confirmation that EPA sets the air quality standards for public health and safety, that ADEQ is responsible for monitoring and enforcing these standards, and that the EPA does not require monitoring of radioactive isotopes for prescribed burning projects. Thank you for your comment.

Comment 24-3 (Cara 7-3): Even if we reactivated these stations, there are none in areas that receive the lions share of smoke fallout from control burns in Northern Arizona. Do we proceed with these burns under the guise that "we have no evidence of" while we are busy not looking for evidence or do we heed the warnings we already have from medical researchers?

Response: Please refer to our response to comment 22.

Comment 24-4 (Cara 7-4): I urge the Forest Service to accept a somewhat less ecologically perfect scenario for our Northern Arizona forests through widespread logging and grazing of goats and cattle in order to protect our citizens from being forced to breathe these radioactive isotopes. Many municipal, state and Federal land managers have already successfully utilized goat grazing to remove brush fuels, including our own Prescott National Forest. I would like to see a minimum of 10,000 goats in the 4FRI forests 365 days per year, preparing the way for

logging and cattle grazing, rather than 10,000 cancer deaths in the next 20 years for our Northern Arizona residents.

Response: Thank you for your comment. To respond to the issue regarding project-related smoke, design features were developed to reduce the amount of smoke produced from project activities and an alternative that reduces the acres to be treated with prescribed burning was reduced from 587,923 acres (alternative B) to 178,852 acres (alternative D) was developed. Acres that would be burned in this alternative occur mostly in grassland vegetation. The fire ecology, air quality, recreation, and social-economics environmental consequences disclose the potential impacts to air quality, quality of life, local and regional economy, and public health and safety. The indicators used to evaluate the smoke issue are: (1) Quantitative smoke emission modeling and qualitative interpretation to evaluate the potential for smoke within communities that are within or in near proximity to the project, (2) Modeling of principal pollutants including carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter less than 10 microns in size (PM 10), particulate matter less than 2.5 microns in size (PM 2.5), ozone (O₂), and sulfur dioxide (SO₂) pollutants that pose potential health hazards to evaluate compliance with the Clean Air Act as regulated by ADEQ, and, (3) Social and economic evaluation of impacts to quality of life and tourism.

An alternative that would entirely eliminate prescribed burning within the project area (Coconino and Kaibab NFs) was considered. The alternative would avoid project-related smoke impacts from prescribed fire. The alternative would eliminate smoke impacts (from this project only) during certain times of the year when smoke impacts are largely from prescribed fire (pile burning, broadcast burns, and jackpot burning), generally, mid-to-late fall, winter, and early spring. However, the likelihood and degree of potential impacts from wildfire smoke, though less frequent than from prescribed fires, would continue to increase as fuels continue to increase in the forests.

The IDT found there would be insufficient movement towards having a forest that has increased resilience to undesirable fire behavior and its effects. Thinning operations would reduce the amount of canopy fuels available for burning by moving thinned fuels offsite and by decreasing the potential for crown fire and emissions. However, even in thinned stands, when fires did burn under warm, dry, windy conditions, the potential to produce fire effects of greater extent and higher severity than are healthy for ponderosa pine would exist on over 40 percent of the project area. Decreasing the canopy fuels from thinning would increase sun and wind at ground surface. This would produce drier fuels and increases the surface cover of fine, herbaceous fuels. Drier, warmer conditions at the surface can increase fire intensity. Though the potential for crown fire may be low or non-existent as a result of thinning, surface fire intensity may increase (Omi and Martinson 2002). The wildland fuels that produce the most smoke in prescribed fire are the heavier fuels (dead/down woody debris), and decades of litter and duff build up. Only a small amount of the canopy fuels burn in prescribed fires, in contrast to high severity wildfires where a great deal of it is likely to burn. Decreasing the heavier fuels with prescribed fire would be beneficial to the ecosystem, while further stabilizing the soil, and producing less emissions than in a severe wildfire. If these fuels all burned in a wildfire under extreme conditions, even if the forest had been thinned, it likely that there would be large areas of high severity effects. Decreasing them incrementally by using a combination of prescribed fire and thinning allows these fuels to be consumed slowly, while herbaceous vegetation increases at the surface. The herbaceous cover is a light, flashy fuel that burns quickly and produces relatively little smoke, when compared with forest litter and debris.

In this alternative, accumulations of litter, duff, existing dead and down woody debris, seedlings, and small saplings would not be reduced by mechanical thinning on 40 percent of the project area. These accumulations, in addition to the debris from logging, could result in surface fires that burn at high intensities and lethally scorch tree crowns. Fires that burn or smolder for long periods of time (also referred to as fires that have long residence times) would consume or kill roots, seeds, and other organic matter in the top layers of soil. Mortality rates would be higher than what is predicted from using prescribed fires across the project area.

Regarding your concern with emissions: emissions from surface fuels burning in a wildfire within stands that have been thinned but not burned are not statistically different from those from stands in their existing condition (Figure 3). Specific to this analysis, figure 3 displays the anticipated differences in wildfire-related emissions predicted from surface fuels under different treatment scenarios and identical fire conditions. The graph displays the pounds-per-acre of wildfire emissions expected from scenarios including (1) existing condition (no action - no mechanical or prescribed fire treatment), (2) treatments limited to two prescribed fires (burn-only) conducted within a 10-year period, (3) mechanical treatment-only (no prescribed fire), and, (4) mechanical treatment with two prescribed fires conducted within a 10-year period. Please note, Figure 3 does not display the effects of the canopy fuels which, in the initial flame front, are a significant producer of emissions. However, those emissions are generally of shorter duration since they are produced as the flaming front passes by. Little canopy fuel is burned in prescribed fire. Much of the lingering smoke comes from duff, coarse woody debris, stumps, and other fuels that may smolder.

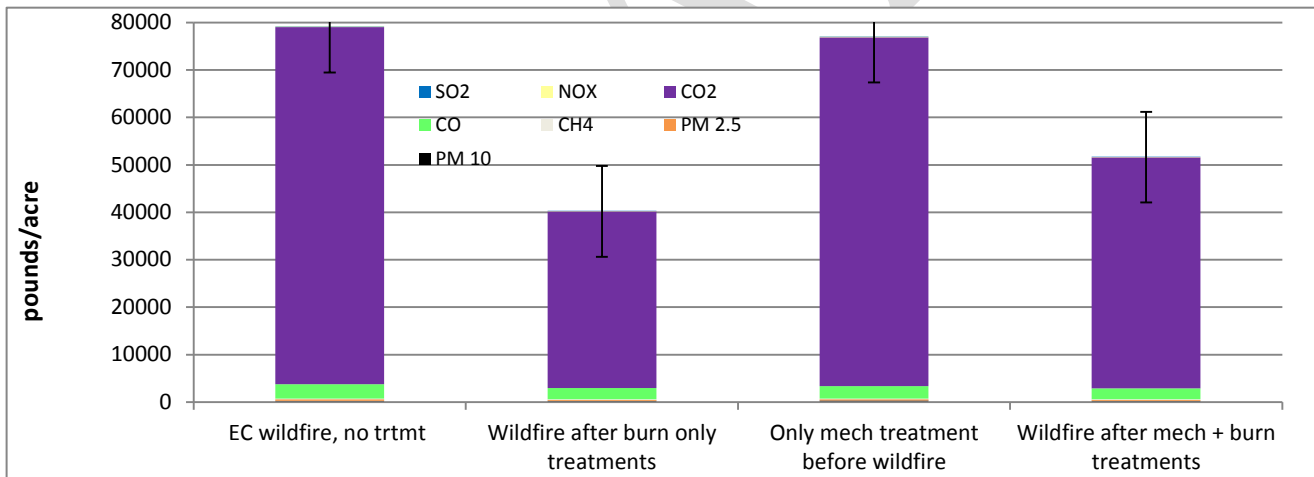


Figure 3. Projected Emissions from Wildfire With and Without Mechanical Treatment

Movement towards the desired condition of improving vegetation diversity and composition in grasslands, pine-sage, and ponderosa pine savanna (ponderosa pine with an open reference condition) could be achieved. However, over time, species composition in other areas (non-grasslands, pine sage and ponderosa pine savanna) would shift to species that are less fire tolerant (Laughlin et al. 2011). Species such as legumes, which often require smoke or fire to germinate or thrive (Abella et al. 2007; Huffman and Moore 2008), would decline. In the long term, the survival of these species would depend on having a wildfire burn in the area at the appropriate intensity. Natural fire patterns, including the groupy/clumpy arrangements that are natural to the ponderosa pine ecosystems in the project area, would deteriorate. Patterns of surface vegetation would continue to deteriorate, as shrubs and other species adapted to fire declined (Huffman and

Moore 2008; Moir 1988). As nutrients became increasingly locked up in litter layers, soil productivity would decline, affecting species composition and patterns (Moir 1988; Laughlin et al. 2011; Abella et al. 2007).

Approximately 88 percent of Mexican spotted owl (MSO) habitat and a like percentage of goshawk habitats would not move towards forest plan desired habitat conditions including improved forest structure, species composition, and reduced fire risk. Habitat for the northern goshawk and MSO evolved with fire. Fire, along with bunch grass competition, keeps pine from out-competing Gambel oak (Abella 2008; Reynolds et al. 1992), an important forage plant for many wildlife species. Fire is a recommended management tool for improving goshawk habitat, and fire suppression is credited with degrading goshawk habitat by changing forest structure and composition (Reynolds et al. 1992). No burning would require more frequent mechanical thinning, which could negatively affect soil and habitat (Covington et al. 2001). Species encroachment into grasslands and savanna would need to be managed by cutting or mowing.

In addition to solely relying on mechanical treatment, the interdisciplinary team considered your recommendation to utilize other methods than prescribed fire that include reliance on mechanical treatment and livestock grazing. Livestock, in this case, refers to cattle, horses, sheep, and goats. Within the 4FRI project area, 790,985 acres are within grazing allotments. There are 47 active livestock (cattle and sheep) allotment management plans in place that permit over 20,000 animals (see range specialist report) to utilize the forests. Grazing allotments are currently authorized on 100 percent of the proposed treatment area. Allotment plans address suitable forage areas and are designed to maintain or improve forest resources. These plans have conservative grazing utilization standards that range between 30 to 40 percent. Grazing systems include both rest and deferred rotation and the use of these grazing systems can temporarily reduce herbaceous fine fuels where grazing occurs. However, this use is not even throughout a pasture and the herbaceous vegetation and shrubby fuels re-grow, normally within the same year.

To use livestock as a tool to reduce the threat of wildfire in this area, utilization rates would need to be greatly increased along with the length of graze periods within each pasture (the proposal was to use 10,000 livestock (specifically goats) year-round). This type of use would not contribute to the long-term health of the area. It would lead to a decline in herbaceous species production and diversity, and possibly an increase in soil compaction and, as herbaceous vegetation declined, erosion. This type of increased use would exceed what is currently permitted in the existing allotment management plans and would not be permissible in our forest plans. We acknowledge that the use of goats, etc. can be useful for projects that are limited in size and scope. We have used sheep on the Coconino NF to control leafy spurge and do know that the Prescott NF and Nature Conservancy have used goats to control vegetation and brush in the urban interface.

In summary, it is possible to use mechanical treatments (including chipping, shredding, mastication, raking, leaf blowing) to remove most biomass offsite that would otherwise be burned and produce smoke. As noted above, grazing can temporarily reduce herbaceous fine fuels where grazing occurs. However, this use is not even throughout a pasture and the herbaceous vegetation and shrubby fuels re-grow, normally within the same year. Without fire, the effects of using only mechanical treatments would eliminate many of the ecological roles that fire provides that are necessary and beneficial to healthy forests and watersheds in the 4FRI project area. For example, within 72,720 acres of grassland, fire would not function as a natural disturbance and promote increased vegetation composition and diversity. Mechanical treatment could not replace the role

fire has in historic grasslands. In 16,000 acres of big sage and ponderosa pine on the Tusayan District, a shifting mosaic of shrubs species, sage, and ponderosa pine with an intermix of age classes (that provides for vegetation diversity) would not occur as fire is the process that maintains this diversity. Without the ability to use prescribed burning to maintain the desired canopy base heights, canopy bulk densities, and reduced ladder fuel conditions (that have been created through mechanical treatments), the risk to losing key components of the ecosystem would remain high. Approximately 41 percent of the project area would remain at risk from high-severity fire and this risk would continue to increase annually as trees grow, canopies overlap, and forest interspaces become filled with new tree seedlings and saplings.

For the reasons summarized above, the alternative was dismissed from detailed study. This is consistent with 40 CFR 1501.2(c) which states, “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 and 36 CFR 220.5(e) which states, ‘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.’” The complete discussion for this alternative will be available for review prior to the publication of the DEIS.

Comment 24-5 (Cara 7-5): For years, the Nevada Test Site Scientists always made sure that the prevailing winds would not reach Las Vegas and their children. At the very minimum, the public should be fully informed of the amount of cesium 137 and strontium 90 that they are being exposed to. Maybe some citizens would chose to relocate before the Doctor tells them that he has no explanation for their non-smoking related lung cancer or their child’s leukemia. Has anyone asked the downwinders who have already lost loved ones whether they would like more cesium 137 and strontium 90 in their bodies?

Response: As noted in response to comment 1 we will disclose what is required to be in compliance with ADEQ requirements. To gather additional information that would better respond to your concern, we have been seeking information from several sources including the Southwestern Regional Office of the Forest Service and the Environmental Protection Agency (EPA), Regions 8 and 9.

Our regional air quality specialist reviewed a journal article from 2002 in Aerosol Medicine titled, “*Respiratory Tract Deposition Efficiencies: Evaluation of Effects from Smoke Released in the Cerro Grande Forest Fire*”. The paper focuses on respiratory impacts from smoke on different subsets of the population: male, female, children, elderly, and fire fighters. The study also looked at radionuclide exposures. The main radionuclide exposure conclusions were:

1. EPA did conduct aerial radiological testing during Las Conchas last summer, though they did not detect any releases beyond background levels. The data is posted at: <http://www.nmenv.state.nm.us/nmrcb/EPAAirSampleMonitoringDataDuringtheLasConchasFire.html>.
2. Radionuclides originating from the Los Alamos Nuclear Lab (LANL) site during the Cerro Grande Fire were restricted to naturally-occurring radionuclides. Cerro Grande-related documents can be found at: <http://www.lanl.gov/environment/air/cgf.shtml>.

3. High levels of radionuclides in storm-water runoff were detected. The radionuclides were most likely due to fallout from atmospheric nuclear-weapons testing. There were similar conclusions in other papers. Since radionuclides contaminate soils, when bare soil is exposed after a burn, the radionuclides are more mobile with greater susceptibility to runoff. The prescribed burning proposed in 4FRI is designed to be low-intensity and design features have been developed to minimize the amount of bare soil.
4. Radiation doses from inhaled airborne radionuclides to individuals inside and outside the Los Alamos area were likely very small, and health effects would be unlikely. In 2011 Las Conchas fire, the LANL and the Department of Energy (DOE) reported no significant detection levels in their radionuclide monitoring. See the following link: <http://www.nmenv.state.nm.us/aqb/WildfireSmokeResources.htm>.
5. Contaminants such as radionuclides were deposited in the soil during the 1940s through 1950s. Over the last 60 years, soil and other plant material have accumulated, burying contaminants at least 12 to 18 inches below the surface. In the Cerro Grande fire, reports indicate that the fire burned only the top 3 inches of the ground. Thus, it is unlikely that radionuclides would have been released during the burn. This logic is likely to apply to the 4FRI as well.
6. Overall, research regarding wood smoke and health impacts is fairly consistent in that while there are thousands of toxic compounds in smoke, the pollutant of greatest concern due to its concentration is PM 2.5 (January 19, 2012 personal communication Hall to Ehlers).

We also contacted subject matter specialists at the EPA in San Francisco, California (Region 9). On January 18, 2012, the EPA forwarded a copy of Ms. Holasek's December 30, 2011 letter regarding the 4FRI project and the concern with the effects of prescribed fire. The 4FRI fire ecologist contacted Environmental Toxicologist/Radioecologist, Richard Graham, PhD, from the EPA Region 8 office in Colorado. Richard Graham was asked if radioisotopes could be part of prescribed fire smoke. In a January 19, 2012 email regarding the potential for prescribed burning to release radionuclides, Dr. Richard Graham stated, "We studied fire emissions up in Rocky Flats as well as monitored air emissions down in Los Alamos (Cerro Grande Fire). Data from the Cerro Grande fire show only naturally occurring radioactive materials not from LANL (Los Alamos NL) historical/current operations rad. materials. Information was also gathered from Chernobyl (paper linked below). Though there were smoke-laden radioactive materials the overall conclusion of these papers indicates that to prevent or reduce fire danger and prevent/reduce the worse type of fires (tree crown fires) the best method is by thinning trees and undergrowth burns. The prescribed burns were underburns, a typically low-intensity fire intended to simulate naturally occurring small wildfires. They were ignited as a series of discrete strips sequentially lit across the unit topography that then burned together slowly, consuming ground fuels and small live woody fuels that have accumulated over time. The bigger concern/threat is a large fire seen in N. AZ this year may have been reduced with smaller prescribed burns of the underbrush."

On April 11, 2012, Dr. Graham responded to a second inquiry from the 4FRI fire ecologist and indicated radioisotopes could be part of prescribed fire smoke. When asked if they are associated with nuclear power plant emissions he indicated, "most of the strontium and cesium would be from atmospheric testing attributed to the United States, China, France, and Britain. As a result, we (US) have a background of these radio fission products. They are a part of the background that

we didn't have 50 to 60 years ago. They are a part of a nuclear power plant's emissions like Fukushima, but not from the Palo Verde or other nuclear power plants that are present in Arizona. They are present in wildland fires from fuels in the areas where there was fallout. In the sense that they are heavy metals, they fall out within a short distance depending upon the lofting and the fire. EPA has monitored and measured this in the past. Basically, the heavy smoke is more of a concern from inhalation".

Letter 25-20110830 – Marsha Honn Wiedle (Cara Letter #34)

Comment 25-1 (Cara 34-1): Thank you for the opportunity to have input on the forest restoration program. I hope you will openly consider comments made by the public as your decisions on how to manage the forest will effect the health and well being of thousands of innocent people.

Response: Thank you for your interest in the 4FRI.

Comment 25-2 (Cara 34-2): Control burning needs to stop, while the healthful alternatives of logging/mulching and goat and cattle grazing are actively perused.

Response: Please see our response to comment 24-4.

Comment 25-3 (Cara 34-3): The smoke generated by prescribed burns is causing multiple health problems including respiratory cancer, migraines, and other problems. Although I reside in the Snowflake area the smoke from your control burns effects me directly as the smoke often settles in our area.

Response: Thank you for your comment. Please refer to our response to comment 1 and comment 24-4.

Comment 25-4 (Cara 34-4): Forest wildfires do generate carbon emissions, but so do prescribed burns. There are so many multiple prescribed burns in the state of Arizona going on at the same time that the skies in our community are rarely clean and clear of forest fire smoke. Clean lungs, healthy people, and blue skies seem to a thing of the past here. It is sad as our area used to be known for having some of the cleanest air in the nation. Now if you call ADEQ, they will tell you this is not a good place to live because of all the prescribed burns being done by the forest service.

Response: Please refer to our response to comment 1 and comment 24-1.

Comment 25-5 (Cara 34-5): I want my friends and family to live in a clean healthy environment and I am counting on you to think of the citizens of Arizona and stop the use of these toxic and inefficient forest management practices.

Response: Please refer to our response to comment 1, comment 24-1, and comment 24-5.

Letter 26-20110829 – Gary Gumbel (Cara Letter #27)

Comment 26-1 (Cara 27-1): I have previously commented, unfortunately I've lost the correct mailing address for the final comments...before they close.

Response: Thank you for your comment. This document will be sent to you via email, which you have provided. The DEIS will include the address to use for sending post mail letters.

Comment 26-2 (Cara 27-2): One last thing, as I mentioned moving from Chicago to escape the mosquito sprayers and chem lawn treatments, I brought my oxygen tank to Snowflake, Arizona...high mesa and relatively clean (except for the renergy burner). I have been overwhelmed with smoke at times, mostly in the fall with the prescribed burns or their mismanagement thereof.

Response: In response to your concern, we made smoke a key issue for this analysis. See our response to comment 1.

Comment 26-3 (Cara 27-3): The ADEQ in Phoenix (Brad Busby) is less than helpful after the fact, when the forest has been burning for three days and has cleared out...then you may receive a phone call in return, when I've had to scramble to find the sources of burning and pack and pack up my van to sleep on various Walmart parking lots. I use my cell to call home to determine if it is safe to return. The office in Flagstaff should be abolished to save taxpayer money, they do nothing, they know nothing.

Response: We would be happy to assist by providing you the Coconino and Kaibab NFs' fire information contact list as well as key website links where prescribed fire information is located.

Comment 26-4 (Cara 27-4): You see, the problem is a lack of ANY communication among the 5 or 6 forest services. When the head honchos decide to burn the 3000 or 5000 acres, we know NOTHING until its on us, then we pack up and usually head West or Northwest on the other side of the wind. These forest service guys know exactly what they are doing, because they spare the big cities (especially south), Prescott, Sedona and the toni towns....they could help us--to forewarn us. I was totally impressed with the firefighters at the Wallow fire, they steered a 700,000 acre fire around and between three good size towns, very impressive..... made it look easy. If they can do that (I had no idea of the mechanics of fighting wildfires until last spring), then they can at least GIVE US A CALL before sending me to the hospital or worse. If you want to burn, then burn....just give us a head start.

Response: In response to your comment, we reviewed what coordination efforts are in place within the forests and with other adjacent agencies. We found that an agreement exists between the Coconino, Kaibab, Apache-Sitgreaves, and Prescott NFs that is supposed to facilitate planning prescribed burns and notifying the public. In summary, we found that this agreement was not always being used. This concern was shared with the forest supervisors who agree that better coordination efforts are needed. With the upcoming fire season upon us, you will be able to gauge whether we are making progress.

Comment 26-5 (Cara 27-5): One last impression, I don't think your office or any office has the ability to keep up with the forests we now have in Arizona. We've had two major fires, and have hardly scratched the surface. The forest do not stop growing for a second. Every tree is growing on its own as fast as it can, you are losing a battle against nature....unfortunately. For all the thinning, it is beautiful, but not enough to keep up with the billions of trees out there. Thank you. Gary Gumbel 928- 243-8676

Response: Thank you for taking the time to provide your comments.

Letter 27-20110830 – Susan MacKay (Cara Letter #28)

Comment #27-1 (Cara 28-1): As part of the public comment on the Environmental Impact Statement for the proposed 4 Forests Restoration Initiative I would like to bring to your attention the fact that, although the restoration of the health of Arizona’s forests is a worthy goal in which all of us can participate, the excessive use of prescribed fire to bring this about presents a real threat to the health of northern Arizona residents and is, in the long run, counter-productive to the long range goal of preserving our air and water quality at as high a level as possible.

Response: While we appreciate your concern with the use of prescribed fire, the statement that prescribed fire is contrary to the goal of preserving air and water quality is not supported by science.

Comment #27-2 (Cara 28-2) Granted that, as stated in the 4FRI proposal, “high-intensity wildfires and subsequent insect and disease outbreaks” from a build-up of organic residue on the forest floor and crowded growing conditions have caused damage to the forests as well as threatening communities located near them, a program such as the proposed initiative that calls for “multi-decade” use of mechanical thinning followed by prescribed fires can only lead to a worsening of the air quality of the Northern Arizona environment. Such a program will, during the burning part of the process, release large amounts of PM10 particulates, greenhouse gasses, various petrochemical accelerants used to start the fires, and possibly dioxin and other harmful chemicals accumulated in the trees themselves into the air. At a time when climate change and the need to control greenhouse gas emissions is of critical import, it does not make sense to put massive amounts of carbon and particulates into the air through widespread use of prescribed burns.

Response: Please refer to our response in comment 1, comment 22, and comment 24 which address prescribed fire, the by-products contained in smoke, and how we have addressed the smoke issue for this analysis. Regarding climate change, our analysis will disclose the impact of climate change on the resiliency and function of the forests. It will disclose how the restoration project actions affect carbon (and the effects of climate change). Based on current projections, the primary regional-level effects of climate change most likely to occur in the Southwest that would have an effect on forest vegetation include warmer temperatures, decreasing precipitation, and increased extreme weather events. These changes could result in immediate vegetation disturbance due to wind or flooding, increased wildfire risks, increased outbreaks of insects, diseases, and spread of invasive species, increased drought related mortality, and changes in plant species composition. Regarding carbon, climate scientists agree that the earth is undergoing a warming trend, and that human-caused elevations in atmospheric concentrations of carbon dioxide and other greenhouse gases are among the causes of global temperature increases. Forests serve as carbon reservoirs; however, large-scale fire events can counter this benefit by releasing significant amounts of carbon into the atmosphere. Restoration treatments (e.g., thinning, prescribed fire) as identified in the proposed action, promote low-density stand structures, characterized by larger, fire-resistant trees. This strategy should afford for greater carbon storage in southwestern fire-adapted ecosystems over time (North et al. 2009, Hurteau and North 2009). Although fire-excluded forests contain higher carbon stocks, this benefit is outweighed in the long term by the loss that would be likely from uncharacteristic stand-replacing fires if left untreated (Hurteau et al. 2011). Research has also shown that the long-term gains acquired through prescribed fire and mechanical thinning outweighs short-term losses in sequestered carbon. In the long term (e.g. 100 years) thinning and burning would create more resilient forests,

less prone to stand-replacing events, and subsequently, able to store more carbon in the form of large trees.

Comment 27-3 (Cara 28-3): As a case in point, the recently proposed Arizona Department of Environmental Quality (ADEQ) Arizona State Implementation Plan (SIP) Regional Haze, Section 308, is intended to bring Arizona into compliance with the Environmental Protection Agency Clean Air Act and restore visibility to the Class I national parks in Arizona. As stated in the proposed Regional Haze SIP “Across the country, regional haze has decreased the visual range from 140 miles to 35-90 miles in the West, and from 90 miles to 15 -25 miles in the East. Regional haze is air pollution that is transported long distances, causing reduced visibility in national parks and wilderness areas. This haze is composed of small particles that absorb and scatter light, affecting the clarity and color of what we see. The pollutants that create this haze are sulfates, nitrates, organic carbon, elemental carbon, and soil dust. Human-caused (anthropogenic) sources include industry, motor vehicles, agricultural and forestry burning, and windblown dust from roads and farming practices.” (My underlining.)

Response: Thank you for your comment. To respond to your concern, design features were developed to reduce the amount of smoke produced from project activities and an alternative that reduces the acres to be prescribed burned by 30 percent. Alternative D would conduct prescribed burns on 178, 852 acres. This is a significant decrease when compared to alternative B, which proposes to use prescribed fire on 587,923 acres. Acres that would be burned in this alternative would occur mostly in grassland vegetation. The fire ecology, air quality, recreation, and social-economics environmental consequences disclose the potential impacts to air quality, quality of life, the local and regional economy, and public health and safety. The indicators used to evaluate the smoke issue are: (1) Quantitative smoke emission modeling and qualitative interpretation to evaluate the potential for smoke within communities that are within or in near proximity to the project, (2) Modeling of principal pollutants including carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter less than 10 microns in size (PM 10), particulate matter less than 2.5 microns in size (PM 2.5), ozone (O₂), and sulfur dioxide (SO₂) pollutants that pose potential health hazards to evaluate compliance with the Clean Air Act as regulated by ADEQ, and (3) Social and economic evaluation of impacts to quality of life and tourism. Also see our response to comment 22-4 which discusses Class 1 airsheds in context to ADEQ monitoring.

Comment 27-4 (Cara 28-4): Arizona has 12 Class I areas: Chiricahua National Monument, Chiricahua Wilderness, Galiuro Wilderness, Grand Canyon National Park, Mazatzal Wilderness, Mount Baldy Wilderness, Petrified Forest National Park, Pine Mountain Wilderness, Saguaro National Monument, Sierra Ancha Wilderness, Superstition Wilderness, and Sycamore Canyon Wilderness. A number of these are in the area that will be affected by the smoke from prescribed burns implemented as part of the 4FRI. This will further reduce visibility, and, therefore, visitor enjoyment of the national parks which are one of the major attractions bringing tourists and revenue to northern Arizona. As stated in the proposed SIP “ The goal of the Regional Haze Rule is to eliminate human-caused visibility impairment in Class I areas across the country. It contains strategies to improve visibility over the next 60 years, and requires states to adopt implementation plans.”

Response: Please refer to our response in comment 1, comment 22-1 and 22-2, and comment 24-4, which address prescribed fire, the by-products contained in smoke, and how we have addressed the smoke issue for this analysis.

Comment 27-5 (Cara 28-5): Large-scale prescribed burns in the Four Forests would, in the long run, be counter-productive to this goal as well as detrimental to the health of the forests, the economy of the region, and the well being of northern Arizona residents.

Response: Please refer to our response in comment 1, comment 22-1 and 22-2, and comment 24-4, which address prescribed fire, the by-products contained in smoke, and how we have addressed the smoke issue for this analysis.

Comment 27-6 (Cara 28-6): I live in an area (Snowflake, AZ) that is negatively affected by the smoke from the many prescribed burns and managed wildfires (wildfires in remote areas that are allowed to burn, sometimes for months at a time, as a part of “resource enhancement” management practices) connected with the White Mountain Stewardship Contract (WMSC). The WMSC is the first and largest forest stewardship contract in the nation, and the forest management model on which the 4 Forests Restoration Initiative is to be based. When I first moved to this area (because of respiratory problems), the WMSC had not yet begun, the air was clean, and my respiratory difficulties abated shortly after my arrival. But in the past several years, due to increased, nearly year-round, long-duration, prescribed burns I have had a return of asthmatic symptoms and, in addition, developed Chronic Obstructive Pulmonary Disease (COPD), which I did not have when I moved here. Many of my neighbors are also now afflicted with chronic coughing, shortness of breath, wheezing, fatigue and other symptoms of respiratory distress that they didn’t experience until the WMSC prescribed burns became so massive and frequent.

Response: While we can address the potential impacts of 4FRI (including direct, indirect, and cumulative impacts), contact should be made with the Apache-Sitgreaves NF regarding their ongoing and future vegetation management projects.

Comment 27-7 (Cara 28-6): The WMSC is currently treating up to 15,000 acres of forest per year whereas the proposed 4FRI is proposing to treat up 50,000 acres per year, three times that amount. The 4FRI acreages are mostly located to the West, South and Northwest of Snowflake and other communities on the Colorado plateau. This means that, since we are located at a lower elevation than the surrounding forests, our air flow is generally from the West and Southwest, and we commonly have Northwest breezes during the winter months, much of the smoke from the 4FRI will tend to come down on our communities (particularly at night), worsening our air quality and creating an increased health hazard.

Response: Please refer to our response in comment 1, comment 22-1 and 22-2, and comment 24-4, which address prescribed fire, the by-products contained in smoke, and how we have addressed the smoke issue for this analysis.

For clarification, WMSC-related projects may not include all vegetation and prescribed fire projects that are planned to occur on the Apache-Sitgreaves NF. The website link which displays their planned projects is: <http://www.fs.usda.gov/projects/asnf/landmanagement/projects>.

Comment 27-8 (Cara 28-7): With childhood asthma already on the rise, as well as increased incidents of emphysema and other respiratory problems in the general population, it only makes sense that we should find some other method than the use of massive prescribed burns to restore the health of Arizona’s forests, unless we want to risk destroying the health of area residents in the process.

Response: Please refer to our response in comment 1, comment 22-1 and 22-2, and comment 24-4, which address prescribed fire, the by-products contained in smoke, and how we have addressed the smoke issue for this analysis.

Letter 28-20110831 – Patricia Ringle (Cara Letter #29)

Comment 28-1 (Cara 29-1): Experience from both the Mountaineer and Elk Park Projects has shown that it is difficult to obtain the desired "groupy" leave tree arrangement with less than 50% percent of a unit area in "interspaces". A low intensity UEA treatment as described, with 10-25% interspaces, will not exhibit the desired "groupy" leave tree arrangement. A moderate intensity UEA treatment may exhibit a limited "groupy" appearance, if the percent interspaces are toward the higher end of the range, i.e. 40% of the area.

Response: Thank you for your comment. One of the criteria for prescribing UEA treatment intensities is site conditions in terms of stockability and site class. The lower intensity treatments are on the higher sites and are a trade-off between stockability versus having a high percentage of interspace. Although these treatments would not have as much interspace, they would be moving the treated areas toward an uneven-age condition as directed by the forest plans.

Comment 28-2 (Cara 29-2): "Groups of trees in the mid-age and older VSS classes would have interlocking or nearly interlocking crowns. The desired canopy cover in these groups is 40 percent or greater. This language in the above statement is contradictory. The term "interlocking crowns" is not an accurate description when referring to ponderosa pine groups. Research by Skip Smith, silviculture professor at CSU, shows that, as ponderosa pine branches sway in the wind and lateral buds brush against each other, the buds are damaged. Therefore growth of lateral branches is inhibited when they come into contact with each other and an actual "interlocking" of branches does not occur. Rather, lateral branches of trees tend to grow just up to the branches of adjacent trees and stop. The shade intolerance of ponderosa pine also precludes the interlocking of lateral branches. If the desired condition is groups of older VSS classes with closed canopies, then I would suggest that the term "closed canopy" be used instead. However, a closed canopy is defined as 60% canopy cover and greater. The Coconino NF plan describes desired canopy cover for VSS 4-6 as 40% or greater. Therefore, closed canopy groups would be significantly greater than that described in the FP. Leaving VSS 4-5 groups at 60%+ canopy cover would seriously impede the health, growth, and vigor of these groups and may result in stagnation of VSS classes. Recommend using language to the effect that only "portions" of these groups will have "closed canopies" and deleting reference to "interlocking crowns".

Response: The term "interlocking crowns" was used as another way to describe the desired condition. This terminology is consistent with general technical report, "Management Recommendations for the Northern Goshawk in the Southwestern United States" (USDA 1992) and the concept that canopy cover is directly related to the distance between tree crowns.

Comment 28-3 (Cara 29-3): "Crown Spacing between groups would average 25-80 ft..." A narrow range such as 25-80 feet between groups of trees would make it difficult to create a "groupy" leave tree arrangement. During implementation of both the Mountaineer and Elk Park Projects, we attempted to use a range of 25-75 feet in some stands and found it resulted in a significantly less "groupy" leave tree arrangement. We found that, in general, a range of 50-150 feet is much more desirable to produce a "groupy" appearance, especially if leaving larger groups

up to 1 acre in size. Leaving large groups of trees requires leaving large interspaces to create a “groupy” appearance.

Response: The 25 to 80 foot range is based on the average interspace. The average interspace for the lower intensity treatments would be at the lower end of the range and the higher intensity treatments would be at the higher end. The forest plans allow for interspaces up to 200 feet in width and 4 acres in size. We anticipate there would be interspaces that would be up to 200 feet wide. We agree that the average range should be increased to 100 feet especially in the UEA 40 to 55 and WUI treatments. We have modified the treatments to reflect this.

Comment 28-4 (Cara 29-4): “Regeneration openings would average 0.3 to 0.8 acres...” Due to the shade intolerance of ponderosa pine, I feel that this average is too low. Generally, an opening needs to be at least 0.5 acres in size in order to get an adequate amount of regeneration. If desired tree group sizes are up to 1 acre, then I would recommend increasing this “average” range of opening sizes to 0.5-1.5 acres. An upper limit of 1.5 acres would compensate for shading by adjacent groups and result in some larger groups of seedings close to 1 acre in size.

Response: The average of 0.3 to 0.8 is adequate when using the rule of thumb for regeneration opening size of 1.5 times the average tree height as the forest plans allow for regeneration openings up to 200 feet in width and 4 acres in size. We agree that there will be existing conditions where we want to make the regeneration openings larger than 0.8 of an acre.

Comment 28-5 (Cara 29-5): Intermediate Thinning “Establish crown spacing between groups that would average from 25-80 feet...” I understand that these are stands with moderate to heavy DM infection. But as stated above, this narrow range would make it difficult to create a groupy leave tree arrangement. A range of 50-150 feet would result in a more groupy leave tree arrangement and would also better enable the treatment of DM infection by creating larger interspaces in DM pockets.

Response: These stands are being managed primarily to increase growth and vigor of the remaining trees. This would be accomplished by creating irregular tree spacing tending toward group/interspace structure and establishing interspace to provide increased rooting zone for the residual trees.

Comment 28-6 (Cara 29-6): MSO restricted habitat treatments “...target of 60-100 basal area...” The text states that “stands” will be thinned to 60-100 BA. Is this target BA at the group level or stand level? If it is referring to the stand level, then this target BA is too high. A stand level target BA of 60 will not result in a groupy leave tree arrangement. A stand level target BA of 80+ will result in little regeneration of shade intolerant ponderosa pine and limit development of understory species and an uneven-aged forest structure. BAs of greater than 80 will also result in reduced tree growth. If one of the goals for restricted habitat is to have 20+ trees per acre 18”+ dbh and stands currently do not have this larger size class, then stands need to be thinned to 60 BA or less to grow these larger diameter trees.

Response: Desired conditions are at the stand level. The objective in the restricted habitat is to manage toward attaining nesting/roosting characteristics (currently table III-B1 in the MSO Recovery Plan), and creating uneven aged structure. These desired conditions include oak which the stand data indicates contributes up to half the stand basal area.

Comment 28-7 (Cara 29-7): “Crown spacing between groups would range from 25-60 ft.” As stated previously, such a narrow range would seriously impede the ability to create a groupy leave tree arrangement. Additionally, understory development would be limited. Understory productivity and diversity is an important habitat component for MSO prey species. Recommend increasing range to 50-150 ft.

Response: The location and density of the oak component greater than 5-inch dbh would have an influence on the size of interspaces and groups. The intent is for the range of 25 to 60 feet to represent an average. We will make sure this is clear in the document.

Comment 28-8 (Cara 29-8): There is no mention of thinning conifers around oak to increase the health, growth, and vigor of oak.

Response: The design features for treatment within oak have been updated as follows: “Manage for large oaks by removing conifers up to 18-inch dbh that do not meet the “old tree” definition within 30 feet of oak 10-inch drc or larger and do not have an interlocking crown with oaks (to avoid damage from conifer removal)”.

Comment 28-9 (Cara 29-9): There is no mention of the creation of openings for the purpose of pine regeneration, other than a reference to “small group cuts”. If one of the goals for restricted habitat is to create a more uneven-aged forest structure, then uneven-aged management-group selection should be utilized to increase pine regeneration. Openings 0.5-2 acres in size should be placed across 10-20% of a stand.

Response: Yes, that is the intent and the same as proposed for goshawk foraging and PFA habitat.

Comment 28-10 (Cara 29-10): MSO target/threshold habitat treatments- If the large tree component currently does not exist, then you need to decrease the BA to well below 150 to grow this size class. FVS modeling in target/threshold stands in the Hart Prairie project showed that thinning to 150 BA would never result in the desired target/threshold conditions, i.e. % SDI in larger diameter trees. However, when these same stands were thinned to 80 BA, target/threshold conditions were achieved within 40-50 years.

Response: The intent of treatments in target stands is to avoid bringing any condition below those stated in the forest plan which displays the minimum percentage of restricted area which should be managed to have nest/roost characteristics if they currently exist (Coconino NF Land Management Plan, new page 65-4) (Kaibab NF Land Management Plan, Table 13, p. 25). For any conditions that are currently below the minimum percentages, the objective would be to manage the stand to attain the conditions as rapidly as possible. Design features for treatments within MSO threshold and target threshold habitat include: (1) intermediate thinning would be used to increase residual tree health and vigor and reduce fire hazard, (2) treatments within designated threshold stands are designed to maintain, where present, greater than or equal to 150 square feet of basal area, with a portion of those acres greater than or equal to 170 square feet of basal area, (3) treatments within designated target threshold stands are designed to attain 150 square feet of basal, and (4) irregular tree spacing would be used to create canopy gaps to move toward or facilitate stand conditions that may be more conducive to low intensity prescribed fire treatment.

Comment 28-11 (Cara 29-11): “Each PAC has a 100-acre no treatment area around the known nest site.” In the revised MSO recovery plan, the nest cores may be thinned and burned. “...upper diameter limit of trees (less than 16” dbh) that may be thinned. All trees above that limit would be

retained.” The revised MSO recovery plan emphasizes leaving trees 18”+ dbh. Thinning within the Clark MSO PAC has shown that a 16” diameter cap makes it extremely difficult to reach desired conditions in terms of a groupy leave tree arrangement and openings for regeneration. In the Clark PAC, the goal was to leave openings up to 1 acre in size to increase regeneration and create a more uneven-aged forest structure, which is favored by owls and their prey. However, due to the 16” cap, the maximum opening size created was limited to ½ acre. A 16-inch cap also tends to result in a more even-aged forest structure by forcing the removal of most trees less than 16” dbh just to meet target BA/fuels reduction objectives. In PACs with a great number of trees 16”+ dbh, a 16” cap will result in high residual stand densities, a less groupy leave tree arrangement, and decreased understory productivity and diversity. In order to retain higher residual canopy covers but at the same time increase regeneration and understory development, we need to be able to do the following: *Leave a groupy leave tree arrangement with interspaces of sufficient size to develop understory diversity. Groups can maintain the higher canopy covers favored by owls while interspaces can develop the understory diversity favored by owl prey species. *Create regeneration openings of sufficient size to develop a more uneven-aged forest structure. I recommend that the PA simply state that thinning treatments within PACs will follow direction in the MSO recovery plan, will be done in consultation with USFWS, and will utilize the best available science. By being too prescriptive in the PA, we will be locked into outdated treatments and unable to adapt our management in response to changes in the MSO Recovery Plan over time.

Response: Thank you for your comment. Alternatives B and D would treat select MSO PACS up to 16-inch dbh. Alternative C, which is in direct alignment with the Draft MSO Recovery Plan (USDI FWS 2011), would treat select PACs up to 18-inch dbh. Each stand within the PAC identified for treatment would be assessed for treatment needs based on existing condition following the MSO Recovery Plan (the Plan in place at the time implementation occurs) and in consultation with the USFWS.

Comment 28-12 (Cara 29-12): Aspen Treatments “Each clone would be evaluated to determine the need for fencing or creation of other barriers to reduce ungulate browsing of regenerating aspen.”

Any aspen treatments aimed at producing aspen sprouts are doomed to fail unless the sprouts are protected from elk browse damage. Fencing currently costs approximately \$20,000 per mile to build. Additionally, the Flagstaff Ranger District can barely maintain the existing 45 fences on the district. This maintenance is done almost entirely by volunteers who are at their maximum capacity. Building an additional 82 miles of fencing is both unrealistic and cost-prohibitive. Other barriers, such as jackstrawing, are currently being built in other project areas but their effectiveness at protecting aspen regeneration has yet to be determined. The most effective way of protecting aspen from browse damage is to decrease elk numbers in these areas. I urge the 4FRI IDT to work with stakeholders, particularly the Arizona Game and Fish Department, to reduce elk numbers in areas with aspen. This project provides the perfect opportunity to have such a major landscape-scale discussion and to collaborate for positive ecosystem changes.

Response: We agree that options for protecting aspen needs to be flexible (meet site-specific conditions on the ground) in order to have successful aspen maintenance, enhancement, and regeneration. Jackstrawing is one of the methods being considered. The design feature for aspen reads: “Inclusions of aspen remnants within portions of ponderosa pine stands would be regenerated by removing all post settlement conifers from within 100 feet of the aspen clone.

Some removal of aspen within the clone as well as ground disturbing activity or burning may occur to stimulate suckering. Each clone would be evaluated to determine the type of for fencing or creation of other barriers to reduce ungulate browsing of regenerating aspen.” Although we understand your concern regarding elk use, it is not within our jurisdiction to address the management of elk. The Arizona Department of Game and Fish (ADGF) has been actively addressing this issue.

Comment 28-13 (Cara 29-13): Vegetation Treatment Design Features “In all other areas conifer snags >12” dbh would be retained...” The Coconino NF plan defines snags as 18”+ dbh and 30+ ft in height. Furthermore, the plan directs leaving 200 snags per 100 acres. It does not direct leaving “all” snags. I recommend the PA use this forest plan direction for snags.

Response: For 4FRI, the goal is to promote snags as they are an important feature within the landscape. Therefore, the design features for snags for the project are: (1) Snags would be managed to meet both forests’ forest plan requirements and move towards desired conditions; (2) Snags or hazard trees within a distance of twice their height from private land boundaries or along key roads may be felled. In all other areas, conifer snags greater than 12-inch dbh would be retained except in cases of human health and safety; (3) Within the pinyon-juniper cover type, snags would be managed for 1 per acre over 75 percent of the area and coarse woody debris (CWD) would be managed for an after treatment average of 1 to 3 tons per acre. Where available, a portion of the CWD would include two logs greater than or equal to 10 inches and greater than or equal to 10-feet in length; (4) Prescribed burns are designed to maintain desired forest structure, tree densities, snag densities, and CWD levels; and (5) In MSO habitat, manage for snags greater than or equal to 18-inch dbh and down logs greater than or equal to 12-inch dbh.

Comment 28-14 (Cara 29-14): I would also like to comment on the deferral of treatments in stands with severe dwarf mistletoe infection. I understand that severe DM treatments such as shelterwood or seed tree cuts can be controversial, particularly with certain stakeholder groups. However, treatment is being excluded on thousands of acres that are in serious need of treatment in terms of forest health restoration and fire hazard reduction. A main part of any forest restoration project should be to restore forest health to within the historic range of variability. Dwarf mistletoe infection has increased significantly over the past century. Pre-settlement conditions that were more open and “groupy” would have limited the spread of dwarf mistletoe infection and confined infection to the group level. As grassy interspaces filled in with trees due to fire suppression, dwarf mistletoe infection was better able to spread beyond the group level to infect entire stands. Restoration of forest health in terms of DM infection should be a primary objective of the 4FRI project. In fact, the PA states, “The objective of the project is to re-establish forest structure, pattern, and composition, which will lead to increased forest resiliency and function. Resiliency increases the ability of the ponderosa pine forest to survive natural disturbances such as insect and disease, fire, and climate change”. Stands severely infected with DM are the least resilient and the most likely to not survive disturbance from insects and fire. These stands are at increased risk of bark beetle attack and mortality. Kenaly et al (2006) evaluated ponderosa pine mortality in relation to DM and bark beetle attack. They found that ponderosa pine successfully attacked by bark beetles had significantly higher dwarf mistletoe ratings, indicating an association between the severity of dwarf mistletoe infection and susceptibility to attack by bark beetles. If one of the main objectives of 4FRI is to improve forest health or “resiliency”, then areas with severe DM should be treated and not deferred. Research also shows that areas infected with DM are at higher fire hazard. Hoffman et al (2007) compared surface fuel loadings and predicted fire behavior among four levels of dwarf mistletoe infestation

(none, light, moderate, and severe) in ponderosa pine in northern Arizona. They found that the wind speed required to promote the spread of a surface fire into the canopy was lower in severely infested stands. Their results suggest that stands in northern Arizona that are severely infested with dwarf mistletoe should be priority areas for fuels treatments. If one of the main objectives of 4FRI is to improve resiliency in terms of fire, then areas with severe DM should be treated and not deferred. By doing shelterwood or seed tree cuts, the project area would also be moved toward the desired VSS distribution for the northern goshawk. Across the Coconino NF, VSS 1 and 2 are severely lacking. The majority of the forest is VSS 3 and 4. By doing shelterwoods or seed cuts and regenerating areas with severe DM, the amount of area in VSS 1 and 2 would be increased.

Response: Treatments within moderately to heavily infected stands follow guidance provided by the design feature for forest health protection (i.e., intermediate thin). Stands that have an extreme infection would be burned. The decision to regenerate has been deferred to the next planning cycle.

Letter 29-20110830 – Mark Herrington, Eastern Arizona Counties Organization (Cara Letter #30)

Comment 29-1: The Eastern Arizona Counties Organization ("ECO") submitted comments on the U.S. Forest Service's "Notice of intent to prepare an environmental impact statement" for proposed restoration work on the Kaibab and Coconino National Forests, i.e., the "Proposed Action" ("PA") for the first phase of the Four Forests Restoration Initiative ("4FRI"). The respective counties within ECO are Gila, Graham, Greenlee, Apache, and Navajo. ECO is now submitting these comments in response to the revised "Proposed Action for Four Forest Restoration Initiative" for the initial planning area for 4FRI which was recently issued by your office. As was initially noted, ECO has long been involved in the movement that culminated in the 4FRI. We are particularly interested in having finally come to fruition the long-talked-about "appropriately-scaled industry" capable of thinning and beginning to restore 30,000 (or more) acres of ponderosa pine forest per year for many years. The profit motive inherent in American capitalism must be channeled toward utilization of woody biomass from our overgrown national forests, in fair exchange for the thinning and restoration objectives outlined within your Revised P.A. We recognize that the days of heavy federal subsidies in exchange for thinning activities in our national forests are waning and that we are seeking a new paradigm for industry involvement.

Response: Thank you for providing additional comments.

Comment 29-2: The specific comments that ECO has on the Revised PA are as follows: A. As with the initial "Notice of Intent", the Revised Proposed Action is silent about the need for economic partners, e.g., that "appropriately-scaled industry" and the contract parameters necessary to attract such industry. Successful implementation of most of 4FRI's ambitious restoration objectives, as has been so well documented in the Revised PA, has all along been based on the assumption of a large-scale industry partner that would economically utilize the thinned forest material in exchange for restoration services. Without this, 4FRI becomes just another planning exercise with little chance for implementation at the landscape-level envisioned.

Response: In response to your original comments, we included language that will be in chapter 1 of the DEIS that reads, "The 4FRI is a result of several years of planning and collaboration

among interested parties, groups and organizations, state and local governments, and state and federal agencies. In 2007, the Arizona Forest Health Council completed the Statewide Strategy to Restore Arizona's Forests. The strategy's vision is to integrate knowledge and experience from science, community collaboration, and economics to identify the necessary steps to increase the rate and effectiveness of forest restoration across Arizona. In February 2008, based on recommendations within the statewide strategy, the Analysis of Small Diameter Wood Supply in Northern Arizona (USDA et al. 2008) report was completed. This process demonstrated a level of "social agreement" on how much, where, and under what basic parameters mechanical thinning, as one restoration tool, could be used to accelerate restoration of the 2.4 million-acre ecosystem. In 2008, the Kaibab NF launched the Kaibab Forest Health Focus, a science-based, collaborative effort to guide future landscape-level forest restoration efforts. In 2009, Title IV of the Omnibus Public Land Management Act authorized funding for the Collaborative Forest Landscape Restoration Fund (CFLR) to support landscape-scale restoration on National Forest System lands. CFLR objectives include reducing uncharacteristic wildfire and the associated management costs, supporting local and collaborative partnerships, supporting monitoring of restoration efforts, and supporting efforts that utilize forest products that benefit communities and offset treatment costs. In an effort to further advance collaborative efforts and secure the necessary assistance, the Forest Service created a task force to work with the Forest Health Council. The purpose of the task force was to identify alternative approaches to accelerating forest restoration in northern Arizona. This included the need to attract appropriately-sized industry. In an effort to move into on-the-ground implementation as quickly as possible, stakeholders representing individuals, state and federal agencies, local governments, the four National Forests in northern Arizona, and the Forest Service's Southwestern Regional Office, moved forward with the four-forest initiative. The initiative received funding via CFLR Act in 2010."

We refrained from putting the need to attract industry into the purpose and need and proposed action because there is not a NEPA decision to be made. The work that has been underway for several years facilitated enough support for the environmental analysis to become reality. As you know, the National Environmental Policy Act (NEPA) requires that the agency conduct environmental analyses to assess the nature and importance of the physical, biological, social, and economic effects of a proposed action and its reasonable alternatives. Conclusions are reached about the significance of the effects on the human environment. These conclusions about the significance of effects determine the levels of analysis and documentation.

Comment 29-3: B. In your litany of "Desired Conditions," you never once touch upon the desired state of industry (or industries) necessary for restoration to take place at the scale that is outlined. This omission is glaring! We realize that the USFS has issued a RFP pursuant to 4FRI contracts, and that the contracting has a special "we-can't-tell you-anything" aura surrounding it. But yet, here in the Revised PA you had the opportunity to discuss the need for successful contracting in general terms, that is, in terms of "desired conditions" necessary for successful implementation of your planning. The 4FRI Stakeholders' shared with you a carefully thought-out paper on economics and utilization, yet a perusal of the Revised PA indicates that it has not been internalized in 4FRI planning for the future.

Response: Please see our response to comment 29-2.

Comment 29-4: C. In the Revised PA there is no mention of the need for a large-scale, long-term contract in order to accomplish the ambitious and detailed ecological goals of 4FRI. The essential concept central to the 4FRI effort is that the status quo has not worked in restoring Arizona's

ponderosa forests to healthy conditions, as we have been so painfully reminded by the Wallow Fire. Rather than a few small contracts, there is widespread acknowledgement and agreement that there must be a large-scale, long-term contract. Surely this is a "need" and a desired condition which can be expressed without getting into contractual specifics.

Response: Please see our response to 29-2.

Comment 29-5: D. The Revised PA is more specific about mechanical thinning and the acreages expected to be thinned. This is a necessary step and a great improvement over the oblique and vague references to mechanical thinning in the first cut at a Proposed Action.

Response: Thank you for your comment.

Comment 29-6: E. Regarding the maintenance of the forests over time, given the current conditions that exist - and the future conditions which you attempt to project - there will also be a need for mechanically thinning. Already there is a demonstrated need (and call by some groups) to "re-enter" portions of the landscape that have previously been mechanically thinned. Both fire and mechanical thinning should be available long-term tools to maintain our forests in a healthy condition.

Response: The action alternatives assume a 10-year window for completing mechanical treatments and two prescribed burns. The environmental consequences project the short and long-term effects (including longevity of treatments) until the year 2040 using the assumption that maintenance burning continues well past the 10-year mechanical treatment timeframe. Instead of speculating on what the condition of the landscape will be in 20 years, the best approach is often to implement the project and utilize the tools we have, including the ability to conduct maintenance burns and the ability to conduct a review that assess if conditions have changed substantially since the decision was made. The agency generally considers analyses older than 10 years to be "stale". The ability to conduct maintenance prescribed burns would keep the project on the restoration trajectory. As mentioned above, Forest Service policy includes the ability to evaluate new information or changed circumstances relating to environmental impacts once a decision has been made. If, after an interdisciplinary review and consideration of new information, the responsible official determines that a correction, supplement, or revision to an environmental document is not necessary, project (decision) implementation can continue (FSH 1909.15-18.1).

Comment 29-7: The above comments have a commonality: the explicit recognition of the need for and usefulness of industry to work on the ambitious ecologically-based restoration goals. As anticipated in the responses from our fellow 4FRI Stakeholders, you will no doubt hear detailed comments about various aspects of your proposed restoration activities for this area or that, for this tree or that one. The restoration planning has consumed an enormous amount of time attempting to detail about a very fine-scale geography (yet with never quite the right level of detail). Yet without a viable means to implement such planning, it will all be for naught. ECO therefore has chosen to focus its comments not on ecological restoration but rather on what it will realistically take to accomplish this well-planned restoration at the landscape-scale.

Response: Thank you for working with us on this complex project.

Letter 30-20110830 – Jean Public (Cara Letter #31)

Comment 30: burning up 400,000 acres is disgusting. you are polluting the air in a major way. i do not believe the (offensive comment omitted) you are spreading about the forest growing dense because of no burning. it is because of excess carbon dioxide in the air affecting the growth of all vegetation. you know that so stop spreading inaccurate information. forests also go through cycles of beginning stages into mature canopies so that also is a matter of time not whether your employees get extra money for burning up this nationally owned by all citizens sites. the plan seems inaccurate and strange and without real science. i think you should go back to the drawing room. whenever in doubt, don't touch it. the "management" of the forest service primarily seems to be about greed and making money through cutting down the trees, which we desperately need standing. jean public address if required.

Response: Please see our responses to comment 13-1.

Letter 31-20110831 – Jose Iniguez (Cara Letter #32)

Comment 31-1 (Cara 32-1): We would first like to thank you for the opportunity to comment on the proposed action related to the first project area of the Four Forest Restoration Initiative. We would also like to clarify these comments do not reflect the perspective of the Rocky Mountain Research Station but rather the perspectives of two individual scientists within this organization. We look forward to working with 4FRI in the future.

Response: Thank you for taking the time to comment on the 4FRI project.

Comment 31-2 (Cara 32-2): Throughout the PA document there is a duality to restore historical conditions while meeting forest plan objectives which include NOGO and MSO habitat requirements. Given this duality the fundamental question becomes; how do NOGO and MSO habitat guidelines compare to historical conditions. We struggled with a similar question in the Long Valley Experimental Forest Restoration project. In Long Valley, however we had historical data from 1937, stem mapped current conditions, and a NOGO mark in place. We are in the process of analyzing these data but here are some interesting preliminary findings that could be helpful.

Response: Long Valley Experimental Forest research has been valuable and cited in this project.

Comment 31-3 (Cara 32-3): The 1937 data was an inventory of all trees greater than 10-inches DBH within a 1- square mile section. The inventory was completed using 6400-tenth acre plots. The following is based a quarter of these plots. Comparing the historical conditions to the NOGO recommendations we found the following: 1. It is critical to clearly determine what an opening is (not defined in App. E). For example, within the 1600 historical plots we've analyzed 10% contain zero trees, 28% contain one trees or less, and 43% contain two trees or less. 2. Historically VSS classes were not balanced. At least in 1937 there was a deficit of VSS 3 and 4, while VSS 5 and 6 were surplus. This, however, can vary widely depending on how one defines openings (see figure 1). The stem map was conducted at Long Valley EF in 2010 over 160-acres of un-harvested ponderosa pine forest. The stem map included all trees with yellow bark as well as all trees greater than 16-inches DBH. Within the 160-ac study area we have found that: 1. There are 300-500 single trees, depending on how groups are defined. 2. There are 150-250 groups consisting of two trees. 3. The average number of trees per groups is not a good descriptor because the distribution is not normal. Instead there is an inverse-J relationship between frequency

of groups and the number of trees per group (see figure 2). 4. Individual groups can contain more than 150 trees. 5. Groups are generally less than 0.7-ac in size but can be larger than 2 acres. The extent of the stem mapping project has also yielded important information regarding the plot size and intensity that is required in order to capture the forest spatial pattern described in the proposed action. As earlier stated, the analysis is ongoing but we would be glad to share more information in the near future. We hope that these two data sets (1937 & 2010) will give us insight into the structure of old-growth ponderosa pine stands and that management guidelines can be developed to produce similar structure in other stands (Figure 3)

Response: Thank you for this information. We look forward to discussing the ongoing analysis.

Letter 32-20110901 – Wally Covington (Cara Letter #6)

Comment 32-1 (Cara 6-25): On behalf of the staff of the Ecological Restoration Institute, I want to thank you for the opportunity to comment on the Proposed Action for the Four-Forest Restoration Initiative. We are pleased to participate in the 4FRI collaborative efforts to implement restoration treatments. All of us are excited to be part of a project that provides the opportunity to test NEPA implementation at large scales in a collaborative format. We fully realize that innovation can be challenging. However, we believe there is a need for provide additional detailed science support that aligns with your NEPA procedure using the strongest evidence available.

Response: Thank you for support. We look forward to working with you to improve the document.

Comment 32-2 (Cara 6-27): Your response to the first comments on the draft Proposed Action and the increased level of detail that is evident in the Revised PA. We appreciate your efforts in developing not only a scientifically rigorous evidence-based Proposed Action but a site-specific one as well. You and your staffs are to be commended.

Response: Thank you for noting that the time invested to further engage partners while we proceeded from the draft proposed action to the revised version was evident.

Comment 32-3 (Cara 6-26): The following comments are specific to the science component of your proposal. We think that these suggestions will strengthen the DEIS development. We look forward to continuing to provide assistance as you work through your analysis. The Ecological Restoration Institute (ERI) respectively submits the following comments for your consideration. The first three comments relate to general themes we recommend addressing throughout your analysis as you develop the DEIS; comments 5-7 relate more specifically to topics discussed within the P.A.

Response: Thank you. We have carefully considered and responded to each recommendation.

Comment 32-4 (Cara 6-2): 1. In the overview and throughout the DEIS, we think it would strengthen the documents to clearly articulate and resolutely maintain an emphasis on ecosystem management as the overarching context for discussing individual resource management conditions, goals, and activities. This would explicitly comport with the intent of the CFLRP Act.

Response: Thank you. The purpose and need for action is based on the objective of putting the project area on a trajectory towards comprehensive, landscape-scale restoration with benefits that

include improved vegetation biodiversity, wildlife habitat, soil productivity, and watershed function. How the proposed action moves towards the desired conditions will be disclosed in the environmental analysis as part of the environmental consequences. Consistency with the CFLR will be addressed in the DEIS and FEIS/ROD.

Comment 32-5 (Cara 6-28): 2. Explain how and why prescriptions are adjusted, and what the scientific basis for these adjustments is, when conflicts arise between desired conditions: a) site-specific reference conditions as indicated by presettlement evidence, and, b) desire to balance tree age/size classes or maintain certain levels of canopy cover for wildlife habitat (and see examples in comment 5 below)

Response: For clarification, prescriptions will not be part of the analysis as the actual on-site review that is conducted as part of preparing for implementation will determine what silvicultural prescription is most appropriate for the site. Where forest plan direction dictates an action, such as balancing tree age/size classes or meeting minimum canopy cover requirements, the silvicultural prescription would be written to comply with this direction, regardless of how it may conflict with other ecological restoration objectives unless forest plan variances have been proposed and approved. This discussion is currently within the proposed action. Coconino NF and Kaibab NF forest plan variances are proposed where savanna treatments would occur in order to address/resolve the conflict between moving towards desired conditions. In order to move towards desired conditions in non-PFA goshawk habitat, there may be a need to have less than 3 to 5 reserve trees and it may not be possible to attain a 40 percent canopy cover condition. Regarding the use of presettlement evidence, it is one tool that would be used to guide treatment design. Other indicators of site quality used in treatment design include site index, plant associations, and the soils/terrestrial ecosystem survey (TES).

Comment 32-6: (Cara 6-4) 3. Narratives describing historical conditions should be supported by the best available science (i.e., citations from original research where available). Clearer distinction should be made between statements that are science-supported versus expert opinion or assumptions not supported by strong science.

Response: Thank you for your recommendation. We have reviewed the purpose and need section and have added citations where appropriate. In those cases where the information originates from a Forest Service report or assessment, such as the ecological and socio-economic assessments prepared for the forest plan revision efforts, the citation is to that planning document which in turn cites and references a wealth of literature. The vegetation report includes a section on supporting science of the desired conditions which includes a heavily referenced narrative of historical conditions specific to the 4FRI Coconino and Kaibab NFs project area.

Comment 32-7 (Cara 6-5): 4. Generally, throughout science citations should point to original research with regional relevance as opposed to syntheses or opinion papers.

Response: See our response to comment 32-6.

Comment 32-8 (Cara 6-6): 5. As you develop the DEIS, please make explicit the links between desired conditions, supporting science and the specific treatments to achieve those desired conditions. For example: a. P. 8: in the purpose and need, first bullet: please define what "desired conditions" are based on to justify the "mosaic of interspaces and tree groups ... " Suggested addition: " ... towards desired conditions as determined by forest structural reference conditions typical of when natural disturbances were intact".

Response: Thank you. Your recommendation has been incorporated into the purpose and need.

Comment 32-9 (Cara 6-7): b. P.8: We understand that some desired conditions in the PA deviate from reference conditions. However, because the goal is landscape restoration, we urge you to justify departures from reference conditions using the best scientific evidence available. Thus, we recommend the EIS adequately address when reference conditions are used, how they are being used (presettlement evidence, literature, etc.). When departures from reference conditions are used, please link desired conditions to the best available science with clear, scientifically informed justifications. Currently, use of presettlement evidence to determine reference condition is mentioned only on p. 10 (Canopy Cover) and p.49 (Savannah treatment). Realizing that some stakeholders may examine only portions of the document, we think citation of presettlement conditions as a starting point should be throughout the document.

Response: Thank you for your recommendations. We have reviewed the purpose and need and added citations and additional references to HRV. The instances where there would be departure from HRV in desired conditions is driven by Coconino and Kaibab NFs forest plan requirements typically associated with habitat including MSO PACs, MSO threshold, MSO target threshold, MSO restricted, and goshawk PFA and non-PFA habitats. In some cases, forest plan variances have been included in the action alternatives in order to move closer toward HRV.

Comment 32-10 (Cara 6-8): c. P. 9 Canopy Openings: In table 1 please provide desired conditions for canopy cover, with scale noted, citing scientific evidence. Suggested scientifically rigorous ecological restoration references include: i. White (1985): Percent of 7.3-ha study area occupied by presettlement tree groups: 22% (GPNA) ii. Covington and Sackett (1986): Canopy area of sawtimber: 17.3 % (Chimney Springs) iii. Covington et al. (1997): Percent of surface area under pine canopy in 1876: 19% (reconstruction at GPNA) IV. Fule' et al.(2002): Average canopy cover at reference sites: 49.7% (range 15.4-79.2%; Powell Plateau GCNP); 48.3% (range 0.3-85.5%; Rainbow Plateau GCNP) v. Sanchez Meador et al. (2011): Average canopy cover reconstructed on Woolsey plots: 10.2% (SIB Ft Valley); 15.80/0 (SIAft Valley); 14.1%(S4B Sunset Crater); 13.6% (S4A Sunset Crater); 16.7% (S5B2 Coulter Cabin); 18.8% (S5B3 Coulter Cabin)

Response: Thank you for your recommendations. This section has been edited.

Comment 32-11 (Cara 6-9): d. Editorial Comment: p. 10, first sentence of last paragraph: Great project description of desired condition: Move to Forest Structure introduction (p. 8) to help clarify the overall desired conditions that are later expressed more explicitly for your sub-headings (Canopy cover ... Age and Size Class, etc.).

Response: Thank you for the suggestion. We think it helps clarify the desired condition.

Comment 32-12 (Cara 6-10): P. 12 Age and Size Class Diversity: Please add citations for this desired condition as based on goshawk guidelines (Reynolds 1992), and discuss this in the context of ecological restoration and departures from reference conditions.

Response: Thank you for your suggestion. We added citations (from the forest plans) and have added further clarification on how a lack of age and size class diversity affects ecological function.

Comment 32-13 (Cara 6-11): f. P. 16 Old Growth: Cite the data used to develop old-growth % at multiple scales

Response: Thank you for your suggestion. Additional language has been added to the old growth section to clarify that stand exam and habitat classification data was used to evaluate old growth.

Comment 32-14 (Cara 6-12): g. P. 21 Insect and Disease: Desired condition is to have mistletoe that is comparable with reference (HRV) conditions. Please cite (see Hawksworth papers and Woolsey 1911 reports).

Response: Thank you for your suggestion. We have added additional language which clarifies that moving towards forest structure HRV is the desired condition as this would allow dwarf mistletoe and beetles to function at endemic or historic levels.

Comment 32-15 (Cara 6-13): h. P. 22. Vegetation Diversity and Composition: please cite statement that grasslands decreased from 8% to 3 % and clearly state if this is based on professional opinion, resource information, or scientific publications.

Response: Thank you for your suggestion. We have added language and citations from the ecological sustainability reports that were developed for the forest plan revision effort in 2008 (Kaibab NF) and 2009 (Coconino NF). These documents provide the degree of departure from historic conditions.

Comment 32-16 (Cara 6-14): i. P. 24 (big sage discussion). Please cite desired shrub cover condition (9 - 14%) or clearly state if this is based on professional opinion, etc. (see i).

Response: The desired condition for shrub cover condition was determined from evaluating each the forests' TES survey. This section also used the term canopy cover in the context of the TES survey (Brewer et al. 1991) as a criterion describing the relative dominance of each species, of potential productivity, of the influence of plants on precipitation interception and soil temperatures, and of the value of vegetation to animals. Because this may be interpreted as a need to meet forest plan goshawk canopy cover requirements, we have edited the desired condition to provide additional clarity.

Comment 32-17 (Cara 6-15): j. P. 28 Fire Ecology. Table 11: Please cite desired conditions for fire behavior or clearly state if this is based on professional opinion, etc. (see i).

Response: We edited this section to provide additional citations to HRV, the desired fire-return interval and desired fire behavior.

Comment 32-18 (Cara 6-16): k. P. 30 Seeps and Springs: Clearly state if reference conditions exist for water flow patterns, recharge rates and geochemistry, and if not, what best science is being used to determine desired conditions (see i).

Response: Currently, information related to spring ecosystems within the project is minimal with reference conditions related to flow pattern, recharge rates, and geochemistry largely unknown. Currently, the Coconino and Kaibab National Forests are working cooperatively with the Ecological Restoration Institute (ERI) at Northern Arizona University (NAU), the Museum of Northern Arizona (MNA), and the NAU School of Geology on a 2-year project to conduct assessments of spring ecosystem conditions across the two forests. Two hundred springs will be assessed using the Spring Ecosystem Assessment Protocol (SEAP) developed by Stevens and

Springer (2005)². The assessment will include collection of data related to (1) aquifer and water quality condition, (2) geomorphology, (3) habitat characteristics, (4) biota, (5) human impacts, and (6) administrative context (i.e., existing water rights, forest plan compliance, etc.). These data will inform spring restoration objectives and needs for both forests.

Comment 32-19 (Cara 6-17): 6. As you develop the DEIS, please consider consistent use of geographic units to report habitat types, forest types and treatment summaries. This will add clarity to desired conditions and how they are stepped down to spatially explicit treatment types. Restoration Unit summaries are used inconsistently. Restoration Sub-units are mentioned [...] in the first section, but only once again (old-growth). Recommend described desired conditions and recommended treatments to achieve those desired conditions by Restoration Unit.

Response: Scales to be used for this analysis will be determined by resource specialists as they must determine how to evaluate and disclose environmental consequences that will meet law, regulation, policy, and forest plan requirements.

Comment 32-20 (Cara 6-18): a. Tables 15-16: suggest these summary tables breakout by restoration unit and forest type as well as key wildlife habitat type, which have defined desired conditions in pgs 8 - 35; currently it is not linked to desired condition for each of the restoration units.

Response: Thank you for your comment. Since what has been presented has been limited to a concise summary of the purpose and need and proposed action, it is not possible (or desirable) to add summary tables by analysis unit, forest type, and habitat type. The specialist reports for vegetation and wildlife will include detailed tables by analysis unit, forest, and habitat type as appropriate. In the DEIS, this information will be summarized as part of the affected environment and environmental consequences for vegetation and wildlife.

Comment 32-21 (Cara 6-19): 7. Please clarify how treatment types are intended to meet the purpose and need to restore landscape structure, function, and composition.

Response: Additional information has been added which includes treatment objectives for each treatment type. How treatments move towards desired conditions will be part of the environmental consequences for all resources.

Comment 32-22 (Cara 6-20): a. P. 45 UEA thinning: We recommend the range of desired BA (50 - 70 if/acre) listed in the P A may be too narrow to adequately achieve desired conditions as categorized by "intensity" and should be broadened to 30 - 90 if/acre to adequately address effects of treatments.

Response: Thank you for your recommendation. The post-treatment basal area in savanna treatments would average less than 50 basal area. Coconino and Kaibab NFs Forest Plan amendments have been developed for savanna treatments. Target stand densities for other treatments were designed to meet forest plan (habitat) requirements. We do not expect to fully meet desired conditions on the first entry over a majority of the sites; however, the BA range would begin to move the proposed treatment area towards the desired conditions

² The protocol can be found at <http://www.springstewardship.org/assessment.html>.

Comment 32-23 (Cara 6-21): b. P. 53 Burn Only: What are the assumptions (in terms of current condition) used to assign a burn-only treatment in terms of meeting desired conditions; please cite primary research that supports these assumptions. We are not aware of any such scientific evidence

Response: The first filter involved a review of five data sets. The data sets were used to create and evaluate mechanical treatment ranking. Three of the data sets were based on stand data, one was based on soil strata, and one was based on the distance from roads. The three stand-based data sets are silviculture priority, timber suitability, and age structure. Silviculture priority provides a point (Pt/Pts) rating of the departure from desired conditions based on site class and SDI rating. A second filter considered large contiguous areas, the practicality of treatment given remote locations, total acreage, whether extreme dwarf mistletoe infection was present (if present, the acreage would be deferred from mechanical treatment) and the opportunity to add heterogeneity to the landscape.

Comment 32-24 (Cara 6-22): c. P. 57 Seeps and Springs: Please list citations for burn intervals to justify returning fire to seeps and springs.

Response: Citations for the desired burn interval appears in the fire ecology section. We feel this is sufficient.

Comment 32-25 (Cara 6-23): d. P.75 Management Approach. Large (>16" dbh) post-settlement pine trees may be removed to meet restoration objectives according to the following criteria: Recommend the definition of "Large (> 16" dbh)" should reference definition from the Path Forward. "The group has agreed to a large tree retention strategy that is not based on a strict diameter cap. Large trees in the ponderosa pine forest type.

Response: Thank you. The definition of a large tree has been included. As you know, we have been working through this issue. As displayed in our draft issues and draft alternatives that were shared at the March 2011 NEPA update public meeting, alternative C would incorporate a modified version of the Large Tree Retention Strategy (LTRS). Alternatives B and D would not. We hope to have further discussion with the public prior to the release of the DEIS and during the 45-day comment period for the DEIS.

Comment 32-26 (Cara 6-24): The ERI is committed to making the 4FRI a success. We look forward to working with the Forest Service and the stakeholders to provide assistance through all phases of the Initiative.

Response: Thank you for your constructive comments. We look forward to working with you.

Letter 33-20110901 – Taylor McKinnon - Center For Biological Diversity and Sharon Galbreath - Sierra Club (Cara Letter #9)

Comment 33-1: (1) PARTIES TO COMMENTS The following individuals and organizations are party to these comments. A. CENTER FOR BIOLOGICAL DIVERSITY The Center for Biological Diversity ("Center") submits the following comments in response to the Draft Revised Recovery Plan (DRP) for the Mexican spotted owl (*Strix occidentalis lucida*) issued by the U.S. Fish and Wildlife Service on 24 June 2011. FR 76 37141. The Center for Biological Diversity is a non-profit public interest conservation organization dedicated to the protection of native species and their habitats through science, policy and environmental law. The Center has over 320,000

members and online activists throughout the United States, including members that live in the current and historic range of the Mexican spotted owl. Other members travel to these areas for education, work, scientific study, recreation, and enjoyment.

B. SIERRA CLUB GRAND CANYON CHAPTER The Sierra Club's mission is "to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environments." Inspired by nature, the Sierra Club's more than 1.3 million members and supporters work together to protect our communities and the planet. Our members have a significant interest in this proposed action as we have been very involved in protection of Arizona's public lands and the wildlife that depend on them.

Response: This comment contains general information and no response is needed.

Comment 33-2: (2) THE PROPOSED ACTION ALLOWS OLD GROWTH LOGGING; OLD GROWTH LOGGING SHOULD BE ELIMINATED FROM ALL ACTION ALTERNATIVES
The proposed action allows for logging old growth trees—trees that established prior to the disruption of natural fire regimes. The proposed action should prohibit old growth logging consistent with the stakeholders' Old Growth and Large Tree Retention Strategy.

Response: No action alternative proposes to log pre-settlement trees. The Old Tree Retention Strategy (OTRS), which has been made integral to each action alternative (B, C, and D), provides language to this effect, and the OTRS has been incorporated into each action alternative's design features, monitoring and adaptive management plan, and implementation plan. The key intent of the LTRS was incorporated into alternative C.

Comment 33-3: (3) THE STAKEHOLDER LARGE-TREE RETENTION STRATEGY SHOULD FORM THE BASIS OF THE PREFERRED ALTERNATIVE
The Forest Service should have included the Large Tree Retention Strategy as a basis for the proposed action; the Forest Service has the authority to include the Large Tree Retention Strategy as a basis of a preferred alternative in the EIS. Section 1502.14(e) requires the section of the EIS on alternatives to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement . . ." This means that if the agency has a preferred alternative at the Draft EIS stage, that alternative must be labeled or identified as such in the Draft EIS. By the time the Final EIS is filed, Section 1502.14(e) presumes the existence of a preferred alternative and requires its identification in the Final EIS "unless another law prohibits the expression of such a preference." The lead agency's official with line responsibility for preparing the EIS and assuring its adequacy is responsible for identifying the agency's preferred alternative(s). The NEPA regulations do not dictate which official in an agency shall be responsible for preparation of EISs, but agencies can identify this official in their implementing procedures, pursuant to Section 1507.3 The "proposed action" may be, and often is, the agency's "preferred alternative." The proposed action may be a proposal in its initial form before undergoing analysis in the EIS process. If the proposed action is [46 FR 18028] internally generated, such as preparing a land management plan, the proposed action might end up as the agency's preferred alternative. On the other hand the proposed action may be granting an application to a non-federal entity for a permit. The agency may or may not have a "preferred alternative" at the Draft EIS stage. In that case the agency may decide at the Final EIS stage, on the basis of the Draft EIS and the public and agency comments, that an alternative other than the proposed action is the agency's "preferred alternative." The Memorandum of Understanding

between the 4FRI stakeholders and the Forest Service describes the Forest Service's role in that process: A. Work directly with parties at all phases of the NEPA process, seeking their input and agreement on: the purpose and needs statement, alternatives, collection and use of data, impact analysis, development of a preferred alternative, and/or recommendations regarding mitigation of environmental impacts (CEQ Handbook, p. 13); B. Strive to accommodate the agreement-based outcomes and products of the collaborative process within 4FRI, recognizing that translation of such agreement greatly enhances chances for success, and reduces the risk of conflict; C. Establish long term restoration strategies to ensure that restoration is comprehensive, science-based, consistent, and coordinated between successive landscape-scale restoration projects; and D. Develop and/or maintain long-term contracts and or agreements that support appropriately-scaled industry involvement. MOU at 4. The nature of engagement in the NEPA process is further explained as follows: The U.S. Forest Service and the 4FRI Collaborative will work together through all phases of the NEPA process potentially including the framing of the issues, the development of a range of reasonable alternatives, the analysis of impacts, and the identification of the preferred alternative up to, but not including, the agency's final decisions made by the relevant Line Officer (CEQ Handbook, p. 13); MOU at 4. The Large Tree Retention Strategy, an "agreement-based outcome and product" was developed in the context of those expectations "recognizing that translation of such agreement greatly enhances chances for success, and reduces the risk of conflict." With deadlines driven by the Forest Service's development of the proposed action, the Large Tree Retention Strategy was developed in the context of this collaborative engagement. Its explicit and implicit purpose was to inform and provide a basis for the proposed action that further defined the "social license" for landscape scale restoration requested by Regional Forester Newman; the LTRS was developed to further define that "social license." The Forest Service further emphasizes the importance of that social license in its selling of the CFLRP 4FRI proposal. It states: The 4 Forest Restoration Initiative (4FRI) is an outgrowth of nearly a decade of collaborative efforts and analyses focused on accelerating forest restoration in northern Arizona. The central theme of these activities has been the broadly-recognized need to accelerate forest restoration and to shift restoration and management efforts from a short term, project-by-project basis to an integrated, landscape-scale program. After years of gridlock, resulting from intense disagreement over the direction of forest management, there is now an opportunity to move forward with accelerated, landscape-scale restoration at an unprecedented pace and scale. The current social support for landscape-scale restoration in northern Arizona presents an historic opportunity that should be recognized and acted upon immediately. CFLRP 4FRI Proposal at 2. For these reasons, it is entirely reasonable for stakeholders to have expected the Forest Service to have included the LTRS as a basis for the proposed action. That the Forest Service did not was a surprise and disappointment to many, including our organizations. It cast doubt on the Forest Service's ability and willingness to collaborate, and resulted in a proposed action whose permissiveness precludes support from much of the conservation community, including our organizations. The Forest Service now has the authority and the mandate to include the LTRS as a basis for a preferred alternative. The Forest Service has articulated in various ways the importance of developing agreement around landscape scale restoration, and it has articulated its intent and desire to translate agreement into action. The LTRS forms a critical part of the historic agreement now before us; it should form the basis for the preferred "4FRI" alternative in the NEPA process.

Response: Since the August, 2011 revised proposed action was made available for comment, we have been engaging the public and working through unresolved issues and points of debate with the proposed action, including the stakeholder-developed LTRS. To address emerging issues and

clarify scoping comments, a meeting was held with commenters to discuss the conservation of large trees on October 14, 2011. At this meeting, it was clarified that what was most important was including the intent of the LTRS in the proposed action alternative.

The concern surrounding the conservation of large trees was identified as a key issue for this analysis. The issue statement reads: "The large tree retention strategy (LTRS) which was developed by the 4FRI stakeholders was not included in the proposed action. Large post-settlement trees, as defined by a socio-political process, are those greater than 16 inches in diameter-at-breast height (dbh). The intention of the exception process within the LTRS was to increase landscape heterogeneity and conserve biodiversity. The LTRS represents social agreement between parties that greatly enhances the chance for landscape restoration to succeed and reduces the risk of conflict. If the LTRS is not incorporated, the current social support for landscape-scale restoration may be withdrawn. In addition, it may result in the removal of key ecosystem components that include nesting and roosting habitat and large woody debris that is important for wildlife".

In response to this issue, the vegetation analysis will evaluate how proposed treatments affect vegetation structural stages (VSS), including those trees that would be 16-inch dbh or larger. The vegetation analysis on tree age and size class diversity will be used to inform the wildlife effects analysis. Alternatives B (proposed action alternative) and D do not incorporate the LTRS. However, alternative C responds to this issue by incorporating the key components of the LTRS and focusing on ecological desired conditions. It identifies circumstances where large, post-settlement trees may be removed to move towards or meet desired conditions. The intent of the LTRS has been incorporated into the alternative's design criteria, the monitoring and adaptive management plan, and the project implementation plan. The indicators used to evaluate this issue are: (1) a quantitative pre-treatment and post-treatment evaluation for MSO, goshawk, old growth, and VSS for goshawk at four scales (including the landscape scale) to qualitatively gauge movement towards restoration desired conditions and (2) a qualitative analysis of pre-treatment and post-treatment non-market social values that include large trees, public safety, and other biodiversity objectives that may conflict with protection of large trees.

At this time, the forest supervisors have not selected a preferred alternative. Section 1502.14(e) requires the section of the EIS on alternatives to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement". This means that if the agency has a preferred alternative at the draft EIS stage, that alternative must be labeled or identified as such in the draft EIS. If the responsible federal official in fact has no preferred alternative at the draft EIS stage, a preferred alternative need not be identified there. By the time the final EIS is filed, Section 1502.14(e) presumes the existence of a preferred alternative and requires its identification in the final EIS "unless another law prohibits the expression of such a preference."

Comment 33-4: 4) THE FOUR FORESTS INITIATIVE SHOULD BE ANALYZED IN ONE PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT We remain concerned that a programmatic EIS followed by tiered, site-specific actions would best serve the 4FRI project, and that the scale of the Proposed Action may preclude satisfying NEPA's site-specific requirements. In the case of 4FRI, the Forest Service has clearly made a comprehensive proposal, of which the proposed action is but one component part, and whose satisfaction and completion necessitates subsequent similar action(s). The proposed and subsequent 4FRI actions are interdependent parts of a larger action and depend on the larger action for its justification. The Forest Service

articulates the 4FRI as a comprehensive proposal in the Collaborative Forests Restoration Act Proposal as follows: The 4FRI vision is to undertake, across approximately 2.4 million acres of ponderosa pine forest, landscape-scale restoration that will support: resilient and diverse forest ecosystems; populations of native plants and animals; thriving communities in forested landscapes that have little threat of destructive wildfire; and appropriately-scaled, sustainable, forest products industries that strengthen local economies, while conserving natural resources and aesthetic values. 4FRI CFLP Proposal at 1. The goal of the 4FRI is to achieve ecological restoration across ~2.4 million acres of contiguous ponderosa pine forest on National Forest System lands in northern Arizona. (Emphasis added.) Restoration can be defined as a suite of intentional actions that initiate or accelerate ecosystem recovery with respect to health (functional processes), integrity (composition & structure), and sustainability (resilience & resistance to disturbance). 4FRI CFLP Proposal at 2. The Forest Service further 4FRI as a single restoration effort in the first sentence of the Proposed Action. It states: The Four-Forest Restoration Initiative (4FRI) is a planning effort designed to restore forest resiliency and function across four National Forests in Arizona including the Coconino, Kaibab, Apache-Sitgreaves and Tonto (figure 1) (emphasis added). PA at 1 (first sentence). There are numerous other examples in various Forest Service and 4FRI documents that describe the 4FRI as a comprehensive, 2.4 million acre restoration program, upon which multiple component actions, such as this proposed action, do and will depend on for their justification. As such, the appropriate analysis for 4FRI is a single, programmatic EIS with subsequent tiered, individual actions. This sort of NEPA framework would also be far better suited to 4FRI's program-level needs like monitoring, adaptive management, and strategic sequencing of treatments.

Response: Our response to this contention has not changed since we responded to comments received 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 ROD issued in late 2012 or early 2013) 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 (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. Please provide specific examples of where Coconino NF and Kaibab NF proposals, 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)). If the goal is truly to affect landscape restoration as quickly as practicable, we do not understand how taking 1 to 2 years (or more) to conduct a programmatic EIS that would then require numerous, multiple analyses moves towards this objective. The issue of moving forward with a programmatic EIS versus as project specific EIS was discussed with CEQ as early as 2009 when the landscape restoration proposal was being prepared as a CFLR proposal. Stakeholder representatives were on the conference call. The notes from this call are available or can be found in the project record.

Comment 33-5: 5) USING THE NEW GOSHAWK GUIDELINES AND METHODOLOGY IS UNLAWFUL AND MAY RESULT IN UNFORSEEN IMPACTS TO NORTHERN GOSHAWK AND ITS PREY In 2007, the Center for Biological Diversity filed an administrative objection to the Jack Smith-Schultz project relating to the Coconino National Forest's use of the New Goshawk Guidelines and methodology. The objection described inconsistencies between the New Goshawk Guidelines and Methodology and mandatory standards and guidelines set forth in the 1996 Record of Decision amending all national forest plans in Arizona and New Mexico, including the Coconino National Forest Land and Resource Management Plan. The objection described how the New Goshawk Guidelines would leave far less canopy and far fewer large trees than is allowed by prevailing forest plan direction. It also described how that reduction in canopy and large tree densities had never been analyzed under NEPA or NFMA, and that it could thus have deleterious effects to northern goshawk and its prey species that have not previously been considered. The objection also described how a decision implementing the New Goshawk Guidelines and methodology in that project would violate the National Forest Management Act and National Environmental Policy Act. In their review of that objection, Forest Service officials affirmed the Center's points and conceded that the New Goshawk Guidelines were indeed inconsistent with Forest Service standards and guideline; the Forest Service undertook a new analysis and issued a new environmental assessment for the Jack Smith-Schultz project, bringing it into compliance with the standards and guidelines in forest plans. Remarkably, the Forest Service is now proposing to extrapolate that very same mistake across 750,000 acres.

Response: The Forest Service is not aware of a document title "*New Goshawk Guidelines*." This analysis has been using the guidance and direction described in the respective forest plans which refer to USDA Forest Service General Technical Report RM-217 entitled "*Management Recommendations for the Northern Goshawk in the Southwestern United States*" for scientific information on goshawk ecology and management, which provide the basis for the management guidelines. The Kaibab NF developed the "*Implementation and Interpretation of Management Recommendation for the Northern Goshawk*", Version 3.0, August, 2009 (KNF I&I) to provide guidance on correlating stand density index (SDI) and basal area with canopy cover. However, there is no mandate to use the KNF I&I. It is not a forest plan document, and it does not add to or change any of the direction in the Kaibab Land Management Plan. The Coconino NF does not have a similar guidance document.

Since the August, 2011 scoping period, we have continued to work on points of debate or disagreement with the proposed action, including the issue of canopy cover. On December 15, 2011, those people who had voiced a concern on canopy cover were asked to discuss canopy cover in relation to the forest plans' goshawk guidelines. The concern surrounding post-treatment canopy openness and resultant compliance with the forest plans was identified as a key issue for this analysis. The issue statement reads: "Measuring canopy cover in goshawk habitat at the group level will not meet forest plan stand-scale canopy requirements. A reduction in canopy and large tree densities have never been analyzed under NEPA and NFMA and could have deleterious effects to goshawk, its prey species, and those wildlife species that are dependent on that cover. Because natural openings would no longer be included within the VSS classification, it would result in significantly more lands being in an open condition or outside of the VSS 4 to 6 classifications. This could substantially increase the logging of mature and old trees and negatively affect wildlife, including goshawk and its prey species."

All action alternatives (B, C, and D) have been designed to measure canopy cover in compliance with the forest plans. The analysis will describe how canopy cover will be measured, address the

inter-relationship between the canopy cover analysis to old and large trees, and disclose forest plan consistency. The analysis will be conducted at four scales even though three scales is the requirement. To address the need to add clarity for interspaces and the relationship between interspaces, openings, and VSS classes, non-significant plan amendments have been developed for alternative B, C, and D. To address post-treatment openness and canopy cover where the desired condition is to move towards an open ponderosa pine (savanna) reference condition, non-significant forest plan amendments were developed for alternatives B, C, and D for both forests. The amendments would allow select acres to be managed for less than 40 percent canopy cover in VSS 4 to VSS 6 and less than 3 to 5 reserve trees per acre. The indicators used to evaluate this issue are: (1) Pre-treatment and post-treatment distribution of habitat structure within goshawk habitat evaluated at four scales, including: ponderosa pine extent, restoration unit, restoration subunit, and strata (groups of like stands with like treatments). Overall habitat structure (VSS class) and forest density metrics (basal area, stand density index, and trees per acre) would be averaged to a per acre basis with averages including interspaces, canopy gaps, and all forest structural stages, (2) percent post-treatment change in forest structure (VSS 1 to 6) including changes in acres of open (non-forested) and forested habitat and the degree of canopy closure (VSS canopy closure categories) in relation to individual species or species assemblage habitat requirements (e.g., nesting, roosting, calving and fawning habitat, and thermal and hiding cover) at multiple scales including treatment unit, sub-unit, and restoration unit, and (3) the percent change in herbaceous understory (expressed as pounds of biomass) and a qualitative analysis of impacts to individuals and groups of species. Additionally, the Forest Service has worked with researchers from Northern Arizona University, the Ecological Restoration Institute, the Grand Canyon Trust, the Center for Biological Diversity and GIS specialists from the Forest Service's Southwestern Regional Office to help inform the canopy cover discussion (additional documentation is available in the project record).

Comment 33-6: The Forest Service is proposing to use the exact same New Goshawk Guideline methodology in the 4FRI proposed action that it determined was unlawful in Jack Smith-Schultz project. In both cases, the proposal to use the New Goshawk Guidelines runs afoul of requirements in Land and Resource Management Plans, the National Forests Management Act, and the National Environmental Policy Act, and may have deleterious effects to northern goshawk and its prey species by lowering canopy cover and large tree densities below any thresholds previously analyzed.

Response: Please see our response to comment 33-5.

Comment 33-7: Center for Biological Diversity staff have now raised this issue 61 separate times to the Forest Service in various 4FRI meetings, including in our written comments on the draft proposed action. We have been clear that this is an illegal course of action that cannot be taken. Despite this, and as evidenced by treatment descriptions in both the proposed action and the 4FRI RFP, the Forest Service has shown no desire to change its knowingly unlawful course of action. We note that fact here explicitly for the record.

Response: Please see our response to comment 33-5.

Comment 33-8: A. IMPLEMENTING THE NEW GOSHAWK GUIDELINES METHODOLOGY WOULD FIRST REQUIRE AMENDING LAND AND RESOURCE MANAGEMENT PLANS Commenting parties have on numerous occasions expressed concern to the Forest Service that reliance on the New Goshawk Guidelines in the Four Forests

Restoration Initiative will violate NFMA and NEPA. Still, the Forest Service relies on the New Goshawk Guidelines' methodology silvicultural prescriptions proposed in the Four Forests Restoration Initiative Proposed Action. On February 23, 2007, the Forest Service completed the new "Implementation Guide, Region 3, Northern Goshawk Standards and Guidelines" ("New Goshawk Guidelines"), which significantly changed how northern goshawks and goshawk habitat is managed in Region 3. See e.g., Jack Smith Draft EA, p. 17 (acknowledging that managing canopy cover at the group level is a shift in how the District has implemented the Northern Goshawk Standards and Guidelines, and the shift is responsive to the New Goshawk Guidelines); Jack Smith Draft EA, p. 221 (Arizona Dept. of Game and Fish comments stating that previous projects planned canopy cover levels at the stand level, and that the change to the group level, resulting from the New Goshawk Guidelines, "has the potential to significantly reduce the amount of forest cover within treated areas."); Jack Smith Draft EA, p. 247 (Forest Service acknowledging that in the past, it typically quantified data at the stand level, but that the New Goshawk Guidelines emphasize measurements at the group level).

Response: Please see our response to comment 33-5. Regarding your inclusion of a comment by ADGF, we contacted ADGF since the reference to this comment has been brought up twice. They responded, "CBD [Center for Biological Diversity] refers to Department comments on the Coconino National Forest Jack Smith/Schultz Fuels Reduction and Forest Health Project from 2007. The referenced ADGF comments pertain to shifts in methodologies for measuring canopy cover. The comments referred to by CBD were from a project that was scoped 4 years ago. Since that time, ADGF has been working closely with the Forest Service to better understand how desired conditions for wildlife in the ponderosa pine type will be met despite the shift in canopy cover measurement. While we continue to track this issue, we believe the FS emphasis on uneven aged forest conditions of variable density with an emphasis on clumpy-group structure and interlocking canopies for wildlife is a better way of thinking about forest structure than thinking about it in terms of percent canopy cover. We believe that through monitoring we can learn from this assumption and seek adaptive management if necessary to provide adequate forest cover for wildlife. More importantly, the Department did not raise this issue in the context of the current 4FRI project. Therefore we want to make it clear for the project record that CBD is not referring to ADGF comments on the 2011 4FRI Coconino-Kaibab Project."

Comment 33-9: The following schematic demonstrates the actual difference between stand- and group-level canopy cover. The schematic describes silvicultural treatments in a way consistent with the proposed action, listing the amount of forested (tree groups) and non-forested (openings) that would exist after cutting. Because this schematic relies on drip lines rather than root zones to describe "forested" areas, and because root zones extend beyond drip lines, it overestimates stand-scale canopy cover. This schematic demonstrates that most treatments proposed will fall short of stand-scale canopy cover requirements set forth in the 1996 Record of Decision and Forest Plans; likely to have effects to wildlife species dependent on that cover

Response: Please see our response to comment 33-5.

**Comment 33-10: B. IMPLEMENTING THE NEW GOSHAWK GUIDELINES
METHODOLOGY VIOLATES THE NATIONAL FORESTS MANAGEMENT ACT**

Commenting parties have on numerous occasions expressed concern to the Forest Service that reliance on the New Goshawk Guidelines in the Four Forests Restoration Initiative will violate NFMA. Still, the Forest Service relies on the New Goshawk Guidelines methodology in the Four Forests Restoration Initiative Proposed Action. Pursuant to NFMA, "the Forest Service must

demonstrate that a site-specific project would be consistent with the land and resource management plan of the entire forest.” *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1377 (9th Cir. 1998), citing 16 U.S.C. § 1604(i); 36 C.F.R. § 219.10(e). In 1996, the Forest Service amended all Forest Plan in the Southwest Region, including the CNF and KNF Plans, to provide additional standards and guidelines for northern goshawks. Appendix C to the 1996 Record of Decision for the northern goshawk plan amendments sets forth the mandatory standards and guidelines for ecosystem management within Northern goshawk habitats, and these standards and guidelines have been incorporated into the CNF and KNF Plan. See CNF Plan at 65-7 through 65-11. These standards and guidelines apply to all forested lands that are outside the protected areas for the Mexican Spotted Owl.

Response: Please see our response to comment 33-5.

Comment 33-11: C. IMPLEMENTING THE NEW GOSHAWK GUIDELINES METHODOLOGY VIOLATES THE NATIONAL ENVIRONMENTAL POLICY ACT

Commenting parties have on numerous occasions expressed concern to the Forest Service that reliance on the New Goshawk Guidelines in the Four Forests Restoration Initiative will violate NEPA. Still, the Forest Service relies on the New Goshawk Guidelines in the Four Forests Restoration Initiative Proposed Action. NEPA requires federal agencies to prepare an EIS for any major federal action which may significant impact the quality of the environment. 42 U.S.C. § 4332(2)(C). The agency may first prepare an EA to determine whether an EIS is required. 40 C.F.R. § 1501.4. The Forest Service’s New Goshawk Guidelines for Region 3 make significant changes to the standards and guidelines for managing and protecting northern goshawks across the region, and yet the Forest Service failed to prepare either an EA or EIS for the Guidelines, in violation of NEPA. The significance of the changes made by the New Goshawk Guidelines are summarized by the Arizona Department of Game and Fish: All previous FS-GFFP planning projects have planned canopy cover reduction levels at the stand level. In this PA, the FS is proposing target canopy cover ranges at the group level as opposed to the stand level . . . The Department finds that this change has the potential to significantly reduce the amount of forest cover within treated areas. . . Under this proposal, overall canopy cover in this management zone could be reduced to as little as 10% canopy cover if measured across the stand . . . By changing the canopy cover targets from the stand level to the group level, the Department is concerned that the FS may not be meeting the habitat requirements for [14 of the goshawk’s prey species], and also may not be meeting the habitat requirements for the northern goshawk per the 1996 Forest Plan Amendment. Jack Smith EA, pp. 221-222; see also *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998) (stating that an EIS is required if there are “substantial questions” as to whether an action may result in a significant effect on the environment, and that a plaintiff does not need to show that significant effects will in fact occur). By significantly changing the way the Forest Service measures canopy cover and vegetation classes, the New Goshawk Guidelines clearly lead to a significant increase in the harvest of trees across the Region, including as part of the proposed action. This may cause significant environmental impacts to numerous wildlife species across the entire Region, including the northern goshawk, as well as result in adverse impacts to recreation and other uses.

Response: Please see our response to comment 33-5 and 33-8

Comment 33-12: (6) UNFORSEEN TREE MORTALITY SHOULD BE FACTORED INTO SILVICULTURAL TREATMENTS The EIS must describe tree mortality and other structural changes resulting from restoration treatments and from fire management following treatments on

an ongoing basis. That is, the forest structure thinned and un-thinned forest will change over time by virtue of fire effects, climate and other stochastic events. The EIS needs to characterize those ongoing changes and incorporate them into forest modeling. Losses of canopy, large trees, small trees and resulting recruitment of logs and snags will affect long-term forest dynamics, stand development and wildlife habitat suitability. We urge the Forest Service to exhibit caution in so doing: Post-treatment large tree mortality have exceeded planning targets at several restoration sites in northern Arizona.

Response: We have quantified CWD and snags for the existing condition based on forest vegetation simulation (FVS) modeling. These criteria are being tracked by alternative through the mechanical and fire treatment simulations. FVS models both competition mortality and fire effects (mortality). Since the August 2011 proposed action was released for comment, design features and mitigation have been finalized. Many of the design features are aimed at reducing the potential for fire-related mortality in large and old trees.

Comment 33-13: (7) IMPLEMENTING THE NEW GOSHAWK GUIDELINES IN RESTRICTED HABITAT FOR MEXICAN SPOTTED OWL VIOLATES THE ENDANGERED SPECIES ACT Congress enacted the ESA in 1973 to provide for the conservation of endangered and threatened fish, wildlife, and plants and their natural habitats.

Response: No action alternative has treatments designed to meet goshawk forest plan requirements in MSO restricted habitat. Please provide more information on where you believe this is occurring.

Comment 33-14: In order to properly determine old growth habitat, the Forest Service must refer to a specific table included in the both the 1996 Plan Amendment and CNF Plan, which sets forth the detailed, minimum numeric criteria for various forest types, including the size, age, and number of live and dead trees, down trees, and canopy cover. CNF Plan at 70-2. Forested sites must meet or exceed these numeric structural attributes in order to be considered old growth habitat. CNF Plan at 70-1. In addition, the CNF Plan requires the Forest Service to analyze 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. CNF Plan at 70-1; see also New Goshawk Guidelines, p. 11 (“all forest plans require analysis of old growth at multiple scales”). The amount of old growth that can be provided and maintained must be evaluated at the ecosystem management level and be based on forest type, site capability, and disturbance regimes. CNF Plan at 70-1.

Response: The direction in the Coconino and Kaibab NFs Land Management Plans includes:

Old Growth – standard: 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 (Coconino NF Land Management Plan, page 70-1, Kaibab NF Land Management Plan, p. 32)

Old Growth - guideline: All analyses should be at multiple scales - one scale above and one scale below the ecosystem management areas. The amount of old-growth can be provided and maintained will be evaluated at the ecosystem management area level and be based on forest type, site capability, and disturbance regimes (Coconino NF Land Management Plan, page 70-1, Kaibab NF Land Management Plan, p. 32).

Direction specific to the Coconino NF Management Area 3, Ponderosa Pine Mixed Conifer Less Than 40% Slope, Old Growth (Coconino NF Land Management 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 Kaibab NF plan.

For the Coconino NF, forest plan direction for goshawk, old growth, wildlife hiding and thermal cover, and timber resource management reference 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 EMAs. For example, there is no relationship or crosswalk between the EMA to plan management areas. Across the forest, vegetation projects that are required to stratify vegetation and habitat at a scale above and below the EMA have directly linked the EMA 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 EMA was often a conglomeration of 10,000-acre units (Cote, personal communication).

Using a 10,000-acre scale would be 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 is a need to use scales which allow for meaningful analysis from the small scale to the landscape scale. Plan language specifically says blocks may be larger or smaller if approved by the forest supervisor. The Coconino NF supervisor will sign a project record document demonstrating the need, and rationale for, deviating from the 10K analysis. For this analysis, we will disclose the scales of analysis and provide rationale on why this meets the intent of the forest plan. Four scales of analysis have been developed for this project. The smallest scale would be stands or contiguous groups of like-stands averaging 100 acres in size. The equivalent to the EMA would be the restoration sub-unit which ranges in size from 4,000 to 109,000 acres. The scale above the EMA would be the restoration unit which ranges in size from 46,000 to 335,000 acres. For ponderosa pine, the fourth scale is the 512,178 acres of ponderosa pine within the project area. For pinyon-juniper, it is the 23,316 acres of pinyon-juniper within the project area. Please note, the 10K scale of analysis is specific to the Coconino NF. The Kaibab NF uses the term landscape or EMA for the purpose of defining the scale for assessments of existing and desired conditions that lead to specific project proposals. The general size range for the landscape or EMA is thousands to hundreds of acres (Kaibab Land Management Plan, Table 1, p. 8). The Kaibab NF Plan also includes language that allows for some deviation, “To ensure the focus is on the ecosystem, this amended Forest Plan establishes landscapes, or Ecosystem Management Areas (EMAs). For purposes of the Plan, a landscape is usually a contiguous portion of one Geographic Area, or GA. GAs are similar to the larger Management Areas in the original (1988) Plan except for some minor boundary changes and logical combinations made as more complete information about physical resources has been acquired. The smaller Management Areas from the unamended Plan are now referred to as Land Use Zones (LUZs)” (Kaibab NF Land Management Plan, p.7).

Comment 33-15: In contrast to this direction, the Forest Service proposes to classify forests as “old growth” that do not actually meet or exceed the numeric criteria set forth in the forest plans. The proposed action states: There are approximately 508,510 acres of ponderosa pine in the project area. Of this total, 195,338 acres meet old growth conditions. Old growth allocations are based on current conditions within the project area along with forest plan specific management

direction. Currently, all restoration units meet or exceed the 20 percent minimum percentage (table 7) requirement. Table 8 displays ponderosa pine old growth allocations by restoration unit and forest. For ponderosa pine, the old growth allocation acreage/percentage includes: 100 percent of MSO protected habitat; 100 percent of MSO target/threshold; 40 percent of MSO restricted habitat that is uneven-aged with low dwarf mistletoe infection; 80 percent of MSO restricted habitat that is even-aged, mid-aged to old with low dwarf mistletoe infection; 100 percent of goshawk nest stands; 40 percent of goshawk PFA and foraging areas that are uneven-aged with low dwarf mistletoe infection; and, 80 percent of goshawk PFA and foraging areas that are even-aged, mid-aged to old with low dwarf mistletoe infection. Most sites currently do not fully meet the minimum criteria for ponderosa pine old growth conditions as listed in the forest plans. However, the habitat types noted above are closest to meeting old growth conditions. PA at 17. The Forest Service cannot designate “old growth” that does not meet or exceed minimum numeric criteria defining “old growth” in the Forest Plans without violating the National Forest Management Act and National Environmental Policy Act. [...]The Forest Service must analyze and disclose the acres meeting and not meeting those criteria at each of the four analysis scales described in the Proposed Action. This information should be displayed in a chart that is easily understood by public. The chart should clearly depict the number of acres meeting and not meeting old growth criteria within each of the four analysis scales in aggregate and individually (such that forest lands meeting and not meeting old growth criteria are listed for each individual “restoration unit” and “restoration sub-unit,” for example).

Response: In the old growth section of the revised proposed action we stated, “Most sites currently do not fully meet the minimum criteria for ponderosa pine old growth conditions as listed in the Forest Plans. However, the habitat types noted above are closest to meeting old growth conditions. Where management occurs within the ponderosa pine cover type, there is a need to maintain the old growth characteristics within the sites allocated as old growth. A standard in the Coconino NF Land Management Plan reads, “allocate no less than 20 percent of each forested ecosystem management area to old-growth as depicted in the table below” [meeting criteria of dbh, trees per acre, and age by vegetation type and site index]. The plan’s guideline states: “Strive to **create or sustain as much old growth compositional, structural, and functional flow as possible** over time at multiple-area scales. Seek to **develop or retain old-growth function** on at least 20 percent of the naturally forested area by forest type in any landscape” (Coconino NF Land Management Plan, p.70-1). Kaibab NF Land Management Plan old growth direction is found on page 32.

For ponderosa pine, we stated that the old growth allocation acreage/percentage includes: 100 percent of MSO protected habitat; 100 percent of MSO target/threshold; 40 percent of MSO restricted habitat that is uneven-aged with low dwarf mistletoe infection; 80 percent of MSO restricted habitat that is even-aged, mid-aged to old with low dwarf mistletoe infection; 100 percent of goshawk nest stands; 40 percent of goshawk PFA and foraging areas that are uneven-aged with low dwarf mistletoe infection; and 80 percent of goshawk PFA and foraging areas that are even-aged, mid-aged to old with low dwarf mistletoe infection.” Our criteria for “developing old growth” is in alignment with forest plan requirements which include “de facto allocations to old growth such as goshawk nest sites, Mexican spotted owl protected activity centers, sites protected for species behavior associated with old growth, wilderness, research natural areas, and other forest structures managed for old growth functions (Coconino NF Land Management Plan, p.70, Kaibab NF Land Management Plan, pp. 32-33). The term “developing old growth” is synonymous with allocated old growth. The vegetation analysis will depict the number of acres

meeting and not (currently) meeting old growth criteria within each of the four analysis scales in aggregate and individually – although the 4th scale (landscape scale) is not required by the forest plans.

Comment 33-16: (9) ASPEN The Forest Service proposes the following activities within patches of aspen forest: Inclusions of aspen remnants within portions of ponderosa pine stands would be regenerated by removing all post-settlement conifers from within ½ to 1 chain (66 feet) of the aspen clone. Some removal of aspen within the clone as well as ground disturbing activity or burning may occur to stimulate suckering. Each clone would be evaluated to determine the need for fencing or creation of other barriers to reduce ungulate browsing of regenerating aspen. PA at 50, 51. Cutting aspen in the face of abrupt regional aspen decline will only contribute further to that decline and should be eliminated from further analysis. Removing all post settlement conifers from all aspen patches in all circumstances ignores the complex ecology of aspen and may further impair rather than help perpetuate aspen in the project area. For example, some aspen patches may be perpetuated by episodic severe fire or mixed-severity fire fueled by invading conifers; others may have been regenerated by more frequent surface fire, forming multi-aged aspen patches. Because relatively little research has been done on the disturbance ecology of aspens within the upper elevational reaches of the ponderosa pine forests, uncertainties surround appropriate management strategies.

Response: When aspen has been adequately protected after treatment, both forests have had success in maintaining and regenerating aspen. Projects on the Kaibab NF include Government Mountain/Coleman Aspen Restoration (2005), City Project (2005), and Flag Tank Aspen Restoration (2007). Projects on the Coconino NF include Hart Prairie (2010), Little Draw Aspen (2009), and Eastside Fuels Reduction and Forest Health (2006). Other areas where successful regeneration can be found include Priest Draw, Broliar Park, Bear Park, the Highway 180 corridor, and in the vicinity of Hochderffer Hills (Cote, personal communication 2011). The aspen in the project area is seral and subject to disturbance. We continue to believe that our past experience with treating aspen (when adequately protected) indicates a low degree of uncertainty in terms of impacts to aspen. The no action alternative addresses your concern and the vegetation analysis will compare and contrast impacts to aspen.

Comment 33-17: Question exists as to whether removing conifers from some aspen patches will preclude future severe or mixed severity fire and thus disrupt the natural disturbance ecology and future regeneration of aspen. The stakeholders' Large Tree Retention Strategy mentions these uncertainties. More information and collaboration is needed refine appropriate treatments for various conditions in which aspen occurs throughout the project area. The Forest Service should use the NEPA process to facilitate that collaboration and information gathering. The result of that effort should include clear statements of scientific uncertainty, where such uncertainty exists, and clear statements describing management rationale in light of those uncertainties.

Response: See our response to comment 33-16.

Comment 33-18: The Forest Service should also analyze and disclose the direct, indirect and cumulative impacts of fire suppression, livestock, elk and deer browsing on aspen in the context of the EIS. Failing to identify and correct causes of aspen decline renders correcting the symptoms of decline a temporary fix.

Response: At the March 19, 2012 NEPA update public meeting, we shared our draft cumulative effects document and posted it on the 4FRI website (<http://www.fs.usda.gov>) in the planning document section.

Past actions such as ungulate grazing and fire suppression are considered and summarized for the purposes of setting the existing condition baseline for vegetation structure, pattern, composition, and vegetation diversity. This is consistent with the direction from CEQ found at 40 CFR 1508.7 and the agency's implementing regulations which state, "The analysis of cumulative effects begins with consideration of the direct and indirect effects on the environment that are expected or likely to result from the alternative proposals for agency action. Agencies then look for present effects of past actions that are, in the judgment of the agency, relevant and useful because they have a significant cause-and-effect relationship with the direct and indirect effects of the proposal for agency action and its alternatives. CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision-making (36 CFR 220.4 (f))."

Managed ungulate grazing is carried forward as ongoing action that is considered in cumulative effects. In the most simplest of terms, the existing condition is that aspen is in decline for multiple reasons. Past management actions and natural disturbances has occurred across the forests and contributed to the existing condition or baseline. Ongoing projects may continue to treat aspen. Ongoing management actions include managed grazing. There are future projects that include an aspen restoration component. This analysis will describe the relevant temporal and spatial boundary and consider how 4FRI actions (mechanical treatment in alts B, C, and D, prescribed fire in alts B and C, protective barriers in alts B, C, and D) may affect aspen when considered with ongoing and future projects that overlap in time and space.

Comment 33-19: (10) LIMITATIONS TO USING PRESETTLEMENT TREE EVIDENCES IN TREATMENT DESIGN While the presence of pre-settlement tree evidences indicates the location of pre-settlement trees, it is impossible to know whether the absence of such evidence indicates the absence of pre-settlement trees without site-specific historical measurements of pre-settlement or prelogging forest structure. Without historical data it is impossible to measure the accuracy evidence-based reconstructions at any particular site. Factors causing site-specific evidence loss since settlement may include (1) fire, (2) decay, (3) removal, (4) and destruction or removal during past logging or fire suppression operations. While there are a few cases that have facilitated a comparison between historical structural data and evidence-based reconstructions, those examples are few and small; their extrapolation across large areas defies common statistical standards of vegetation ecology.

Response: The vegetation report includes a section on the supporting science for the desired conditions. This section includes a heavily referenced narrative of historical conditions specific to the 4FRI Coconino NF and Kaibab NF project area. The referenced documents are considered the best available science in terms of reference conditions for this area. The desired conditions for canopy openings is guided by reference conditions specific to the ponderosa pine type within the project area and meeting the forest plan habitat specific standards and guidelines. Pre-settlement evidence would assist in the actual placement of openings and the shape and size of the openings. Using pre-settlement evidence (as one tool) would result in a range of tree group/opening patterns on the landscape. There may be areas on the landscape where evidences suggest that larger openings may have existed previously. We are bound by, and will not exceed, forest plan or forest plan amendment (in the case of savanna and grassland restoration treatments) guidance on opening size even if evidence suggests otherwise.

Comment 33-20: Translated into silvicultural prescriptions, these factors can lead to forests that are unnaturally open, less resilient and less dense than the natural heterogeneity of ponderosa pine forests—and this is before accounting for stochastic post-treatment mortality events. As described elsewhere in these comments, it's important for residual densities called for in silvicultural prescriptions to account for stochastic mortality that may result from future fire, climate and other factors. This concern is magnified when relying on pre-settlement tree evidences to manage for natural variability. For example, a pre-settlement model prescription in the Eager South project that replaced “missing” evidences with postsettlement[...]trees at a 1:1 replacement rate did not withstand fire effects from the Wallow Fire (Figure 1). Mortality was extensive throughout the treatment unit. Residual forest density following treatment may have been less than natural variability; it is surely so following the Wallow Fire. Figure 1. Tree-mortality in pre-settlement prescription following the Wallow Fire yields live-tree densities far below the natural variability of the site. Similar results have occurred with the use of the pre-settlement model near Mt. Trumbull in northern Arizona. Here, prescribed fire effects resulted in tree mortality unanticipated by the thinning prescription, and residual tree densities far below restoration goals (Figure 2). Even in this case, there was no baseline historical data with which to verify tree evidence reconstructions upon which prescriptions were based. Residual tree densities may well be less than natural variability in this case too; that is impossible to know. Figure 2. Unanticipated tree mortality and cheatgrass invasion following pre-settlement prescription at Mt. Trumbull. Allen et al. (2002) describe the following cautions against relying on pre-settlement tree evidences:

Response: See our response to comment 33-19.

Comment 33-21: The most substantial scientific work to address the need for restoration of Southwestern ponderosa pine forests and to determine the ecosystem effects of treatments has been made by Covington and co-workers at the Ecological Restoration Institute of Northern Arizona University (Kaye and Hart 1998; W. W. Covington, A. Waltz, P. Fule', and G. Verkamp, unpublished report to U.S. Bureau of Land Management, Arizona Strip District). Their efforts have focused on attempts to reconstruct and reestablish specific stand reference conditions that existed just prior to the date of cessation of the natural fire regime (Moore et al. 1999). The goal has been to replicate tree densities and spatial patterns as accurately as possible for sites where presettlement stand structures have been reconstructed. Conceptually, this approach takes a broad view of “reference conditions,” and incorporates the restoration of surface fire as a key process. However, there are some ecological issues concerning on-the-ground implementation of this approach. The choice of a specific moment in time as the initial restoration target—for example the date of the last widespread fire in the late 1800s (Moore et al. 1999)—is potentially

problematic. Any particular moment is unique in the long-term history of an ecosystem, and forests often exist in disequilibrium with current climate to some degree (Millar and Woolfenden 1999). Moreover, an increasing body of evidence indicates that late 20th century and current climate is unprecedented on a time scale of at least 1000 yr (Mann et al. 1998, Crowley 2000). Restoration of structural characteristics of a forest back to the date of the last widespread fire in the late 19th century implies that tree recruitment processes of the 20th century were entirely unnatural. In fact, postsettlement tree regeneration pulses would have contributed important structural elements to contemporary forests, even if tree-thinning surface fires had continued. It is difficult to estimate what proportion of these cohorts, much less which individual trees, would have survived to maturity (Mast et al. 1999). It may be unwise to automatically choose a century-old date as a regional target condition for current forests, as the replication of plant densities and spatial arrangements that existed at any particular date in the past may compromise ecosystem resilience in future decades and centuries. For example, this structure-oriented approach can result in the aggressive removal of too many trees during the initial entry, which may seriously constrain ecosystem response and management options. Given their relatively slow growth rates, existing trees represent a form of biological capital that should be conserved. Multiple, incremental treatments, using combinations of fire and thinning, may be more conservative and ecologically justifiable than the immediate restoration of a particular structural element, such as the ca. 1880 spatial distribution of overstory tree stems. Given the great heterogeneity of Southwestern ponderosa pine forests, local data on fire history and presettlement stand structures are required to implement this precise structural restoration approach. Collecting such data is expensive and requires the persistence of presettlement forest “evidences” (Fule et al. 1997), which have been lost in some locations due to logging, harvesting of fuelwood, fire, or decay. As a result, it is not practical, cost effective, or in some cases even possible to reconstruct detailed structural reference conditions for every restoration project area. Moreover, some important data (such as density and spatial distribution of small trees) cannot be reconstructed from remnant historical evidence. A structure-oriented approach to forest restoration is being proposed for wide implementation in the Southwest because of its methodological clarity, grounding in quantifiable conditions, and scientific and political support (Covington et al. 1997, Moore et al. 1999, Jenkins 2001). We consider historic structure to be one ecologically valid reference criterion for forest restoration. There are, however, theoretical and practical concerns over regional application of a structure-oriented approach (see Morgan et al. [1994], Kaufmann et al. [1994], Landres et al. [1999], Wagner et al. [2000], and Southwest Forest Alliance [2001] for reviews and discussions). We contend that a broader conceptual basis, as outlined in this paper, provides a more comprehensive framework, and one that reflects the diverse ecological conditions that exist in Southwestern forests. [...] We agree with Covington (2000:136) that there is no “one size fits all” approach to restoring the ecological integrity of ponderosa pine forests.” A diversity of restoration approaches should be applied in the Southwest. [...] Allen et. al. (2002) at 1428, 1429

Response: Thank you for your comment. Please see our response to comment 33-19.

Comment 33-22: The EIS should explicitly acknowledge and discuss all of the afore-mentioned limitations. The EIS should clarify that, as a result, relying on evidences as an absolute basis for determining residual tree density targets is imprudent and is likely to underestimate the natural variability of forest structure. The EIS should acknowledge that a broader range of ecological attributes than just stem density--such as canopy cover and fire regimes, should be employed in describing natural variability. The EIS should acknowledge that temporal scope of “reference conditions” used to describe natural variability includes more than a snapshot in time from 1880,

but instead includes a longer time frame in which the dynamics that lead to a range of changing ecological conditions occur over time. Because the Ecological Restoration Institute advocates for using pre-settlement tree evidences as an absolute basis for determining post-treatment tree densities, the EIS should also identify portions of the EIS that address these issues that staff from the Ecological Restoration Institute have written, reviewed or edited in a capacity beyond that of the public participating in the NEPA process. Lastly, the ongoing scientific uncertainty and controversy that attends the use of pre-settlement tree evidences in the development of thinning prescriptions warrants that the Forest Service engage stakeholders in the collaborative development of restoration prescriptions. The Forest Service has thus far explicitly excluded thinning prescriptions from the scope of the collaborative engagement with 4FRI stakeholders; building agreement on prescriptions is both consistent with the letter of the 4FRI – FS MOU and a necessary step in the process of translating collaborative agreement into on-the-ground restoration.

Response: Thank you for your comment, please see our response to comment 33-19. Regarding the scientific uncertainty and controversy, this is largely negated by the fact that we do not intend to solely use the evidence-based approach to lay out groups and openings.

Comment 33-23: The Forest Service must adequately consider the cumulative impacts of all past, present and reasonably foreseeable projects within and near the project area.

Response: Please see our response to comment 33-18.

Comment 33-24: 40 C.F.R. § 1508.27(b)(7); see also id. § 1508.7 (“Cumulative impact” defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future action,” and recognizing that cumulative actions “can result from individually minor but collectively significant actions taking place over a period of time.”); id. § 1508.25(a)(2) (in considering the proper scope for analysis, the Forest Service must consider “cumulative actions,” which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same analysis). There is a substantial body of scientific literature that identifies livestock grazing as a major factor in the alteration of historic fire regimes and a contributor to fire hazard (Arnold 1950, Cooper 1960, Madany and West 1983, Mitchell and Freeman 1993, Rummell 1951, Savage and Swetnam 1994). This is true for five reasons. First, livestock grazing removes the grasses that compete with tree seedlings for water and nutrients. This favors the establishment of deep rooted trees and allows them to dominate affected sites. Studies of ungrazed sites in several ponderosa pine dominated ecosystems found that in the absence of livestock grazing, and in the absence of fire, open ponderosa pine forests with a minimum of understory pine seedling establishment was documented (Madany and West 1983, Rummell 1951). Second, most tree species require bare soil for successful germination and, grazing that removes the grassy understory and creates bare disturbed soil conditions that favors tree establishment. This has led to excessive tree-stocking density in many locations (Belsky and Blumenthal 1997). Third, grazing removes fine fuels such as grasses that otherwise may help to carry the light intensity fires that once burned at regular intervals in the planning area. This has permitted young saplings and trees to become established and be recruited into the forest stand (Arnold 1950, Savage and Swetnam 1994). Fourth, by permitting a large number of small saplings to become established, competition for water among existing living trees is increased making trees more vulnerable to insects and other pathogens (Hessburg et al 1994). Under extreme drought such trees are actually more flammable than a dead tree since internal water content is often less than kiln-dried lumber. Flammable resins found in

living, drought-stressed trees may explode into flames upon contact with fire. Fifth, by contributing to the spread and persistence of easily ignited weedy species like cheatgrass, livestock production has created far more acres of highly flammable plant communities (Belsky and Gelbard 2000)

Response: Please see our response to comment 33-18.

Comment 33-25: 12) INVASIVE PLANTS Domestic livestock, as well as logging, prescribed fire, and other practices that disturb soils, spread alien weedy species in ponderosa forests (Johnson et al. 1994). Livestock act as vectors for seed travel, disturb the soil, and reduce the competitive and reproductive capacities of native species. Exotic weeds can displace native species, in part, because native grasses are not adapted to frequent and close grazing (Mack and Thompson 1982, Belsky and Blumenthal 1997)

Response: General information, specific response not needed.

Comment 33-26: In some portions of the planning area, although the locations relative to active grazing allotments is not disclosed, aggressive alien weeds such as cheatgrass (*Bromus tectorum*) and spotted knapweed (*Centaurea maculosa*) have displaced native species. EA at 164. The potential for significant cumulative impacts of noxious weed spread in the project area is high because McGlone and others (2009) showed that cheatgrass abundance and distribution increased 90-fold above a pre-treatment baseline as a result of forest treatments similar to the proposed action (Figure 3).

Response: Please see our response to comment 33-27.

Comment 33-27: Figure 3. Cheatgrass invasion following pre-settlement model thinning is ubiquitous near Mt. Trumbull. The presence of cheatgrass has important long-term implications for native plant communities. Melgoza and co-workers (1990) studied cheatgrass soil resource acquisition after fire and note its competitive success owing to its ability suppress the water uptake and productivity of native species for extended periods of time. They further note that cheatgrass dominance is enhanced by its high tolerance to grazing (also see Mack 1981). Cheatgrass is well adapted to fire and often dominates plant communities after disturbance (Young et al. 1969). Its annual life-form coupled with the abilities to germinate readily over a wide range of moisture and temperature conditions, to quickly establish an extensive root system, and to grow early in the spring contribute to its successful colonization (Melgoza et al. 1990). Some native species also exhibit this trait, but greenhouse and field studies show that cheatgrass effectively competes with seedlings of perennial species (Hull 1963, Harris 1967, Evans et al. 1970, Harris and Wilson 1970). In addition, Melgoza and others (1990) show that cheatgrass successfully competes with the native species that survive fire, despite these plants being well-established adult individuals able to reach deeper levels in the soil. This competitive ability of cheatgrass contributes to its post-fire dominance.

Response: Occurrences of cheatgrass within the 4FRI project areas are not well documented. Areas likely to contain cheatgrass infestations include severely disturbed areas such as recent wildfires. Alternatives B and C would restore the structure and processes of the ponderosa pine forests. Alternative D would address structure but would not restore fire as a natural process throughout the project area. All action alternatives would reduce the risk of uncharacteristic wildfires such as the recent Schultz Fire (2010).

We recognize the significance of cheatgrass invasions and their effects to ecosystem functions and processes, especially the effects on fire frequency and areal extent. The forests completed the Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds (Weeds FEIS) in 2005. This document, which was incorporated into the forest plans as amendments, provides the guidance for treatment noxious or invasive weeds on the Coconino, Kaibab, and Prescott NFs. At the time of completion, the extent of cheatgrass infestations and their distributions on the forests was unknown. The Weeds FEIS provided for treatment of cheatgrass in certain areas, focusing mainly on some severe infestations on the North Kaibab Ranger District, Kaibab NF. The cheatgrass occurred in the habitat of a rare plant of concern on the forest. At the time of the preparation of the Weeds FEIS, most scientific studies on cheatgrass focused on grassland and shrub land habitats. Recent studies such as those by McGlone and his co-authors will provide valuable insight into the effects of cheatgrass in forested ecosystems. McGlone and others (2009) prepared two articles on cheatgrass invasion after restoration treatments at Mount Trumbull, AZ. In one article, published in *Ecological Restoration* titled “*Cheatgrass Encroachment on a Ponderosa Pine Forest Ecological Restoration Project in Northern Arizona,*” the cheatgrass invasion was documented in 2003, several years after the initial treatment in some units of the study. McGlone and his co-authors cite weather as a contributing factor to cheatgrass invasion. The areas referenced in his study experienced a severe drought in 2002, displacing most plants including cheatgrass. Then the area received above average precipitation in September 2002. Since cheatgrass is a winter annual, the cycle was conducive to cheatgrass germination. During that time, significant increases were seen in cheatgrass cover in all treatments including the control (no treatment area). A similar weather cycle was observed in many parts of the western U.S. during that time, including the Flagstaff area.

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

In a review article by McGlone and Egan (2009), titled “*Role of Fire in the Establishment and Spread of Nonnative Plants*”, the authors review wildfires and prescribed fire in ponderosa pine forests in northern Arizona. In this review they discuss the same restoration treatment area as in the articles above. They mention the cheatgrass invasion but go on to state “Fuel loads at the time of burn were heavy, often resulting in high-severity fires. While many factors were involved in the spread of cheatgrass across the landscape, nonnative invasion on this site was higher than others of similar design”. Therefore, while your point on cheat grass is duly noted, the basis of the comparison may be overstated.

One of the objectives of the 4FRI restoration effort is to encourage industry to promote utilization of biomass from the treated areas. This would likely reduce the fuel loading in the treated areas and would be substantially lower than on the Mount Trumbull area. Therefore, fire severity in treated areas would be reduced and the risk of cheatgrass infestations may be reduced as well. One of the factors influencing weed populations in general is introductions into new areas. The Weeds FEIS provides mitigations to reduce the risks of new introductions such as vehicle

cleaning and the use of certified weed free products. Additionally (as mentioned previously), the Coconino NF and Kaibab NF Forest Plans have incorporated the direction of the Weeds FEIS, requiring noxious or invasive weeds to be considered in analysis of project design and implementation. Design features and mitigation that has been developed to address noxious weeds includes (but is not limited to): (1) Survey roads to be closed or obliterated before the work begins and avoid Southwest Region sensitive plants if necessary. Avoid existing noxious or invasive weeds during soil disturbing activities associated with obliteration, (2) Place slash piles on previously used locations such as old piling sites, old log deck sites, or other disturbed sites to avoid severe disturbance to additional locations where possible, (3) Treat weed infestations within stands before implementing treatments, (4) Prevent spread of potential and existing noxious or invasive weeds by vehicles used in management activities by washing vehicles and equipment prior to entering the project area and when moving from one area to another, (5) Incorporate the Best Management Practices for noxious or invasive weeds as listed in Appendix B of the Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds into all management actions, (6) Manage prescribed fires as an aid to control of existing weed infestations and to prevent the spread of existing weeds, and (7) Incorporate weed prevention and control into project layout, design, alternative evaluation, and project decisions.

Regarding knapweed, the botany report notes there are three known sites of diffuse knapweed within the project area. Knapweeds are early seral species and can be expected to expand in areas of disturbance. For this reason, treatments such as tree removal and burning are likely to provide conditions conducive to establishment and spread of these species in areas where they exist. Mitigation, which has been incorporated into all action alternatives, is especially important in order to prevent the threat of spread from infested areas to those areas not currently infested because of invasive nature. Although the mitigation was originally designed for diffuse knapweed, the 4FRI botanist has confirmed it would be the same for spotted knapweed.

In addition to those species that the forests must address, we included several species because of concern expressed by 4FRI stakeholders. The stakeholder developed a watch list for weed species. These species are currently not known to fall within the areas slated for treatment in this analysis. However, if they are detected, aggressive eradication efforts would be a top priority and applied quickly. Mitigations for these species include best management practices (BMPs) such as vehicle washing to assure they are not introduced into the project area. These species include Malta starthistle (*Centaurea melitensis*), yellow starthistle (*Centaurea solstitialis*), Russian olive (*Eleagnus angustifolia*), Himalayan blackberry (*Rubus procerus*), giant reed (*Arundo donax*), sulfur cinquefoil (*Potentilla recta*), tree of heaven (*Ailanthus altissima*), Siberian elm (*Ulmus pumila*), halogeton (*Halogeton glomeratus*), dyer's woad (*Isatis tinctoria*), Eurasian water-milfoil (*Myriophyllum spicatum*), oxeye daisy (*Leucanthemum vulgare*), Canada thistle (*Cirsium arvense*), and common teasel (*Dipsacus sylvestris*). The discussion of effects on these species is limited to indirect effects since no direct effects are anticipated.

References used in this response include:

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

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

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

Comment 33-28: (13) THREATENED AND ENDANGERED SPECIES Section 7 of the Endangered Species Act (“ESA”) requires the Forest Service, in consultation with the U.S. Fish and Wildlife Service (“FWS”), to insure that any action authorized, funded, or carried out by the agency is not likely to (1) jeopardize the continued existence of any threatened or endangered species or (2) result in the destruction or adverse modification of the critical habitat of such species. . . . Because the Forest Service is in ongoing violation of the 2005 programmatic biological opinion’s terms and conditions for the Mexican spotted owl, among other species, any take of these species – incidental or otherwise – is no longer covered by the programmatic biological opinion and would be in violation of Section 9 of the ESA. See 16 U.S.C. 1536(o)(2); 16 U.S.C. 1538. Therefore, until the Forest Service has completed its reinitiated consultation with the U.S. Fish and Wildlife Service regarding impacts of implementing Land and Resource Management Plans in the region on Mexican spotted owls and other species, any projects implementing those Plans, including the Proposed Action, must avoid take of Mexican spotted owl to avoid violating Section 7(d) and 9 of the ESA. 16 U.S.C. § 1538(a)(1); 16 U.S.C. 1536(d); 50 C.F.R. § 17.31(a).

Response: We have been working closely with the U.S. Fish and Wildlife Service (USFWS) to design the treatments in MSO and northern leopard frog habitats. The 11 forest biological opinion (BO) is now complete for the Coconino and Kaibab NF (USDI FWS 2012a-b) and was finalized prior to the onset of formal consultation for this project.

Comment 33-29: FOREST PLAN AMENDMENTS The Forest Service proposes four forest plan amendments as part of the proposed action. Notably, these amendments do not arise from collaboration with 4FRI collaborators, but were additions to the proposed action resulting from internal Forest Service process. The Forest Service claims all four of these amendments are non-significant.

Response: We respectfully disagree that collaborators were not informed that plan amendments were needed. Throughout the public involvement process we indicated there was likely a need for plan amendments. As early as the January 20, 2011 public meeting, the information that we showed via PowerPoint stated, “The draft proposed action is designed to comply with Coconino and Kaibab forest plan standards and guidelines, as amended. Whether minor forest plan amendments are needed will be determined as the analysis progresses. However, no significant forest plan amendments are anticipated”. At the June 6, 2011 public meeting we provided our initial response to comments. The focus of this meeting was to: (1) review comments and our responses, (2) review the crosswalk conducted between the LTRS and desired conditions to the purpose and need and emerging (revised) proposed action, and (3) review the scales of analysis (which was regarded as a plan amendment for the Coconino NF). In this initial response to comments (June, 2011), at least 3 responses (comment 53-2, 53-4, and 53-9) discussed and/or listed the draft forest plan amendments. As required, the draft proposed plan amendments were part of the August, 2011 revised proposed action. We have had many discussions with stakeholders on the challenges associated with conducting landscape restoration using dated land

management direction that originally focused on even-aged management. The draft plan amendments will be shared prior to the release of the DEIS.

Comment 33-30: We discuss each of the four amendments below. The criteria for determining non significance are: Timing. Identify when the change is to take place. Determine whether the change is necessary during or after the plan period (the first decade) or whether the change is to take place after the next scheduled revision of the forest plan. In most cases, the later the change, the less likely it is to be significant for the current forest plan. If the change is to take place outside the plan period, forest plan amendment is not required. Location and Size. Determine the location and size of the area involved in the change. Define the relationship of the affected area to the overall planning area. In most cases, the smaller the area affected, the less likely the change is to be a significant change in the forest plan. Goals, Objectives, and Outputs. Determine whether the change alters long-term relationships between the levels of goods and services projected by the forest plan. Consider whether an increase in one type of output would trigger an increase or decrease in another. Determine whether there is a demand for goods or services not discussed in the forest plan. In most cases, changes in outputs are not likely to be a significant change in the forest plan unless the change would forego the opportunity to achieve an output in later years. Management Prescription. Determine whether the change in a management prescription is only for a specific situation or whether it would apply to future decisions throughout the planning area. Determine whether or not the change alters the desired future condition of the land and resources or the anticipated goods and services to be produced. FSH 19089.12. If the amendment is determined not to be a significant change to the forest plan, the Forest Supervisor may implement the amendment following appropriate public notification and satisfactory compliance with Forest Service environmental policies and procedures for the project or action. If the change to the forest plan is determined to be significant, the Forest Service must follow the required 10 step planning process found at 36 CFR 219.12. In this case, the preparation of an environmental impact statement (EIS) is mandatory (16 U.S.C. 1604(f)(4), 36 CFR 219.10(f), and 36 CFR 219.12).

Response: The comment provides general and informative information. No specific response is required.

Comment 33-31: A. “VEGETATION AND PRESCRIBED FIRE TREATMENTS WITHIN MEXICAN SPOTTED OWL PACS” (COCONINO NATIONAL FOREST) The Forest Service proposes to amend the Forest Plan for the Coconino National Forest to allow for more logging more and larger trees in MSO PACs than is currently allowed because: There is a need to enhance nesting, roosting and foraging habitat while reducing the risk of crown fire and high intensity surface fire in at least 18 PACs. There is a need to increase overall tree health, promote the development of larger diameter trees, improve health and longevity of existing old trees, promote faster development of old growth forest structure, improve owl forage and nesting habitat, and reduce the potential effects of wildfire within these PACs. If the harvesting of trees is limited to 9 inch DBH, an insufficient number of pines would be removed. This would result in no measurable improvements to forest health, growth, and vigor, owl habitat, fire regime condition class, or reduction in fire hazard within the 18 PACs. The Forest Service fails to justify the proposed amendment. The Forest Service provides no data demonstrating that existing forest plan guidance is inadequate to abate fire hazard in those PACs. Importantly, the Recovery Plan for the MSO and Forest Plans set forth a strategy for mitigating fire hazard without jeopardizing habitat attributes. The Forest Service fails to provide a detailed, numerical explanation of how management recommendations the existing Recovery Plan and Forest Plan fail to provide for habitat requirements of MSO within said PACs. The Forest Service fails to explain how “forest

health,” “growth,” “vigor,” or “fire regime condition class” are relevant to MSO recovery or habitat use. The proposed action lacks discussion of scientific literature demonstrating that MSO and CSO) will continue to use burned habitat, and it fails to include any discussion of the relative impacts associated with the duration and magnitude of disturbance to owls that would accompany mechanical treatments versus those that would result

Response: We agree that additional information was needed on why deviation from current MSO plan direction was needed. Since the revised proposed action was released for comment, we have worked closely with USFWS to design treatments that would improve habitat structure as well as reduce fire risk in PACs that are most at-risk. Our management recommendations are a result of using a variety of databases to review each individual PAC, field visits to many of the PACs proposed for treatment, and modeling individual stands within the PACs to develop our management prescriptions. This additional analysis has resulted in several draft Coconino NF Forest Plan amendment proposals for MSO. We included the latest information on the number and title of plan amendments in the draft issues and alternatives document that was shared at the March 19, 2012 NEPA update meeting. That draft working document was also posted on the 4FRI website (<http://www.fs.usda.gov/4fri>). We look forward to reviewing all of the draft plan amendments at an upcoming NEPA update public meeting.

Comment 33-32 The Forest Service’s inability to demonstrate that there is a need to go beyond the severity of treatments allowed by the current Recovery Plan and Forest Plan stems in large part to it and the U.S. Fish and Wildlife Service’s failure to implement monitoring and adaptive management in relationship to those plans’ implementation, as has been required by law for 15 years. That lack of monitoring perpetuates scientific uncertainties relating to owl population trends and relationships between habitat attributes, management actions and owl populations. Ganey et al. (2011) explain: Many of the recommendations in USDI FWS (1995) were never implemented. As a result, we still have no rigorous estimates of trends in owl populations or habitat, nor have we evaluated the effects of common land-management activities on owls or their prey and habitat. For the most part, land managers have chosen to manage around owl habitat (Beier and Maschinski 2003). This generally is consistent with the short-term protection of owl habitat called for in USDI FWS (1995) but has not advanced the goal of developing knowledge that could be used to move beyond that short-term strategy. Thus, the uncertainties that limited our ability to devise a long-term, landscape-dynamics-based management strategy for Mexican spotted owls remain and will continue to remain until we proactively address some of the major information gaps identified. Ganey et al. (2011) at 80.

Response: Thank you for your comment.

Comment 33-33: Short of filling those information gaps, which certainly has not occurred in the proposed action, the prudent approach to management of MSO PACs continues to be short term protection of MSO habitat by either avoiding PACs and treating upwind of them, or adhering to management recommendations set forth in the current recovery plan. The effects of more severe treatments, as the proposed action would seeks, are unknown, and could well contribute to the decline rather than recovery of MSO.

Response: See our response to comment 33-31.

Comment 33-34: The Forest Service has no data to demonstrate that wouldn’t be the case. The proposed amendment is significant because (1) it affects a large number (18) and acreage of MSO

PACs, (2) it changes the desired condition of those PACs outside the bounds of management recommendations set forth in the Recovery Plan, the Coconino National Forest Plan, and biological opinions approving both plans, (3) the duration of the proposed change would be ongoing for the subject PACs, and implementation of corresponding treatments is likely take upwards of a decade. For these reasons, the proposed amendment is significant and the Forest Service must follow the required 10 step planning process found at 36 CFR 219.12. In this case, the preparation of an environmental impact statement (EIS) is mandatory (16 U.S.C. 1604(f) (4), 36 CFR 219.10(f), and 36 CFR 219.12).

Response: Alternatives B, C, and D would treat select acres from 18 specific PACs above 9-inch dbh. The Coconino NF forest plan allows for treatments that include fuelwood and fire risk abatement outside of the 100-acre core area up to 9-inch dbh. The 9-inch dbh limit was not derived from ecological considerations, but was based on commercial value because the 9-inch dbh limitation effectively prevented commercial harvest within PACs, which was a concern in the early 1990s (Noble, personal communication 2011).

In 2011, biologists from the Coconino and Kaibab NFs, the 4FRI team, and the USFWS worked together to review individual PACs within the project area. PAC reviews included an evaluation of past survey results, existing forest conditions, past management activities, current management planning outside the 4FRI project area, administrative status (e.g. wilderness or general forest status), and on-the-ground familiarity with the sites. Landscape databases and remote imagery, including aerial photography, were reviewed spatially. The evaluation process was based on whether the proposed silvicultural treatments would move existing spotted owl habitat towards the desired conditions described in the 1995 recovery plan. Of all PACs reviewed in the western portion of the Upper Gila Mountain Recovery Unit (inside and outside the project area): 18 PACs were recommended for potential mechanical treatment; 32 PACs would be treated in other NEPA analyses; 20 PACs were not suitable for 4FRI objectives (e.g. PAC occurs in canyon or mixed conifer habitat, is within designated wilderness, etc.); 10 PACs had recent fire that had altered habitat; 11 PACs had existing habitat that did not require improvement; and 24 PACs were in adequate condition due to vegetation treatments outside the PACs. Information was lacking to make a determination in 2 PACs.

Eleven of the 18 PACs identified for treatment were reviewed in the field by biologists from the USFWS and Forest Service from May 6, 2011 to June 28, 2011. Field reviews included hiking much of the PAC and evaluating forest conditions stand-by-stand. Specialists from silviculture and fire participated in several of the reviews. The remaining seven PACs were evaluated using Forest Service and USFWS on-the-ground familiarity with the PACs (in addition to methods noted above). Each stand within the 18 PACs was modeled to identify treatments that would yield the best existing and future MSO habitat conditions.

We believe we are consistent with the management direction in the current MSO recovery plan and the draft recovery plan (USDI FWS 2011). The current recovery plan (USDI FWS 1995) states “Two primary reasons were cited for the listing: historical alteration of its habitat as the result of timber management practices, specifically the use of even-aged silviculture...” and “The danger of catastrophic wildfire...” While the Recovery Plan is clear that the primary existing threat is high-severity wildland fire, the Recovery Plan also states that “[r]etaining large trees is desirable because they are impossible to replace quickly and because they are common features of nesting and roosting habitats for the owl.” The recovery plan recognizes that “ecosystems are temporally dynamic [and] provisions are needed to ensure owl habitat in the long term.” The

primary objective to be achieved by the recovery plan guidelines is protection of the best available habitat for the MSO, while maintaining sufficient flexibility for land managers to abate high fire risks and to improve habitat conditions for the owl and its prey (p. 89). The potential for using silviculture as a tool for meeting objectives such as maintaining and developing MSO and enhancing various ecological factors is specifically identified in the recovery plan.

The recovery plan recommends that recovery efforts concentrate on the recovery units with the highest owl populations and significant existing threats. The project is located within the Upper Gila Mountain Recovery Unit (UGM RU). The UGM RU contains the largest known number of MSOs with approximately 55 percent of known spotted owl territories. The major land use within this recovery unit has been timber harvest.

The recovery plan describes a change in the size-class distribution of trees that occurred on commercial forest lands in Arizona and New Mexico between the 1960s and the 1980s. The density of large trees (greater than 19-inch dbh) decreased by 20 percent and sapling-sized trees (1 to 4.9-inch dbh) decreased in both absolute density and in relative contribution to the size-class distribution. Trees 5 to 12.9-inch dbh increased in density by 40 percent and in relative proportion of the size-class distribution and trees 13 to 19-inch dbh increased in density but not in the relative proportion of the tree distribution. The decrease in large trees was described as “an alarming negative trend with respect to a very critical component of spotted owl habitat” (p. 68) given that “the basis to maintain owl populations is to ensure that adequate habitat quality and quantity will be sustained through time.” In order to achieve this, the recovery plan advocates using coarse and fine filters for ecosystem management.

Coarse filters should be used “to maintain the natural array of conditions that exist with the biotic and physical limits of the landscape” while fine filters may be used “to provide specialized habitats or habitat elements within that overall landscape.” They recommend “innovative applications of uneven-aged management” for developing and maintaining important but difficult-to-replace spotted owl habitat elements, including large pine and oak trees and key habitat components, such as trees greater than 24-inch dbh and prey habitat. The proposed forest plan amendment allows for using silvicultural treatments in 18 PACs that are at risk of losing key MSO habitat elements through declining forest health. Treatment objectives in the 18 PACs are to develop and maintain adequate MSO habitat quality and quantity through time.

The need to evolve from managing solely for fuelwood collection and fire risk abatement is reflected in the Draft Revised Recovery Plan for the Mexican spotted owl (USDI FWS 2011). The draft revised recovery plan is being prepared for final release and is expected to be finalized before the 4FRI project is implemented. In it the USFWS states “Management is the most conservatively oriented toward owl management within PACs, but is by no means “hands off.” The draft recognizes situations exist where management is needed to sustain or enhance desired future conditions for the owl...” It goes on to state “Mechanical treatments to achieve these objectives require a landscape analysis to determine where the needs are greatest” which is the process we are currently undergoing.

In terms of affecting MSO habitat, approximately 59,223 acres of MSO PAC habitat occurs within the project area. In alternatives B, C, and D, the amendment would affect 7,656 acres or 13 percent of the habitat in the project area and approximately 7 percent of the total PAC habitat on the forest. Alternative B and D would treat 3,616 acres up to 9-inch dbh, 1,423 acres up to 12-inch dbh, 4,331 acres up to 14-inch dbh, and 1,902 acres up to 16-inch dbh. Alternative C would

treat 5,164 acres up to 9-inch dbh, 1,423 acres up to 12-inch dbh, 4,331 acres up to 14-inch dbh, 1,268 acres up to 16-inch dbh, and 634 acres up to 18-inch dbh. The amendment facilitates moving ponderosa pine towards the desired forest structure that enhances owl roosting and nesting habitat needs. Mechanical treatments above 9-inch dbh would facilitate the removal of ladder and canopy fuels which would reduce the fire risk in the 18 PACs. The amendment is consistent with forest plan goals for wildlife and fish of managing habitat to maintain viable populations of wildlife and fish species and improve habitat for selected species (Coconino NF forest plan, replacement page 22-1) and for improving habitat for listed threatened, endangered, or sensitive species of plants and animals and other species as they become threatened or endangered (Coconino NF forest plan, replacement page 23).

The mission, goals, and objectives for the forests are realized by applying groups of management activities to specific units of land. Groups of management activities are called prescriptions and the land units are called management areas (MA). Prescriptions are management practices selected and scheduled to apply to a specific area to attain multiple-use and other goals and objectives (36 CFR 219.3(u)). The amendment is consistent with goals and objectives by protecting conditions and structures used by spotted owls where they exist and to set other stands on a trajectory to grow into replacement nest habitat or to provide conditions for foraging and dispersal (USDI 1995).

The proposed forest plan amendment would be for treatments predominantly within MA 3 (ponderosa pine below 40 percent slopes) and MA 35 (Lake Mary Watershed). The proposed amendment intent is consistent with the management emphasis of providing for multiple uses that includes wildlife habitat and meeting MSO standards and guidelines, which emphasize improving and maintaining the quality of the habitat (MA 3) and moving ponderosa pine towards desired forest structure, including northern goshawk and MSO habitats (MA 35). MA 3 (511,015 acres) and MA 35 (62,536 acres) account for 573,933 total acres forest-wide. The proposed amendment would affect about 5,580 acres or 1 percent of MA 3 and about 1,821 acres or 3 percent of MA 35 total acres. Acres within other MAs total 222 acres. The amendment would not impose requirements on future management of the PACs as the amendment is site-specific to this analysis and addresses current conditions within the 18 PACs.

Outputs identified in the forest plan are associated with MBBF of sawtimber sales and products (meet demand for timber while reducing conflict with other resources), MBBF of firewood sold and free use (provide access to firewood), grazing capacity (MAUM) and permitted livestock use (MAUM). Due to the minimal acres affected, the amendment would not alter outputs on a forest-wide basis or change the long-term relationship between levels of goods (timber, firewood) and services.

The forest plan currently allows for treating up to 9-inch dbh within MSO PACs and alternative B and D would include treating up to 9-inch dbh on about 3,616 acres. The proposed amendment 1 would allow for improving habitat structure on an additional 7,656 acres. Relative to the forest's total suitable timber lands (626,326 acres), the amendment affects about 1 percent of those lands. For this reason, treatments within PACs do not measurably increase or decrease timber outputs or firewood availability. Treatment within PACs would not affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use.

Comment 33-35: The Forest Service proposes to amend Land and Resource Management Plans to allow for four rather than three scales of analysis. The proposed action does not demonstrate

how the current LRMPs preclude managing at four rather than three scales; thus, the proposed action does not demonstrate a need for the amendment. If the Forest Service carries this proposal into analysis, it should provide a detailed analysis of why this is needed and how it interacts with prevailing guidance for management of habitat for northern goshawk and its prey species.

Response: Thank you for your comment. The original intent of having a plan amendment was not for the purpose of using four scales (versus three scales) for the old growth and goshawk analysis. The purpose was tied to the Coconino NF forest plan direction related to conducting evaluations at the 10K scale, and the tie between the 10K scale and the EMA. Since August of 2011, we have had time to more thoroughly evaluate whether an amendment was needed. Given that the Coconino NF forest plan includes language that deviations from the 10K can be approved by the Forest Supervisor, we are preparing documentation for the project record that would describe the scales of analysis for this project that will be signed by the Forest Supervisor.

Comment 33-36: C. “POST-SAVANNA TREATMENT CANOPY COVER AND RESERVE TREES IN GOSHAWK FORAGING HABITAT” (COCONINO AND KAIBAB NATIONAL FORESTS) The Forest Service proposes to amend the Coconino and Kaibab National Forest Plans to eliminate minimum canopy cover requirements VSS 4, 5, and 6 stands and eliminate requirements for leaving 3 – 5 reserve trees within openings. The amendments would span 27,177 acres of ponderosa pine forest goshawk foraging habitat on the Coconino National Forest and 17,977 acres on the Kaibab National Forest. The Forest Service describes the need for this plan amendment as follows: Savanna treatments are designed to restore a reference condition based on historic characteristics consistent with a ponderosa pine “open” reference condition. The desired condition is to restore pre-settlement grass/forb interspaces and restore historic forest structure and pattern. Because interspaces would be based on pre-settlement evidence, meeting 40%+ canopy cover in each group (VSS 4 to VSS 6) cannot be guaranteed. Because interspaces would be based on pre-settlement evidence, meeting the reserve tree requirement cannot be guaranteed. While we are generally supportive of restoring pine savanna conditions, the discussion on savannas with stakeholders was cut short by tight timelines. We believe more science is needed to flesh out (1) where pine savannas existed historically, (2) the degree to which those were spatiotemporally fixed, and (3) treatments appropriate for restoring savannas in light of problems with the use of pre-settlement evidences. We believe a science peer review that goes beyond the current stakeholder group is warranted for methodologies employed for identifying savannas and for treatments restoring them. As we discuss earlier in these comments, while the presence of pre-settlement tree evidences indicates the location of pre-settlement trees, it is impossible to know whether the absence of such evidence indicates the absence of pre-settlement trees without site-specific historical measurements of pre-settlement or pre-logging forest structure. Without historical data it is impossible to measure the accuracy evidence-based reconstructions at any particular site. Factors causing site-specific evidence loss since settlement may include (1) fire, (2) decay, (3) removal, (4) and destruction or removal during past logging or fire suppression operations. While there are a few cases that have facilitated a comparison between historical structural data and evidence-based reconstructions, those examples are few and small; their extrapolation across large areas defies common statistical standards of vegetation ecology. Translated into silvicultural prescriptions, these factors can lead to forests that are unnaturally open, less resilient and less dense than the natural heterogeneity of ponderosa pine forests—and this is before accounting for stochastic post-treatment mortality events. Importantly, the actual language proposed for the proposed plan amendments does not restrict them to the intended 27,177 acres of ponderosa pine forest goshawk foraging habitat on the Coconino

National Forest and 17,977 acres on the Kaibab National Forest. Without that constraint, they apply to the entire forest. We believe this is an unintentional oversight on the Forest Service's part. The proposed amendment is significant because (1) it affects a large number of acres on both national forests, (2) it changes the desired condition, management direction and long-term management of those acres relative to what's currently set forth in both the Coconino National Forest and Kaibab National Forest Plans, (3) the duration of the proposed change would be ongoing; implementation of corresponding treatments is likely take upwards of a decade. For these reasons, the proposed amendment is significant and the Forest Service must follow the required 10 step planning process found at 36 CFR 219.12. In this case, the preparation of an environmental impact statement (EIS) is mandatory (16 U.S.C. 1604(f) (4), 36 CFR 219.10(f), and 36 CFR 219.12).

Response: Thank you for your comment. There are approximately 512,178 acres of ponderosa pine within the 4FRI project area. Of this total, 322,722 acres are within the Coconino NF. Approximately 198,136 acres (61 percent) of the forest acres (within the project area) have an open reference condition that corresponds to mollic-integrate soils. The association between an open reference condition and soils is supported by reference condition research. Structural characteristics widely reported for historical Southwest ponderosa pine are relatively open forests with trees typically aggregated in small groups within a grass/forb/shrub matrix (Cooper 1960, White 1985, Pearson 1950, Covington et al. 1997, Abella and Denton 2009). Recent work in northern Arizona has shown that tree densities across nine different ponderosa pine ecosystems depend to a large extent on soil type and climatic variables such as minimum spring and fall temperatures and May precipitation (Abella and Denton 2009). This work also showed that the degree to which trees were aggregated into groups was largely explained by ecosystem soil type. Twenty-eight to 74 percent of all trees were in groups, the remaining trees were scattered individuals (Abella and Denton 2009). These structural conditions were maintained by frequent, low-intensity surface fires that more often killed small rather than large trees (Dieterich 1980, Weaver 1951, Fiedler et al. 1996, Cooper 1960). On the Coconino NF, savanna treatments are proposed on 29,017 acres (updated figure since August, 2011 scoping) in alternatives B, C, and D.

Significance was evaluated against the criteria in Forest Service Manual (FSM) 1926.51 and 1926.52. Factors include timing, location and size, relationship to forest goals, objectives, outputs, and management prescriptions. In terms of timing, the Coconino NF forest plan has been in place (and amended) since 1987 and plan revision efforts are underway. Suitable goshawk habitat on the Coconino NF encompasses approximately 791,897 acres (Green 2011, unpublished data) and the project area is comprised of about 399,633 acres of goshawk habitat (non-PFA, PFA, dPFA, and nest stands). The amendment would affect approximately 4 percent of all suitable goshawk habitats on the forest and about 8 percent of goshawk habitat within the project area. For this reason, location and size was determined to be non-significant. The amendment would facilitate moving over 29,000 acres of ponderosa pine towards the desired forest structure (groups and clumps with herbaceous openings) that maximizes prey base species habitat and allows for the reintroduction of fire into the ecosystem.

The amendment is consistent with forest plan goals for wildlife and fish of managing habitat to maintain viable populations of wildlife and fish species and improve habitat for selected species (Coconino NF forest plan, replacement page 22-1) and for improving habitat for listed threatened, endangered, or sensitive species of plants and animals and other species as they become threatened or endangered (Coconino NF forest plan, replacement page 23).

The mission, goals, and objectives for the forest are realized by applying groups of management activities to specific units of land. Groups of management activities are called prescriptions and the land units are called management areas (MA). Prescriptions are management practices selected and scheduled to apply to a specific area to attain multiple-use and other goals and objectives (36 CFR 219.3(u)). The proposed amendment is predominantly within 19,010 acres of MA 3 (ponderosa pine below and above 40 percent slopes) and 5,840 acres of MA 35 (Lake Mary Watershed). The two management areas account for 573,551 total acres forest-wide. The proposed amendment would affect about 4 percent of MA 3 and MA 35 total acres. The amendment would not impose requirements on the future management of the 29,017 acres of goshawk non-PFA. The amendment is consistent with the management emphasis of providing for multiple uses that includes wildlife habitat (MA 3) and moving ponderosa pine towards desired forest structure, including northern goshawk habitats (MA 35).

Outputs identified in the current forest plan are associated with MBBF of sawtimber sales and products (meet demand for timber while reducing conflict with other resources), MBBF of firewood sold and free use (provide access to firewood), grazing capacity (MAUM) and permitted livestock use (MAUM). The amendment affects about 29,017 acres and the forest plan estimates there are 626,326 acres of suitable timber lands. In the short term (10-year period), the amendment affects about 4 percent of the suitable landbase. However, due to the minimal acres affected, the amendment would not measurably alter outputs in the foreseeable future on a forest-wide basis or change the long-term relationship between levels of goods (timber, firewood) and services. The amendment would not result in a change in land productivity; therefore, it would not affect timber suitability classification. Whether the 29,017 acres would continue to be managed as suitable timber in the long term will be evaluated during the forest plan revision process. The amendment would not affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use.

On the Kaibab NF 27,675 acres of savanna treatments are proposed in alternatives B, C, and D. Approximately 104,790 acres (55 percent) of the Kaibab NF's ponderosa pine within the project area has an open reference condition that corresponds to mollic-integrate soils. All savanna treatment acres would occur outside of goshawk PFA habitat. Treatments would affect approximately 7 percent of goshawk habitat in the project area (399,633 acres) and 5 percent of all suitable goshawk habitats on the Kaibab NF (541,000 acres). Design features associated with savanna treatments includes retaining all pre-settlement trees and the largest post-settlement trees (those that most closely resemble old trees in size and form as replacement trees) that are located adjacent to pre-settlement trees. The location of interspaces and reserve (leave) trees would be determined through the use of several tools including site quality, site productivity, and pre-settlement evidence. In terms of evaluating actions for significance, we used a similar process as outlined for the Coconino NF. In terms of timing, the Kaibab NF Land Management Plan has been in place (and amended) since 1988 and plan revision efforts are underway.

Suitable goshawk habitat on the Kaibab NF encompasses approximately 541,000 acres (Keckler 2011, unpublished data) and the project area is comprised of about 399,633 acres of goshawk habitat (non-PFA, PFA, dPFA, and nest stands). The amendment would affect approximately 5 percent of all suitable goshawk habitats on the forest and about 7 percent of goshawk habitat within the project area. For this reason, location and size was determined to be non-significant. The amendment would facilitate moving over 27,000 acres of ponderosa pine towards the desired forest structure (groups and clumps with herbaceous openings) that maximizes prey base species habitat and allows for the reintroduction of fire into the ecosystem.

The amendment is consistent with forest goals for wildlife and fish that promotes improving habitats through the development of habitat quality and diversity, the identification and protection of key habitats, and for improving habitats for listed threatened, endangered, or sensitive species of plants and animals and other species as they become threatened or endangered (Kaibab NF Land Management Plan, p.18).

Ponderosa pine savanna restoration is not new to the Kaibab NF. A review of past and current vegetation projects indicates this has been a common restorative practice since at least 1992 (Government Vegetation Treatment project, Williams District). Since 1992, other projects that have included savanna restoration on the Williams District include the 1995 Little Aso Habitat Diversity project, the 2002 Spring Valley WUI, the 2003 French Vegetation Project, the 2005 City Project, and the 2011 Community Tank Grassland Restoration project.

The mission, goals, and objectives for the forest are realized by applying groups of management activities to specific units of land. The land units on the Kaibab NF are geographic areas (GA) and land use zones (LUZ). Prescriptions are management practices selected and scheduled to apply to a specific area to attain multiple-use and other goals and objectives [36 CFR 219.3(u)]. On the Forest, amendment activities are within the following geographic areas (GAs): 26,831 acres is within GA 2 (Williams Forestland), 500 acres is within GA 3 (North Williams Woodland), and 301 acres is within GA 1 (Western Williams Woodland Geographic Area). Three acres are unaccounted for as they are incorrectly attributed to Camp Navajo. The proposed amendment would affect approximately 9 percent of GA 2 (of 308,394 total acres), less than 1 percent of GA 3 (of 65,533 acres total), and less than 1 percent GA 1 (of 169,041 total acres). The amendment would not impose requirements on future management of the 27,065 acres of goshawk non-PFA habitat as the amendment is site specific to the 4FRI analysis. The amendment is consistent with the management direction for wildlife and fish resources which directs the forest to ensure a moderate to high level of habitat diversity and capability (Kaibab NF Land Management Plan, pp. 50, 53)

Outputs identified in the current forest plan are associated with sawtimber and other product harvest levels (meet demand for timber while reducing conflict with other resources), commercial and personal-use fuelwood programs (MBF), grazing capacity (AUM), watershed (acres in unsatisfactory condition and water yield), developed recreation (management of public sites at the standard service level), developed and dispersed recreation outputs (RVD), and transportation (acres closed to off-road vehicle use), habitat diversity (change in habitat diversity index), old growth habitat (acres), and average annual wildlife and fish use (WFUD).

The amendment affects about 27,675 acres and the forest plan estimates there are 490,368 acres classified as tentatively suitable timberland. Therefore, the amendment affects about 6 percent of the suitable land base. Due to the minimal acres affected and the age of the forest plan, the amendment would not alter outputs in the foreseeable future on a forest-wide basis or change the long-term relationship between levels of goods (timber, commercial and personal use fuelwood) and services. Any predicted impacts/benefits to water yield are under analysis but expected to be minimal due to the acres being treated in the context of a 5th or 6th code watershed. The amendment would not result in a change of land productivity; therefore, it would not affect timber suitability classification. Whether the 27,675 acres would be suitable in the long term will be evaluated during the forest plan revision process. The amendment would not affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use.

Letter 34-20110901 – Marcus Selig, Grand Canyon Trust (Cara Letter #33)

Comment 34-1 (Cara 33-1): On August 19, 2011, the Kaibab and Coconino National Forests published in the Federal Register, at 76 Fed. Reg. 51936, a Notice of Intent (“NOI”) to prepare an Environmental Impact Statement (“EIS”) that proposes to conduct restoration activities across 600,000 acres of the Coconino and Kaibab National Forests (the “Project”). The August 19, 2011 NOI corrected an August 12, 2011 publication, which revised the original notice of intent and proposed action for the Project, published on January 25, 2011 at 76 Fed. Reg. 4279 (“Original Proposed Action”). The August 19, 2011 NOI included a brief description of the purpose and need for the Project and the proposed action for the Project. A more detailed description of the proposed action for the Project (the “Proposed Action”) was available on the Forest Service website (www.fs.usda.gov/4fri) and that document serves as the basis for these comments. The Grand Canyon Trust (“GCT” or the “Trust”) respectfully submits these comments on the Proposed Action and the scope of the analysis to be conducted in the Project’s (“EIS”). The Trust is a nonprofit organization that focuses on the protection and restoration of the Colorado Plateau – its spectacular landscapes, flowing rivers, clean air, diversity of plants and animals, and areas of beauty and solitude. Since 2009, the Trust has been an active member of the Four Forest Restoration Initiative Stakeholder Group (the “Stakeholder Group”) – a collaborative group of more than 30 organizations, municipalities, institutions, and agencies focused on carrying out landscape-scale forest restoration efforts across 2.4 million acres of ponderosa pine along the Mogollon Rim in Northern Arizona, including the Project area. Additionally, GCT staff and members regularly use and enjoy areas of the National Forests within the Project area.

Response: This comment provides introductory, general information. No response is needed.

Comment 34-2 (Cara 33-2): The Trust strongly supports the Forest Service’s desire to reestablish the resilience and function of northern Arizona’s ponderosa pine ecosystems and commends it on taking monumental steps towards achieving this goal. We believe it is vital that a more natural forest structure be restored to these ecosystems, thereby allowing for the reintroduction of fire into wildland forests in a way that is safe, socially acceptable, and protective of wildlife and native biological diversity. To be successful, GCT believes that restoration efforts must be ecologically, economically, and socially viable.

Response: Thank you for your comment. We agree with your statements.

Comment 34-3 (Cara 33-3): The Trust believes that this Proposed Action is a substantial improvement over the Original Proposed Action and provides a strong framework for accomplishing successful forest restoration efforts. The Trust still has certain concerns with the Proposed Action, however, and encourages the Forest Service to address these issues during completion of the Project’s EIS. Specifically, GCT believes that that the Forest Service must: (1) clarify the language of the Old-Tree Implementation Strategy in the preferred alternative of the EIS; (2) fully incorporate the Large Tree Implementation Strategy developed by the Stakeholder Group into the preferred alternative of the EIS; (3) ensure that mechanical thinning operations described in the preferred alternative create a forest structure that is in compliance with the canopy cover requirements of the Forest Plans; (4) work with the Trust and other interested stakeholders to develop a comprehensive sequencing strategy for treatment implementation; and (5) work with the Trust and other stakeholders to develop a comprehensive and robust adaptive management program.

Response: The points in this comment are addressed in the following responses.

Comment 34-4 (Cara 33-4): A. Old-Tree Implementation Strategy The Trust is pleased that the Proposed Action recognizes the “unique characteristics” and “essential structural features” provided by old growth forests and strives to limit the harvesting of old-growth trees. The Trust does not believe, however, that the Proposed Action’s restrictions against cutting old-growth trees are adequately explicit. The Trust believes it is essential that the preferred alternative in the EIS contain a very explicit and non-subjective restriction on the harvesting of presettlement, or old-growth, trees. GCT understands that rare exceptions to the restriction may need to be made to protect human health and safety and for limited operational purposes. We are concerned, however, with the following exception to the restriction against the cutting of old-growth trees, contained on page 59 of the Proposed Action: “Exceptions include removing trees that would pose a greater negative effect to the environment if they were not removed.” We believe that this exception is too subjective and could lead to the cutting of old growth trees for purposes of regeneration or the balancing of vegetative structural stages –practices that do not enjoy broad social support or the support of the Grand Canyon Trust. Therefore, the Trust suggests that this broad exception to the restriction on harvesting old-growth trees not be included in the preferred alternative of the Project’s EIS. Additionally, GCT is concerned with certain language contained in the Old-Tree Implementation Strategy. Specifically, the Trust requests that the Forest Service remove the broad and subjective exception to the Old-Tree Implementation Strategy that would allow for the cutting of old-growth trees to “prevent additional habitat degradation.” For the same reasons as stated above, the Trust suggests that this exception be deleted from the Old-Tree Implementation Strategy, which is a vital component of the preferred alternative of the Project EIS.

Response: Since the August, 2011 revised proposed action was made available for comment, we have had time to review and refine draft documents. In response to comments received on some of the introductory language in the implementation plan for the OTRS, the forest supervisors agreed to remove language that was perceived to be subjective or ambiguous. The OTRS applies to all action alternatives (B, C, and D) as design features and is integral to the implementation plan.

Comment 34-5 (Cara 33-5): B. Large-Tree Implementation Strategy: The Trust appreciates the Proposed Action’s recognition that a large-tree implementation strategy will need to be part of the Project’s final decision. The Trust is sorely disappointed, however, that such an implementation strategy, addressing one of the most socially contentious issues associated with forest restoration projects in the Southwest, was not part of the Proposed Action. As explained in the Proposed Action, the Stakeholder Group worked very hard to develop a large-tree implementation strategy that could accomplish the goals of the Project, while still enjoying broad social support. The Trust believes that the Forest Service’s failure to formally include this implementation strategy in the Proposed Action was a mistake that will cause the Project to lose significant support from the environmental community. The Trust strongly urges the Forest Service to not make this mistake again and fully incorporate the complete Stakeholder Group-developed large-tree implementation strategy into the preferred alternative of the Project’s EIS. The Stakeholder Group’s collaboratively developed large-tree implementation strategy reflects agreement between a diverse group of environmental conservation organizations, scientists, agencies, and industry representatives on the retention of large trees during the implementation of this Project. The document identifies the actions that should be taken to protect and retain large trees in almost every situation that would be encountered during the implementation of this Project. We believe

that complete incorporation of this document is vital to the Project's overall success and most strongly urge the Forest Service to do so.

Response: Since the August, 2011 revised proposed action was made available for comment, we have been further engaging the public and working through unresolved issues and points of debate with the proposed action, including the stakeholder-developed LTRS. To address emerging issues and clarify scoping comments, a meeting was held with commenters to discuss the conservation of large trees on October 14, 2011. At this meeting, it was clarified that what was most important was including the intent of the LTRS in the proposed action alternative.

The concern surrounding the conservation of large trees was identified as a key issue for this analysis. The issue statement reads: "The large tree retention strategy (LTRS) which was developed by the 4FRI stakeholders was not included in the proposed action. Large post-settlement trees, as defined by a socio-political process, are those greater than 16 inches in diameter-at-breast height (dbh)). The intention of the exception process within the LTRS was to increase landscape heterogeneity and conserve biodiversity. The LTRS represents social agreement between parties that greatly enhances the chance for landscape restoration to succeed and reduces the risk of conflict. If the LTRS is not incorporated, the current social support for landscape-scale restoration may be withdrawn. In addition, it may result in the removal of key ecosystem components that include nesting and roosting habitat and large woody debris that is important for wildlife".

In response to this issue, the vegetation analysis will evaluate how proposed treatments affect the VSS. The vegetation analysis on tree age and size class diversity will be used to inform the wildlife effects analysis. Alternatives B (proposed action alternative) and D do not incorporate the LTRS. However, alternative C responds to this issue by incorporating the key components of the LTRS while focusing on ecological desired conditions. It identifies circumstances where large, post-settlement trees may be removed to move towards or meet desired conditions. The intent of the LTRS has been incorporated into the alternative's design criteria, the monitoring and adaptive management plan, and the project implementation plan. The indicators used to evaluate this issue are: (1) a quantitative pre-treatment and post-treatment three-level analysis for MSO, goshawk, old growth, and VSS for goshawk and at the landscape scale (ponderosa pine vegetation type) to qualitatively gauge movement towards restoration desired conditions, and (2) a qualitative analysis of pre-treatment and post-treatment non-market social values that include large trees, public safety, and other biodiversity objectives that may conflict with protection of large trees.

At this time, the forest supervisors have not selected a preferred alternative. Section 1502.14(e) requires the section of the EIS on alternatives to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement . . ." This means that if the agency has a preferred alternative at the draft EIS stage, that alternative must be labeled or identified as such in the draft EIS. If the responsible federal official in fact has no preferred alternative at the draft EIS stage, a preferred alternative need not be identified there. By the time the final EIS is filed, Section 1502.14(e) presumes the existence of a preferred alternative and requires its identification in the final EIS "unless another law prohibits the expression of such a preference."

Comment 34-6 (Cara 33-6): C. Forest Plan Canopy Cover Requirements: The Trust is concerned that many of the thinning treatments described in the Proposed Action will not comply with the canopy cover requirements contained in the Coconino and Kaibab Forest Plans. Currently, the

Forest Plans require canopy cover within mid-age and older forests (VSS 4, 5, and 6) to be equal to or above 40 percent, as measured three different scales: the ecosystem management area level, the mid-scale such as drainage, and the small scale of site. The proposed treatments, however, may very well create forests with significantly less canopy cover, and if implemented in VSS 4, 5, and 6 stands, fail to comply with the Forest Plans and thereby violate the National Forest Management Act. To gain clarity regarding the effect of proposed treatments on canopy cover, the Grand Canyon Trust invested significant resources in developing canopy cover analyses. Our analyses confirm our concerns regarding the potential for noncompliance with the Forest Plans. We now urge the Forest Service to review our canopy cover analyses and work with us and other interested stakeholders to develop solutions that can ensure that the Project is implemented in a manner that achieves its overall goals and complies with Forest Plan requirements.

Response: Since the August, 2011 scoping period, we have continued to work on points of debate or disagreement with the proposed action, including the issue of canopy cover. On December 15, 2011, those people who had voiced a concern on canopy cover were asked to discuss canopy cover in relation to the forest plans' goshawk guidelines. The concern surrounding post-treatment canopy openness and resultant compliance with the forest plans was identified as a key issue for this analysis. The issue statement reads: "Measuring canopy cover in goshawk habitat at the group level will not meet forest plan stand-scale canopy requirements. A reduction in canopy and large tree densities have never been analyzed under NEPA and NFMA and could have deleterious effects to goshawk, its prey species, and those wildlife species that are dependent on that cover. Because natural openings would no longer be included within the VSS classification, it would result in significantly more lands being in an open condition or outside of the VSS 4 to 6 classifications. This could substantially increase the logging of mature and old trees and negatively affect wildlife, including goshawk and its prey species".

All action alternatives (B, C, and D) have been designed to manage (and measure) canopy cover in compliance with the forest plans. The analysis will describe how canopy cover will be met (and measured), address the inter-relationship between the canopy cover analysis to old and large trees, and disclose forest plan consistency. To address the need to add forest plan clarity for interspaces and the relationship between interspaces, openings, and VSS classes, a non-significant plan amendment has been developed for alternatives B, C, and D. To address post-treatment openness and canopy cover where the desired condition is to move towards an open ponderosa pine (savanna) reference condition, a non-significant forest plan amendment was developed for alternatives B, C, and D. The amendment would allow select acres on both forests to be managed for less than 40 percent canopy cover in VSS 4 to VSS 6 and less than 3 to 5 reserve trees per acre.

Comment 34-7 (Cara 33-7): D. Sequencing Treatment Implementation: The Trust appreciates the efforts put forth by the Forest Service to conduct the Proposed Action's Mechanical Treatment Prioritization Ranking. We believe that consideration of the factors used in this ranking process was crucial to identifying where mechanical treatments should be located across the Project area. We also believe, however, that it is ecologically, socially, and economically important to make well-informed decisions about when these treatments will be implemented. Therefore, we request that the Forest Service continue to collaborate with the Trust and other interested stakeholders, during and following their EIS analysis, to develop a comprehensive plan that identifies when specific stands, groups of stands, or Restoration Subunits should be treated. The Trust understands that development of a comprehensive treatment sequencing strategy will be a very complicated endeavor that involves numerous considerations, including the effect of treatment

sequencing on fire behavior, fire suppression, economic efficiencies, recreational uses, livestock management, and many others. By collaborating with interested stakeholders, however, the Forest Service will be able to bring additional resources to bear on it sequencing analyses, reducing its workload and enhancing its analysis by introducing a more complete spectrum of considerations.

Response: Please see our consolidated response to comment 34-8. The disclosure of sequencing within a NEPA document is problematic because it binds the agency to a fixed schedule that may not be able to be met due to weather, fires, markets, or other unforeseen circumstances.

Comment 34-8 (Cara 33-8): Although we understand that the Forest Service is not legally mandated under the National Environmental Policy Act (“NEPA”) to receive public input on project implementation efforts that are outside the NEPA process, we encourage the Forest Service to examine its continuing duty to collaborate throughout project planning and implementation, as set forth in the Collaborative Forest Landscape Restoration Program’s (“CFLRP’s”) enabling legislation and the Memorandum of Understanding between the Four Forest Restoration Initiative Collaborative Stakeholder Group Representatives and the U.S. Forest Service (“MOU”). Specifically, the CFLRP requires that CFLRP-funded projects, such as this Project, shall “be developed and implemented through a collaborative process that (A) includes multiple interested persons representing diverse interests; and (B)(i) is transparent and nonexclusive.” Omnibus Public Land Management Act of 2009, Pub. L. No. 111-11, § 4003(b)(2) (emphasis added). Furthermore, by signing the MOU in February 2011, the Forest Service agreed that the Forest Service and the Stakeholder Group would “work together at multiple stages prior to, during, and following the NEPA process to establish expectations for landscape-scale restoration.” MOU at 3 (emphasis added). We now request that the Forest Service continue to collaborate with the Grand Canyon Trust and other interested stakeholders during and following the NEPA process to develop a comprehensive treatment sequencing strategy and to address various other implementation obstacles.

Response: As we proceed forward with the environmental analysis (which will not address implementation sequencing), the operations component of 4FRI has been working with stakeholders in the spirit of implementing the requirements of the CFLR Act to develop a 10-year operational plan. We believe your concern is addressed where most appropriate – implementation and operations.

Comment 34-9 (Cara 33-9): The Trust appreciates the Proposed Action’s commitment to using an adaptive management strategy as a means of dealing with the uncertainty associated with initiating the Project across such a broad landscape over a long time period. Although flexibility to alter type, timing, intensity, and frequency of treatments are part of adaptive management, that flexibility must rely on (1) a rigorous monitoring framework, (2) clearly defined thresholds and that trigger particular changes in management actions, and (3) a NEPA framework that allows for management changes based on monitoring information. A rigorous and robust monitoring framework is critical for adaptive management to occur. The framework requires implementation monitoring to ensure that the desired conditions for forest structure and pattern are being met. The monitoring framework must also include effectiveness monitoring, which ensures that meeting the identified desired conditions for forest structure and pattern will result in achievement of the broader Project goals (as identified in the Landscape Strategy for the First Analysis Area). The Science and Monitoring Working Group of the Stakeholder Group are developing a monitoring strategy capable of addressing these broader Project goals. Although the Trust recognizes that limited resources may preclude the Forest Service from completing effectiveness monitoring on

its own, we recommend that the adaptive management strategy outlined in the preferred alternative of the EIS clearly identify how monitoring information collected by other agencies and stakeholders will be incorporated into the adaptive management decision process. Doing so will provide substantial leverage for acquiring the resources necessary for a more comprehensive and robust adaptive management program. Adaptive management also requires clearly defined, quantitative thresholds that trigger a management change if monitoring information indicates that those thresholds have been reached.

The Trust recommends that the adaptive management program included in the preferred alternative clearly identify how thresholds will be set prior to Project initiation, the timeframe for evaluating whether thresholds have been crossed, and the necessary management actions that must occur once the threshold has been crossed. In cases where the appropriate threshold is unclear, the Trust recommends that an initial threshold be identified and that the adaptive management program clearly identify a transparent process for evaluating and modifying thresholds as new information becomes available. The ability to inform and alter management based on monitoring information is the essence of adaptive management. In order to alter management, the Project's EIS must analyze a range of conditions within which the Forest Service expects to alter its treatments. The Trust appreciates that the desired conditions in the Proposed Action are stated as a range and that, on average, treatment results will fall within that range. Indeed, we encourage the Forest Service to evaluate the effects of a wider range of post-treatment conditions to allow for greater flexibility to alter desired condition ranges in the event of inaccurate initial assumptions. Importantly, however, we believe that the increased flexibility we recommend is only appropriate if the Forest Service has developed and is required to implement a comprehensive adaptive management strategy with a robust monitoring framework and clearly defined thresholds and triggers that explain when and how management will be altered. Adaptive management is critical to the success of the Project; however, there are few examples of successful adaptive management at these scales. The Trust would like to reiterate its commitment from the MOU to work together with the Forest Service "to develop, discuss, evaluate, and implement innovative landscape-scale planning, project preparation, treatment, science integration, monitoring, and adaptive management strategies. MOU at 4 (emphasis added). We sincerely hope that the Forest Service will similarly honor its commitment by continuing to do the same. We look forward to working with the Forest Service in the coming months on this important and challenging issue.

Response: Since the August, 2011 proposed action was made available for comment, 4FRI has been working with the stakeholder to develop a monitoring and adaptive management plan. The plan has to have indicators and thresholds based in science, be directly aligned with the desired conditions that are engrained in the purpose and need for this project, and support forest plan implementation monitoring. In February of 2012, the stakeholders provided 4FRI with a draft monitoring and adaptive management plan. That plan is still under review. The monitoring and adaptive management plan is integral to all the action alternatives. As chapter 1 and 2 of the DEIS are developed, the public, which includes stakeholders, will be provided with draft documents.

Comment 34-10 (Cara 33-10): III. CONCLUSION The GCT appreciates the opportunity to comment on the Proposed Action. We believe that if the Forest Service addresses the above issues in the Project's EIS, the Project will be successful at restoring northern Arizona's forests and enjoy a much greater level of social acceptability.

Response: Thank you for your constructive comments. We look forward to continuing to work towards landscape restoration.

Letter 35-20110901 – Sarah Reif, Arizona Department of Game and Fish (Cara Letter #36)

Comment 35-1 (Cara 36-1): The Arizona Game and Fish Department (Department) appreciates the opportunity to provide input on the US Forest Service’s Revised Proposed Action (RPA) for the Four Forests Restoration Initiative (4FRI) Coconino/Kaibab National Forests Project. Restoration of Arizona’s forests is of paramount importance, and the Department enthusiastically supports the Forest Service’s efforts to restore forest conditions that protect Arizona’s communities, watersheds, and wildlife habitats. Time is of the essence, and the Department is committed to 4FRI’s success.

Response: Thank you for support.

Comment 35-2 (Cara 36-2): The RPA proposes to conduct restoration activities within a 988,764-acre ponderosa pine ecosystem located on the Coconino and Kaibab National Forests. Restoration activities proposed include mechanical tree thinning, prescribed fire, oak and aspen restoration, spring and ephemeral channel protection/rehabilitation, and decommission/obliteration of closed or user-created roads. Activities are proposed on the Williams and Tusayan districts of the Kaibab National Forest and the on the Flagstaff, Mogollon Rim, and Red Rock districts of the Coconino National Forest (hereafter, Forests). The RPA is a revision of the Draft PA, which the Forests released in February 2011 and collected comments from the public over the following months.

Response: The comment provides a general overview of the proposed action and summarizes the process used to revise the proposed action.

Comment 35-3 (Cara 36-3): The Department appreciates the Forests ongoing, high level of collaboration with the Department and the 4FRI Stakeholders Group. The Department submitted comments on the Draft PA on March 14, 2011. We are also a Cooperating Agency on this project, and through this relationship we have provided wildlife information and recommendations to help inform and improve the RPA.

Response: Thank you for your input as it was invaluable for the purposes of refining the proposed activities.

Comment 35-4 (Cara 36-4): It would appear that many of our comments from the Draft PA and our participation with the 4FRI Team have been considered and incorporated in this RPA, and in particular we appreciate the significant increase in detail you now provide for treatment descriptions. We look forward to continuing to work closely with the 4FRI Team during development of the Draft Environmental Impact Statement and beyond. Below you will find a list of both general and specific comments on the RPA.

Response: See our response to comment 35-3.

Comment 35-5 (Cara 36-5): Level of Detail: Recognizing the efficiencies necessary to plan at the almost 1-million acre scale, getting down to site-specificity is difficult and impractical in the RPA. It is our understanding that most of that specificity is yet to come in the Draft

Environmental Impact Statement as well as the implementation strategy referred to in Appendix C. That specificity is essential to understanding small- and mid-scale impacts to wildlife, and we encourage the Forest Service to collaboratively engage the Department and other 4FRI Stakeholder Group partners in the development of said implementation strategy.

Response: Since the August 2011 proposed action was made available for comment, we have worked to identify issues, alternatives, and the metrics that would be used to evaluate environmental consequences for all resources. To date, we have shared the draft issues and alternatives with the public via NEPA update meetings and documents that have been posted to the web. It is accurate to state that the environmental consequences will provide the specifics in terms of impacts to resources at various scales, including wildlife. The implementation plan, which is currently under development, is the mechanism by which the actions would remain consistent with the predicted effects and the forthcoming decision. It should provide the additional details (and assurances) partners are seeking in terms of displaying how the actions would be implemented as designed.

Comment 35-6 (Cara 36-6): Research Proposal: The Department has had a long-standing interest in understanding the effects of tree-group size on a variety of wildlife species. The 4FRI's goal of developing and maintaining "the mosaic of tree groups and interspaces" provides an exciting opportunity to experimentally examine the relationships between group size and occupancy/abundance of a variety of species. Such a study would provide valuable information that can be used to better understand wildlife community response to restoration. To that end, the Department has developed a research proposal in collaboration with the Grand Canyon Trust. We recommend the Forests incorporate our experimental research project in its alternative analysis in the DEIS. Our proposal is attached to these comments, and we look forward to collaborating with you to further develop the proposal's concepts.

Response: By working with ADGF we were able to design treatments that met the intent of 4FRI and supported the ADGF's interest in understanding the effects of tree-group size on a variety of wildlife species. This research proposal is now incorporated into alternative C. The forest supervisors believe this is an excellent opportunity to provide valuable information for future restoration efforts.

Comment 35-7(Cara 36-7): Comprehensive Restoration: As mentioned in our comment letter on the Draft PA, we believe the importance of viewing 4FRI as a comprehensive, holistic approach to forest restoration cannot be understated. We fully support the RPAs proposals for restoring not only pine forests but also oak, aspen, grasslands, springs, ephemeral stream channels, grasslands, and decommissioned roadways. We encourage the Forest Service to seek opportunities to fund the full complement of restoration activities proposed in the RPA. To that end, we would like to begin working with the Forest Service and other conservation partners to begin leveraging funds that achieve these comprehensive restoration strategies.

Response: We agree that seeking opportunities to implement comprehensive restoration is needed and welcome assistance from the stakeholders. We realize we have been entirely focused on moving the DEIS forward.

Comment 35-8 (Cara 36-8): Monitoring and Adaptive Management: We appreciate the RPAs thorough discussion of how adaptive management will be built into the DEIS. The RPA makes reference to a monitoring and adaptive management plan that is under development. We

encourage the Forests to work with the Department and the 4FRI Stakeholders Group to develop a robust, collaborative monitoring plan that informs the Forests adaptive management actions.

Response: Thank you for your comment. Since the August, 2011 proposed action was made available for comment, 4FRI has been working with the stakeholder to develop a monitoring and adaptive management plan. The plan has to have indicators and thresholds based in science, be directly aligned with the desired conditions that are engrained in the purpose and need for this project, and support forest plan implementation monitoring. In February of 2012, the stakeholders provided 4FRI with a draft monitoring and adaptive management plan. That plan is still under review. The monitoring and adaptive management plan is integral to all the action alternatives. As chapter 1 and 2 of the DEIS are developed, the public, which includes stakeholders, will be provided with draft documents. We look forward to more involvement from 4FRI stakeholders as we finalize this document.

Comment 35-9 (Cara 36-9): Canopy openings, Page 9: The RPA states that the desired condition is a ponderosa pine ecosystem consisting of groups of trees with an open tree canopy density mixed with grassy interspaces. Here you define open as 10-39% tree canopy density. In Table 1, you also provide ranges for moderate (40-59%) and closed (60+%) tree canopy density. The Department agrees that the historic range of variability was likely dominated by an open tree canopy density, and this is well-supported by available science. However, the presence of native wildlife species that depend on moderate- to closed-canopy forest conditions suggest those canopy conditions were historically available at some proportion that sustained populations of those species over time. We encourage the Forests to expand their desired condition to recognize the presence of moderate- and closed-canopy conditions in the historic range of variability. This expanded desired condition should be clear that those denser patches were likely limited in their distribution when compared with open-canopy forests. Expanding this desired condition helps better integrate objectives for northern goshawk (NOGO) and Mexican spotted owl (MSO) into our overall restoration goals.

Response: Thank you for your comment. We have added the need to have moderate-to-closed canopies to meet species habitat needs to the desired condition. At the fine scale, the desired condition is a ponderosa pine ecosystem consisting of groups of trees that typically range in size from 0.1 acre to 1.0 acre in size with an open tree canopy density mixed with interspaces. Tree groups in the mid-age and older VSS classes have canopies that provide moderate-to-closed conditions for wildlife that are dependent on this type of habitat and these conditions are widely distributed on the landscape. Moderate to closed canopy conditions are met in a variety of ways including habitat for goshawk and MSO, steep slopes, and buffers for a variety of other resources including buffers around bald eagle roosts, other raptor nests, and caves. There is a need to use management strategies that: (1) promote tree regeneration and understory vegetation; (2) move the landscape towards the historic range of variability for tree canopy density, patterns of tree groups, and interspaces; and (3) provide a mix of open, moderately-closed, and closed canopy conditions.

Comment 35-10 (Cara 36-10): *Forest structure in NOGO and MSO habitats:* The RPA states that an even-aged tree condition is only desirable within NOGO nesting stands. However, forest plan guidelines do not call for even-aged management within nest stands, and your statement contradicts your footnote on Page 12 of the RPA.

Response: Thank you for making us aware that we have an error in the document. We have corrected the statement to refer to uneven-aged conditions.

Comment 35-11 (Cara 36-11): *Old Growth, last paragraph on Page 17:* The RPA states that most old growth allocations will occur within areas identified as MSO protected, target/threshold, and restricted habitats as well as NOGO postfledgling family areas (PFAs) and foraging habitat. With the exception of NOGO foraging habitat, most of these wildlife designations are represented by relatively small, discontinuous patches. Old growth, as defined by forest plans, includes not only dominance by large trees but also variation in tree diameters, standing and downed dead trees, and a multi-storied tree canopy. These characteristics provide important habitat diversity for wildlife. Connectivity of this habitat type is vital for wildlife movement and dispersal. Allocation of old growth within small, discontinuous patches does not provide optimal connectivity for wildlife. The Department recommends the Forests manage old growth allocations as larger more continuous patches as opposed to small, discontinuous patches. The RPA also states that while most sites do not currently meet forest plan criteria for old growth, the habitat types for which the 20% old growth was allocated are the closest to representing that condition. We would like to see a summary of the average stand condition based on the forest plan criteria for old growth. These criteria include: live trees in the main canopy by size class, variation in tree diameters, numbers of standing and down dead trees, tree decadence, number of tree canopies, total basal area (BA), and total canopy density. Some of this information is summarized in Table 10, but would also be useful in the old growth context to better understand how close allocated areas are to achieving old growth conditions.

Response: Since the August, 2011, we have compiled data as part of the vegetation analysis, which responds to your concern. We have existing old growth and developing old growth structural attribute information by restoration sub-unit, by alternative. In addition, we have maps which display the old growth allocation by alternative. It would be possible to overlay the old growth allocation by habitat type. This provides the ability to evaluate the connectivity that would be provided by alternative. The data, which will be part of the DEIS, is currently available upon request.

Comment 35-15 (Cara 36-12): Vegetation diversity and composition, Page 21: We support the RPA's emphasis on increasing vegetation diversity in the project area. Healthy, productive populations of Gambel's oak are essential for many wildlife including MSO, bears, turkey, songbirds, and bats. Aspen stands harbor higher wildlife species diversity relative to the surrounding conifer forests and inclusion of aspen treatments in this 4FRI project is imperative to our cooperative aspen recovery efforts which include elk population reductions in aspen areas. Grassland and savanna restoration are also important not only for pronghorn habitat connectivity but also for other sensitive wildlife such as the black-footed ferret, the Gunnison's prairie dog, and migratory birds. With regard to savanna restoration, the Department supports your proposed forest plan amendment to ensure that savanna sites can be truly restored and not beholden to forest plan NOGO guidelines.

Response: Thank you for your assistance in developing an approach which uses the best available science from ADGF to promote vegetation diversity and habitat connectivity for a host of species negatively affected by forest encroachment.

Comment 35-16 (Cara 36-13): Springs and seeps, Page 30: Springs and ephemeral channels are very important for all wildlife, in particular for native aquatic species such as leopard frogs and

garter snakes. We would like information on what process the Forests will use to prioritize springs and channels for restoration, and how they intend to fund such work recognizing that it is not identified as an activity in the 4FRI Request for Contract Proposals (see www.fs.usda.gov/4fri).

Response: At this time, no method for prioritization has been developed. The Forest Service is looking forward to working with its partners to develop this prioritization method and working together on implementation of restoration activities at springs and ephemeral channels.

Comment 35-17 (Cara 36-14): Proposed Action, Page 36, Aspen treatments: It is unclear from the bulleted list of proposed actions what types of treatments will occur in the aspen type. Fire can be a highly effective tool for stimulating growth of new aspen ramets within clones; are areas proposed for burning within aspen included in the overall acreage proposed for prescribed burning? There is also no mention of other tools that could be used to enhance aspen re-growth such as ripping. We recommend this technique also be included, and that the overall discussion of treatments within the aspen type be expanded.

Response: Thank you for your recommendation. We have added more details on aspen treatments. The aspen treatment design feature that has been developed is as follows: Inclusions of aspen remnants within portions of ponderosa pine stands would be regenerated by removing all post-settlement conifers from within 100 feet of the aspen clone. Some removal of aspen within the clone as well as ground disturbing activity or burning may occur to stimulate suckering. Each clone would be evaluated as to need for fencing or creation of other barriers to reduce ungulate browsing of regenerating aspen.

Comment 35-18 (Cara 36-15): Proposed Action, Page 42, treatments in MSO habitat: The Department supports the Forests and the US Fish and Wildlife Service in their efforts to protect and enhance habitat for the MSO. We support the proposed treatments within the MSO Protected Activity Centers (PACs) as well as the target/threshold and restricted habitat and we view these treatments as crucial not only for fire risk reduction but also for habitat improvement for the species as per the MSO Recovery Plan. We support the proposed forest plan amendment to harvest conifers larger than 9 inches within the identified PACs.

Response: Thank you for your support. We have worked closely with USFWS to design treatments that would improve habitat structure as well as reduce fire risk in PACs that are most at-risk. Our management recommendations are a result of using a variety of databases to review each individual PAC, field visits to many of the PACs proposed for treatment, and modeling individual stands within the PACs to develop our management prescriptions.

Comment 35-19 (Cara 36-16): Tables 13 and 14: It appears that Restoration Unit 2 is not being considered for any activities, including spring and channel restoration or road closure/obliteration. We recommend including a brief reasoning for the lack of restoration activities in RU 2.

Response: Thank you for bringing this to our attention. We have added text to the document which states, "RU 2, located west of I-17 and south of the Mogollon Rim (figures 4 and 5), has been removed from this analysis as the vegetation in this unit is not contiguous ponderosa pine. Therefore, no treatments are proposed in this RU". We will add a similar foot note to tables that frame data by restoration unit.

Comment 35-20 (Cara 36-17): Range of vegetation treatments, Pages 34-53: We recommend compiling all design features related to oak, aspen, and protection of snags and downed logs into one place. Currently the RPA includes those design features in some treatment types but not all (e.g., it's missing from UEA, IT, and SI) where we assume those design features would also apply.

Response. We agree. All design features will be in an appendix in the DEIS and referenced in the body in the document.

Comment 35-21 (Cara 36-18): Vegetation treatments, tree groups, Page 43: The RPA states that tree groups will generally consist of 4-20 dominant to co-dominant trees. We contend that tree groups could be larger in the historic range of variability; see White (1985) where groups of trees were documented as large as 44 trees per group. See also Appendix B, where you describe 40 trees per group at the fine scale.

Response: We agree and have used White (1985) and others to inform our desired conditions. The statement you reference above is at the 1/10-acre scale and was an attempt to disclose stocking at the group scale assuming tree groups would range from 1/10 to 1 acre on average. We understand the confusion this has caused and have clarified this narrative.

Comment 35-22 (Cara 36-19): Appendix B, Old Tree Retention Strategy: The Department applauds the Forests for honoring the comment echoed by many 4FRI stakeholders to avoid cutting of pre-settlement trees except in rare cases where human safety is at risk or where removal of the tree is necessary to avoid further habitat degradation. Retention of pre-settlement trees is an essential objective of a forest restoration project. We offer just a few comments on this document:

Response: Thank you for recognizing that we value recommendations that arise from collaboration. See our response below in comment 35-23.

Comment 35-23 (Cara 36-20): Scientific basis for old growth: we believe this section should be significantly expanded. Here is a list of references for your consideration which the Department obtained from the Ecological Restoration Institute at Northern Arizona University. References are ordered here by topic, and full references are available upon request: High genetic diversity: Kolonaski 2002; Resistance to surface fire: Agee 1998; High structural diversity for wildlife habitat: Bull and Hohmann 1994, Humes et al. 1999, Dodd et al. 2003, Chambers and Mast 2005; Historical record of forest dynamics: Fule et al. 1997, Soule and Knapp 2006. Appendix B states that each age class is important and the end result of abundant old trees is dependent on providing conditions that allow younger trees to grow into older trees. This is entirely dependent on the scale of analysis. Balanced age classes are important at the landscape-scale, but the Department does not agree with your justification for cutting old, presettlement trees to make way for regeneration at the stand-scale. This statement creates confusion with other statements in this document which say that old trees will not be cut except in specific circumstances.

Response: Thank you for providing additional literature. Since August, 2011, we have been able to edit and/or provide clarifications in the document. Regarding old growth, we would not be cutting, old pre-settlement trees for regeneration purposes. The OTRS, which has been made integral to each action alternative (B, C, and D) provides language to this effect and has been incorporated into each action alternative's design features.

Comment 35-23 (Cara 36-21): Appendix C Large Tree Retention Strategy (LTRS): Historical timber projects on the Coconino and Kaibab National Forests emphasized removal of large-diameter trees, and it was not too long ago the Department stood in opposition of many of those projects because they significantly degraded wildlife habitats. Not 15 years later, the Department is enthusiastically supporting the 4FRI project because of the profound need to reduce the risk of catastrophic fire and reduce unsustainable densities of young ponderosa pine trees that have also significantly degraded wildlife habitats. Our support for the 4FRI Project is based upon the project's emphasis on removal of small-diameter trees. That having been said, the Department does not support a cap or limit on the diameter of trees to be harvested because there are many instances where young large trees need to be removed to achieve restoration objectives. Appendix C is based on the LTRS that was collaboratively developed by 4FRI Stakeholders to identify those areas where stakeholders could agree that trees greater than 16 inches diameter breast height needed to be thinned. The Department participated in this process and supported the LTRS with reservations in the interest of moving the collaborative process forward. We appreciate the Forests recognition of this document but also fully support your clear statement that this LTRS does not represent a diameter limit/cap. We encourage the Forest to analyze the impacts of the LTRS on achieving the desired conditions across the project area as part of the DEIS.

Response: Thank you for this comment. Also see our response to comment 34-5 which outlines how we are addressing the concern that focuses on the conservation of large trees.

Comment 35-24 (Cara 36-22): The document asks for comments on what needs to be in an implementation strategy. To the extent possible, we recommend increasing site-specificity especially with regard to resulting forest structure, aspen treatments, spring/channel restoration prioritization and activities, and road decommissioning/closure prioritization and activities. A more in-depth process for how monitoring results will trigger adaptive management is also needed. The Department would also like to collaboratively pursue the concept of work-force training with the Forests and other 4FRI Stakeholders to ensure that desired conditions accurately translate from what is written in a planning document to what the forests look like post-treatment. This will be critically important if implementation takes place using a designation by prescription strategy, as opposed to designation by tree marking. As stated above, we encourage the Forests to engage the Department and others in the development of the implementation strategy.

Response: The implementation plan is under development and will be made available for review prior to the DEIS. As a cooperating agency and member of the interdisciplinary team, we will be looking for your input on the draft implementation plan and other DEIS components that become part of the implementation plan including design features and mitigation and the monitoring and adaptive management plan.

Comment 35-25 (Cara 36-23): Appendix D Mechanical Treatment and Fire Prioritization Process: In Table 21, you determine ecological restoration priorities by multiplying scores for mechanical treatment priority with scores for resources at risk. It is our understanding that mechanical treatment priorities were determined in part by how departed a site was from the desired condition and so it makes sense to consider this in a restoration priority exercise. However, in the context of strategically placing treatments, effectiveness will in large part be determined by whether we reduced the risk of large, uncharacteristic fire at the landscape scale. Therefore, we recommend you also analyze restoration priorities by multiplying scores for resources at risk by the fire priority rankings.

Response: The potential for undesirable fire effects and behavior was one of the fundamental inputs for prioritizing treatments. The fire criteria considered the potential for active crown fire, passive crown fire, fireline intensity, slope, soils at high risk of erosion, and proximity to the wildland urban interface. In addition to fire risk, there are a multitude of factors that can affect treatment prioritization including watersheds of concern, threatened and endangered species habitat, and economics. This task is best undertaken in the implementation phase because the disclosure of sequencing within a NEPA document is problematic. It would bind the agency to a fixed schedule that may be untenable due to weather, wildfire, markets, or other unforeseen circumstances. The process to begin treatment prioritization is underway and includes input from stakeholders and the Forest Service. We look forward to working together to work through this complex process.

Comment 35-26 (Cara 36-24): Again, the Department fully supports the 4FRI project and we are confident that the issues raised in these comments are ones that will be worked out throughout the planning process. 4FRI is an ambitious but critically necessary project for the future of Arizona's forests. We are committed to working with you through the planning, implementation, monitoring, and adaptive management phases of this project to ensure positive outcomes for wildlife and the public. Thank you for the opportunity to comment on the RPA. If you have any questions or need further clarification, please do not hesitate to contact me at 928-214-1253 or sreif@azgfd.gov.

Response: Thank you for your constructive comments and we look forward to continuing to work on making this project a success and implementable.

Letter 36-20110901 – Charlie Ester, Salt River Project (Cara Letter #37)

Comment 36-1 (Cara 37-1): The health of Arizona's forests has profound implications for the quality, quantity, and sustainability of the water supply that supports so many of Arizona's communities. The Four Forest Restoration Initiative is a critical effort for (1) protecting those forests from large, severe fires; (2) restoring many of the watersheds degraded as a result of substantial increases in tree density; and (3) placing the forests on the Mogollon Rim on a trajectory towards long-term sustainability. This Proposed Action represents a significant step towards realizing those goals.

Response: We agree. Thank you for participating in this project.

Comment 36-2 (Cara 37-2): In addition, this effort provides an important opportunity to quantify the effects of forest restoration on water quality, sedimentation, and water yield as well as determine the longevity of those effects following restoration. The Salt River Project would like the Forest Service to take advantage of this incredible opportunity by including the following elements of a paired watershed study in the preferred alternative of the project's Environmental Impact Statement: • Experimental Watersheds: We have identified a number of areas where experimental watersheds sized 800 to 1,200 acres could be used to test restoration treatment effects on water resources. The attached map shows areas (crosshatches) that may be divided into appropriately scaled watersheds to test treatment effects. Experimental designs would test the effects of forest opening size, orientation and pattern on snowpack accumulation and retention and subsequent snowmelt runoff, while not substantially interfering with treatment prescriptions already designated by the Forest Service. We recommend that a minimum of 14 experimental watersheds (including low, medium, and high elevation and average open area ranging from 25%

to 70%) be incorporated in the study to ensure adequate replication and allow stronger inferences regarding interactions of treatment type, elevation and aspects affecting water quantity and quality. • Control Watersheds: To accurately quantify the effects of restoration on the aforementioned variables control watersheds will be necessary. These control watersheds must be similarly-sized as treatment watersheds (800 to 1,200 acres). The attached map shows potential control watersheds (red). These must be screened to determine the most practical selections, but each selected control watershed will require amendment to the proposed action to eliminate any proposed treatments. Although not shown on the map, Watershed 13 in the Beaver Creek Experimental Watersheds, which is an existing control watershed with a long period of record, may be used as a control for the Beaver Creek drainage. A control in the Lake Mary (aka Walnut Canyon) watershed is necessary to gauge restoration effects on the City of Flagstaff water supply, which will provide transferrable knowledge for the Verde and Salt River systems. The Sycamore Canyon watershed would have experimental watersheds at 3 distinct elevations, so 3 control watersheds would be needed in the Sycamore drainage. We recognize that placement of experimental and control watersheds in the Oak Creek drainage is problematic due to slopes, checkerboard land ownership, and a large percentage of the area falling under other project authorizations. Therefore, a control watershed in Oak Creek drainage might be foregone after further consideration. Treatments: Our primary interest is in determining how restoration (as planned and implemented by the Forest Service) affects the water budget, including water storage in snow and soil, groundwater recharge and streamflow. Also, testing the effects of restoration on erosion and sedimentation is very important to determine best practices to reduce sedimentation of downstream reservoirs. Given the constraints that the Forest Service already has with regards to selecting treatment types, we are not proposing changes to treatments prescriptions. However, forest pattern (the orientation and size of openings) is known to influence a variety of hydrological factors and we hope to work with USFS staff on the implementation of prescriptions that allow further exploration of the relationship between the pattern of forest openings and the water budget. We are largely interested in evaluating treatment prescriptions that will result in >25% openings, whether in uneven-aged (UEA), intermediate thin (IT), stand improvement (SI), savannah or grassland treatments, since previous studies have shown that changes in water yield require at least a 30% reduction in tree cover and are generally optimized at >70% tree cover reduction. Fire: In order to estimate the short-term effects of restoration, we request that you plan the use of fire in experimental watersheds in ways that are consistent with experimental objectives. In the long term, we would be very interested in experimental use of fire at various return intervals to determine effects on soil properties, vegetation cover, snowpack, groundwater recharge and runoff. The Salt River Project would like to reiterate their support for the Four Forest Restoration Initiative and recognize the Forest Service for the progress that has been made to date. We also encourage the Forest Service to take advantage of this incredible opportunity to provide quantifiable estimates of the benefits of restoration.

Response: With some modification, the research proposal was incorporated into alternative C. Modifications were needed to assure the treatments meet the restoration purpose and need.

Letter 37-20110901 – Patrick Graham, The Nature Conservancy (Cara Letter #38)

Comment 37-1(Cara 38-1): The Nature Conservancy in Arizona appreciates the opportunity to comment on the refined proposed action (PA) for the first 988,764 acre project area of the Four Forest Restoration Initiative (4FRI), published August 17, 2011. The Wallow Fire this summer around the communities of Alpine, Nutrioso and Greer has underscored the importance of the work of 4FRI. We encourage the US Forest Service to move quickly yet thoroughly during the

analysis of environmental effects of treatments, and we offer our assistance in making the process as effective and efficient as possible. As you know we are a member of the Four Forest Collaborative. We support the points made in the letter submitted by the 4FRI collaborative and will not repeat those comments here.

Response: Thank you for the encouraging tone. Moving as quickly through the analysis to implementation is a goal that is under constant review. The timeline was affected by taking an additional 8 months to incorporate public and stakeholder comments into the revised proposed action. However, we strongly feel this was the correct approach for a project that has a unique opportunity to provide meaningful restoration actions across the landscape.

Comment 37-2 (Cara 38-2): The Conservancy commends the level of detail included in the refined PA in describing existing and desired conditions, the proposed action treatment descriptions, and the incorporation of adaptive management into the document. The use of photographs along with narrative descriptions is particularly useful in understanding and comparing the intensity of the various vegetation treatment methods. We provide the following comments in support of the proposed action.

Response: Thank you recognizing the progress that was made from draft proposed action to the revised version.

Comment 37-3 (Cara 38-3): The levels of vegetation treatment described in Tables 15 and 16 and subsequent pages represent a very wide spectrum of silvicultural approaches to achieving clearly stated goals or desired conditions. The maps in the appendix portray well the resulting heterogeneity of the landscape following treatments that will be necessary to increase forest resilience to disturbances, improve forest health and increase wildlife habitat quality. The diverse forest landscape, which includes ponderosa pine forest, pine savannah, pine-sage, pine-oak, grasslands, meadows, seeps and springs, ephemeral streams, and aspen forest, require these varied treatments. We will continue to work with the 4FRI Stakeholders' Science and Monitoring working group to establish robust monitoring methods and identify resources and partners to accomplish efficient and effective monitoring of biological and physical responses of ecosystems to treatments and the social and economic impacts as well. We are also encouraged to see that a conservative number of Mexican spotted owl Protected Activity Centers, restricted, and target/threshold habitats are slated for treatment within the PA.

Response: Thank you for the comment. A key objective has been to design restoration treatments that were inclusive of key resources and would result in landscape-wide heterogeneity and increased diversity.

Comment 37-4 (Cara 38-4): We will continue to work with the 4FRI Stakeholders' Science and Monitoring working group to establish robust monitoring methods and identify resources and partners to accomplish efficient and effective monitoring of biological and physical responses of ecosystems to treatments and the social and economic impacts as well.

Response: Thank you for continuing to work on this key component.

Comment 37-5 (Cara 38-5): We are also encouraged to see that a conservative number of Mexican spotted owl Protected Activity Centers, restricted, and target/threshold habitats are slated for treatment within the PA.

Response: While alternative B (proposed action alternative) and alternative D may restrict mechanical treatments up to 16-inch dbh to 18 select PACS, the alternatives include prescribed burning in a total of 72 PACs. In alternative C, mechanical treatment within the 18 PACS is increased to 18-inch dbh and prescribed burning would occur in 72 PACs. Of the 72 PACs, 56 PAC nest cores would be prescribed burned. We worked closely with USFWS to identify site-specific treatments that were needed (by PAC) to improve nesting and roosting habitat structure and quality – in addition to reducing the risk from crown fire. Our management recommendations are a result of using a variety of databases to review each individual PAC, field visits to many of the PACs proposed for treatment, and modeling individual stands within the PACs to develop our management prescriptions. In addition to treatments in PACs, all action alternatives would treat within restricted and target-threshold to improve the quality of the habitat. Proposed mechanical treatment acres in MSO habitat by habitat and acres for each alternative is included here for your reference (Table 2). This table will be part of comprehensive tables that are displayed in the alternative section of chapter 2 in the DEIS.

Table 2. MSO Mechanical and Prescribed Fire Acres by Habitat Type and Alternative

MSO Habitat Type	Alternative A (acres)	Alternative B (acres)	Alternative C (acres)	Alternative D (acres)
Restricted	0	67,378	67,378	67,378
Target	0	8,713	8,713	8,713
Threshold	0			
Protected	0	31,605	36,455	11,630
Total	0	107,696	112,546	87,721

Comment 37-6 (Cara 38-6): We recognize that a collaborative process is time intensive. Yet the benefits of increasing trust and understanding among the parties is important for long term success. It is also clear that a new model of addressing forest management needs to be developed to restore the health of thousands of acres more efficiently and timely than has ever occurred before. Failure to do so will result in more catastrophic fires. This is a big challenge for the US Forest Service and all involved. Having clear objectives and a commitment to applying learning will mean we can move more quickly and improve the results from the knowledge gained. This was the strength of the White Mountain Stewardship project. The Conservancy’s staff are dedicated to participating in the development of the draft EIS and final EIS and throughout the processes of thinning and monitoring our forests.

Response: Thank you for your continued commitment.

Letter 38-20110901 – Mary Lou Fairweather (Cara Letter #39)

Comment 38-1 (Cara 39-1): Although I was pleased that aspen was recognized as an imperiled tree species, I think the proposed 80+ miles of fencing will not work. There is a group of volunteers who are working very hard to take care of the 40+ fences already located on the Coconino NF, and they are not going to be able to take on more. Building fences is expensive, but maintaining them takes a tremendous amount of work year after year.

Response: We realize that constructing fence is time consuming and requires continual maintenance. However, it was not feasible to propose aspen restoration without recognizing that some type of protective barrier would be needed if we wanted treatments to be successful. For this reason, the potential methods for protecting aspen were expanded to allow maximum flexibility during implementation. Barrier methods also include the use of jackstrawing of materials. Regardless of what method is determined to best meet the site during implementation, a NEPA consistency review will have to be completed to assure that the selected method is in alignment with the environmental analysis and its predicted effects.

Comment 38-2 (Cara 39-2): A much better approach would be to have the stakeholders who are in charge of managing ungulate populations cooperate population reductions at the same time tree thinning is occurring. Hardwood trees and shrubs have been severely impacted for over 125 by intense browsing pressure in central Arizona. It's time to let range managers know it is not ok to let cattle graze right after fire has burned through an area. You loose the very plants that you sought to cover the ground. We need to convince hunting groups that our forests cannot reproduce with a diverse range of species if their getting eaten to death by large populations of hungry elk and deer. It makes sense that decreasing tree density will provide more forage, but it is not the only answer.

Response: Thank you for your recommendation. However, we did not feel that deferring treatment in aspen should wait until such time that ungulate use of aspen is significantly altered.

Comment 38-3 (Cara 39-1): Fencing is not the only answer. The Coconino NF Plan aspen amendment clearly states how many acres the forest intended to regenerate over the past planning period. These acreages were not met do to ungulate browsing. No amount of fencing is going to allow those acreages to be met. Unfortunately, even if you get aspen past the size that ungulates browse them back, elk will still severely damage the stems of larger sapling sized trees because they either strip the bark off with their antlers or peel it off with their teeth. Please have all groups work together to achieve the success of keeping aspen on the landscape.

Response: Please see our response to comment 38-2.

Comment 38-4 (Cara 39-3): On the subject of large tree retention strategy, I would like to simply state that silviculture is a science and that thinning the forest should be done with good science. There should not be any arbitrary diameter limit/threshold on what trees can be cut. That is just ridiculous. Why is 16 inches even mentioned? It's just some arbitrary number that someone pulled off the top of their head 15 years ago. Meanwhile, a whole recruitment of 14.5" trees have grown into this size class. The reason an arbitrary diameter limit doesn't work is that it does not acknowledge that trees grow and forests change overtime. They are dynamic. Any diameter limit should be site based and determined based on scientific modeling of where that site is and where that site is projected to go overtime.

Response: Thank you for this comment. We have been working through the large tree issue for several months. Please see our response to comment 33-5. This response provides a strategy on addressing post-settlement large trees.

Comment 38-5 (Cara 39- 4): I was really pleased to see regeneration openings of up to four acres in size, but I thought the average was way to low. I would really like to see forests that have very little evidence of pre-settlement trees really opened up.

Response: Thank you for your comment. The silviculturist for the 4FRI team carefully evaluated whether restoration objectives could be met within the confines of 4-acre openings. In the ponderosa pine (goshawk non-PFA habitat) where the desired condition is to move towards an open HRV condition, we are proposing forest plan amendments that would allow for managing those acres for less than 40 percent canopy cover and less than 3 to 5 reserve trees. The team worked to balance the vegetation structure objective with the potential effects to other resources, specifically wildlife.

Comment 38-6 (Cara 39- 5): I am glad to see that you're proposing to treat a few spotted owl PACS, however, I hope the National Forests have learned from their mistakes and stop walking away from owl PACS. Most of the owl PACS were lost in the Wallow fire. It's time to look at the pre-settlement evidence and try to safe guard these sites.

Response: Thank you for your support. Please see our response to comment 37-5, which provides the acres proposed for treatment in MSO habitat by alternative. We worked hand-in-hand with USFWS to determine specific treatments for MSO habitat.

Letter 39-20110901 – Paul Summerfelt, Greater Flagstaff Forest Partnership (Cara Letter #40)

Comment 39-1 (Cara 40-1): The Greater Flagstaff Forests Partnership appreciates the opportunity to comment on the Revised Proposed Action, released on August 17, 2011. It is a much improved from the initial Proposed Action, and, in general, we commend the staff on both the effort spent and the product produced. As an organization, we support efforts to restore our forests, protect our communities, and enhance wood utilization opportunities: we strongly feel the 4FRI project expands those goals onto a landscape where such efforts are sorely needed, and we pledge our continued support to ensure such work occurs. [...]Again, thanks for the opportunity to comment. We look forward to collaborating with the Forest Service as we progress through NEPA.

Response: Thank you for continuing to work with us on this project.

Comment 39-2 (Cara 40-2): In an effort not to simply add volume to the record, let me state that we largely echo those comments provided by both the NAU Ecological Restoration Institute and the 4FRI Stakeholder Group. We are actively engaged with both groups and support the science and collaborative nature each provides to this effort. We do, however, have three items we specifically wish to address.

Response: Please see our response to ERI's comments (letter 32).

Comment 39-3 (Cara 40-3): 1. We recognize that across as large a landscape as we are dealing with, that there was, and should be, a range of variability in terms of openings, basal area, canopy cover, tree size, etc. While we appreciate the need to identify ranges and averages, we do wish to see sufficient latitude in both language and practice to allow the full-spectrum of "historic inconsistency" (some thick, some thin, some open, etc.) to be present following treatments.

Response: We have made much progress since the revised proposed action was made available for comment. We utilized the last 9 months to finalize treatment design and evaluate whether the proposed actions would meet the various restoration objectives (purpose and need). In each action alternative, over 27 various treatments are proposed. Treatments vary to meet specific habitat

requirements and to meet particular objectives (such as providing for habitat connectivity or moving closer to the ponderosa pine historic reference condition). As a result, we feel that providing for heterogeneity has been achieved. How well this heterogeneity meets the habitat components for individual species or group of species is being evaluated. See comments from ADGF (letter 35). AGDF is a cooperating agency who, in addition with USFWS, provided assistance in designing treatments that would result in a heterogeneous landscape while providing habitat needs.

Comment 39-4 (Cara 40-4): 2. At the Stakeholder Group meeting on Aug 24th, there was considerable dialogue on two topics that need attention: a) Old Growth - We support the discussion to revise the language in the following manner: "Old trees will not be targeted for removal (cutting) except in rare circumstances. An example of this would be to cut one in order to accommodate the turning radius of a logging truck, rather than relocating an entire road. Another would be removing one to address human health and safety concerns

Response: Thank you for your comment. Since the August, 2011 revised proposed action was made available for comment, we have had time to review and refine draft documents. In response to comments received on some of the introductory language in the OTRS, the forest supervisors agreed to remove language that was perceived to be subjective or ambiguous. The OTRS was made integral to all action alternatives.

Comment 39-5 (Cara 40-5): b) Large Tree Retention Strategy - We understand that you have included a modified version of this Stakeholder document in the Appendix, but feel that many members of this group laboured long-and-hard, at the request of the agency, to produce the final version of this document. From our meeting on the 24th, it is obvious that some feel their effort, and that work, has been disregarded. At the very least, in the spirit of collaboration and trust, we strongly encourage you to engage in an open discussion with the Stakeholders as to why this was not included as an integral part of the Proposed Action.

Response: We have been working through this issue. As displayed in our draft issues and draft alternatives that were shared at the March 2011 NEPA update meeting, alternative C would incorporate a modified version of the LTRS. Alternative B and D would not. We hope to have further discussion with the public prior to the release of the DEIS and during the 45-day comment period for the DEIS. Also see our response to Grand Canyon Trust's comment on the LTRS, comment 33-5 in this report.

Comment 39-6 (Cara 40-6): We also recommend that you utilize the Strategy, in combination with other Stakeholder-approved documents (ex: Path Forward, Economics and Utilization, etc).

Response: The documents served to position the environmental analysis and were invaluable as they set the stage for being able to propose landscape restoration.

Comment 39-7 (Cara 40-7): 3. Social License, long identified as THE key to sustainable, long-term success, is based upon leadership, open-and-fruitful collaboration, effective-and-visible results, and continual communication. This requires attention to such things as tracking social awareness-and-attitudes in order to address emerging issues, developing a prepared workforce who becomes part of the economic solution, and reliable long-term wood supplies to support the required industry.

Response: Thank you for your comment.

Comment 39-8 (Cara 40-8): Although attention is given in the Proposed Action (and elsewhere) to the necessity of "adaptive management and monitoring", what seems to be absent are the social and economic monitoring requirements necessary for success. We urge the Forest Service to identify, support, and include such needs in this process, and to actively engage outside interests who can provide the technical assistance required in this endeavour.

Response: We believe we have been consistent in our message that required monitoring would have to be specific and address key elements that also can be used at the forest level (forest plan monitoring). Additional tiers of monitoring have been developed as part of the document the stakeholders created. The monitoring and adaptive management document will display the minimum required monitoring; and, additional monitoring that could be initiated if funding became available (and commitments were my partners to conduct the monitoring). Our approach to monitoring and adaptive management should become clear when this document is available for review and the approach to multi-party monitoring is solidified.

Comment 39-9 (Cara 40-9). Again, thanks for the opportunity to comment. We look forward to collaborating with the Forest Service as we progress through NEPA.

Response: Thank you for your continued support and efforts to move us towards meaningful landscape restoration.

Letter 40-20110902 – 4FRI Stakeholders (Cara Letter #43)

Comment 40-1: On behalf of the Four Forest Restoration Initiative Stakeholder Group ("Stakeholder Group" abbreviated as "SG") we appreciate the opportunity to comment on the Revised Proposed Action ("RPA") as released on August 17, 2011. The SG submitted comments on the First Proposed Action on March 11th. One of the issues that concerned the SG was the need for significantly more detail. We value the novel approach the Forest Service has taken during scoping to do a preliminary and revised Proposed Action. It has enabled a continuing dialogue that translates into greater efficiencies during the EIS analysis. The comments included in this letter were reviewed and approved by the Stakeholder Group and represent an official communication of the Stakeholder Group.

Response: Thank you for working with us from the initial proposed action to the revised proposed action and through the entire analysis process.

Comment 40-2: Strategic Placement of Treatments. The GS understands that a prioritization process was used by the ID Team to identify portions of the landscape with "High" and "Moderate" Ecological Restoration needs. We appreciate that this prioritization method integrated stakeholder values and earlier analyses (Landscape Strategy and Small Diameter Wood Supply), as noted in Appendix D of the RPA.

We understand that the sequencing decisions will be planned as part of the implementation process and look forward to working with the Forest Service to collaboratively identify optimal sequencing approaches. However, we want to reinforce our position that how treatments are sequenced will have an impact on protecting values at risk from unnatural crown fire, in addition to how effectively and efficiently we can rapidly change fire behavior (the strategic sequencing of treatments). We believe that by strategically sequencing treatments (in time and place) the 4FRI will be able to align ecological and economic goals consistent with the vision articulated in the SG foundation documents, including the Landscape Strategy. We recommend that the

implementation process be informed by planning that guides unit selection and sequencing temporally and spatially.

Response: We look forward to working together on this important step in the implementation phase.

Comment 40-3: Old Growth. We appreciate the commitment made by the Forest Service to avoid cutting old trees. We feel the language in the RPA does not adequately reinforce that intent. We recommend that the wording in the RPA is modified in the DEIS to state: “Old trees would not be targeted for removal (cutting) except in rare circumstances. However, exceptions may be necessary. An example of this would be to cut an old tree in order to accommodate the turning radius of a logging truck, rather than relocating an entire road. Another exception would be removing an old tree to address human health and safety concerns.

Response: Since the August, 2011 revised proposed action was made available for comment, we have had time to review and refine draft documents. In response to comments received on some of the introductory language in the OTRS, the forest supervisors agreed to remove language that was perceived to be subjective or ambiguous.

Comment 40-4: Planned and Unplanned Ignitions. We appreciate the emphasis the RPA places on fire as a management tool. We look forward to studying the effects analysis on this topic. We also recognize that managing unplanned ignitions is a decision made by a line officer and not possible to analyze in the effects analysis. We are encouraged that the Forest Service is presently managing several unplanned ignitions for resource benefits and hope that by implementing 4FRI treatments unplanned ignitions can play an even more significant role in forest management in the future.

Response: Thank you for your understanding the uncertainties this would have presented in terms of completing a site-specific effects analysis. The fire ecology analysis will be available for review before the DEIS is published and the 45-day comment begins.

Comment 40-5: Ecological Restoration. The SG acknowledges that the RPA expanded the desired conditions to include restoration goals. At broad scales, we appreciate that desired conditions in the RPA are in agreement with collaborative desired conditions as spelled out in the Landscape Strategy and Path Forward. Desired conditions are still needed at finer scales. We ask that collaboration to develop desired conditions consistent with the SG landscape strategy and other foundation documents continue through the NEPA analysis process. At a minimum we recommend the continued use of 4FRI collaborative products as an evaluation/check point for desired conditions. These include the following documents: Path Forward, Landscape Strategy, Economics and Utilization, Large Tree Retention Strategy and the MOU.

Response: At the June, 2011 4FRI public meeting, we presented a crosswalk between the landscape strategy desired conditions and the 4FRI purpose and need. In most cases, we were in alignment. However, we did highlight those areas where the desired condition exceeded the scope of the 4FRI project and were most appropriate at a forest-wide, forest plan level. We believe that fine scale desired conditions are facilitated through the purpose and need, resource-specific project design features and mitigation (that were not fully developed in August of 2011), through the application of strategies including the OTRS (incorporated into all action alternatives), and through the LTRS that has been incorporated into alternative C. We continue to work with stakeholders and interested parties through the subject of tree group size and the scale at which

canopy cover would be measured. We have modified the desired condition for canopy openings (which focused on open canopy reference conditions) to include the need to have moderately-closed to closed canopies for a host of species.

Comment 40-6:Monitoring and Adaptive Management. The SG appreciates the commitment made by the Forest Service in the Scoping Report to working with the SG to develop a monitoring and adaptive management plan. We look forward to working with you on that plan. In addition to ecological effects of landscape scale restoration, recognition, preparation and tracking of both the social and economic impacts of the 4FRI project is paramount to the project's success. Social awareness, knowledge and support coupled with economic viability, such as a prepared workforce, adequate infrastructure, and reliable wood supplies, are critical factors that will be primary drivers of the project's progression. As requested by the first SG response letter, the RFP provides more detail with respect to post-treatment forest structural conditions. These are critical to predicting the effects of the treatments proposed by 4FRI and assessing if prescriptions are consistent with the Desired Conditions. The ranges described are a significant step to ensuring that the monitoring program has sufficient power to assess post-treatment conditions. Using the desired conditions developed for the SG landscape strategy, the SG has developed a series of indicators and metrics that can be used to describe the anticipated effects of the treatments. These anticipated effects can serve as a starting point for developing the necessary thresholds and benchmarks for adaptive management. We recommend that the DEIS outline an adaptive management approach that describes the decision as it relates to multiparty and all monitoring (biophysical, social, economic). Furthermore, it is likely that an implementation guide will be necessary to provide sufficient detail for adaptive management to occur.

Response: Since the August, 2011 proposed action was made available for comment, the 4FRI team has been working with the stakeholder to develop a monitoring and adaptive management plan. The plan has to have indicators and thresholds based in science, be directly aligned with the desired conditions that are engrained in the purpose and need for this project, and support forest plan implementation monitoring. In February of 2012, the stakeholders provided the 4FRI team with a draft monitoring and adaptive management plan. That plan is still under review. The monitoring and adaptive management plan is integral to all the action alternatives. As chapter 1 and 2 of the DEIS are developed, the public, which includes stakeholders, will be provided with draft documents.

Comment 40-7: 6. The Large Tree Retention Strategy (LTRS). The SG understands that the Forest Service included a modified version of the SG LTRS in the Appendix in order to allow the general public to provide comment. We emphasize that the history and past work of the collaborative to develop these strategies, in response to a request from Forest Service partners, add value and are integral to Forest Service planning efforts for the first analysis area. The SG recognizes and appreciates the utilization of the Old Growth Protection Strategy and reference to the LTRS in the refined PA. However we are disappointed that the LTRS was not included as an integral part of the PA. We recommend the USFS use the full and complete LTRS in combination with other collaboratively approved documents as the basis of the actions and strategies conveyed by the stakeholder group to the USFS to be analyzed in the EIS. Finally, there are some outstanding management issues that have not been discussed with full collaborative participation and/or with Forest Service staff. These issues will be raised by individual stakeholder's comments. We expect that some or all of these issues may be considered at the discretion of the stakeholder group in the future and we invite the USFS to request collaborative help in addressing other relevant issues and concerns. When that occurs we anticipate discussion to be a collaborative

process that engages the Forest Service. We look forward to collaborating with the Forest Service as we progress through NEPA.

Response: Please see response to comment 33-3.

Letter 41-20110904 – Justina Boyle (Cara Letter #8)

Comment 41 (Cara 8-1) : The plan sent to me was far more than I could absorb but the concept was clear. The only thing missing was the old idea of allowing area residents to gather downed wood from the forest floor before it is turned into huge brush piles. I remember being allowed to glean firewood from the top of Schnebly Hill road in the late 60's and it was a help to the forest and to the residents. Thank you for keeping me in the loop.

Response: Thank you for your interest in the 4FRI project. We believe that there will be adequate fuelwood available from untreated areas and as a by-product from other restoration and fuels reduction projects that are conducted on both forests. The Flagstaff and Mogollon Districts (Coconino) and the Williams and Tusayan Districts (Kaibab) designed projects to ensure fuelwood is available for use.

Letter 42-20110908 – Sharon Masek Lopez (Cara Comment #35)

Comment 42-1: The proposed action does not appear to have balanced consideration of all resource values. Treatment area selection is largely leveraged by considerations for goshawk and MSO, and treatment types are largely determined by site productivity. These two approaches seem like “business as usual”, i.e. protecting high profile threatened and endangered species and growing more healthy trees. Many other resource values that should play prominent roles in ecological restoration seem to take a back seat. As it stands, the proposed action appears to fall short of actual ecological restoration, and it may not adequately reduce the threat of severe wildfire. The PA is a good start, but much greater consideration of multiple resource values is needed in the draft EIS. One way to accomplish this would be a more complete consideration of Large Tree Retention Strategy and incorporation of many of its principles into the body of the EIS.

Response: We disagree. Using a wealth of comments and work generated from collaboration, we crafted a restoration proposal that contains a suite of actions that will have long-term beneficial effects to physical and biological resources (including habitat quality and quantity for a host of species). We have forest plan requirements that we must follow. These requirements have been designed to address species viability for the goshawk and MSO. Meeting these requirements largely dictates the type and extent of treatments that can occur since, once stratified, the forest is either goshawk or MSO habitat. For this reason, it may appear that much attention is given to these species.

There are areas that will not meet desired conditions for fire, regardless of the alternative because of wildlife concerns. The majority of these areas are in habitat classified as restricted. Approximately 4,426 acres of post-treatment high-severity fire is predicted. This exceeds the maximum desired condition of 15 percent of the area being at risk from high-severity fire. Post-treatment fire modeling indicates that, at the project level, all action alternatives would meet the desired condition. At the restoration unit (RU) level, the same is true except for alternative D and RU 1, which exceeds the desired condition by 10 percent. At the restoration subunit (SU) level, all action alternatives would meet desired condition for fire behavior with one exception, SU 6-4.

However, within SU 6-4, all but 1 or 2 of the acres of modeled crown fire are passive crown fire. In terms of effectiveness, mechanical treatments that restore the forests to a trajectory of groupy/clumpy arrangements that were historically normal have already been shown (2011 Apache-Sitgreaves NF Wallow Fire) to drop crown fire to the ground. We expect there may be a higher level of severity than is historically expected from first entry prescribed fires, but this is necessary to facilitate reintroducing fire to the entire landscape in a timely manner. Initial entry may consume more fuel than would have been present historically. These burns move canopy characteristics closer to their HRV and scarify seed banks with heat and smoke, etc. Regarding the LTRS and the OTRS, please refer to our response to comment 34-4 and 34-5.

Comment 42-2: This proposed action should be informed by best available science. There is a wealth of significant research to support restoration decisions, and yet the PA is sorely lacking in citations. Please, incorporate literature review into the EIS.

Response: Please see our response to letter 32 and please note the difference between a proposed action and a NEPA analysis. The latter will be what constitutes much of the forthcoming DEIS.

Comment 42-3: Page 9 Table 1. It would be helpful if the numbers in this table could be compared with the projected post treatment canopy densities later in the document with a reference here of where to find that table.

Response: As we develop chapter 3 of the DEIS, the correlation between the existing and desired condition will be made and include reference to tables that display the existing condition. Specific resources, such as vegetation and wildlife, will have comparative tables.

Comment 42-4: Page 10. A definition of MSO “protected and target/threshold habitat” would be helpful. Are there any cases in which larger canopy openings would be desirable even though a location has high site productivity? Are there tradeoffs in understory biomass or diversity if the site productivity is dedicated to ponderosa pine? Is presettlement evidence to be used everywhere or only on sites with soils that have an open reference condition?

Response: The definition of MSO protected, target, and threshold habitat will be provided in the DEIS glossary and in the wildlife report. MSO habitat covers a range of conditions from dense, closed canopy stands that constitute nesting and roosting habitat to restricted habitat outside of target and threshold conditions. There is a direct trade-off between increasing overstory and decreasing understory production. In some MSO habitats, developing large trees with dense canopy cover is the priority. In other areas within MSO habitat, creating interspace, restoring meadows, springs, and aspen, and releasing large trees and oak will encourage understory development. However, open pine-oak stands or savannas are not likely to be created within MSO protected, target, or threshold habitats. The desired condition for canopy openings is guided by reference conditions specific to the ponderosa pine type within the project area and meeting the forest plan habitat specific standards and guidelines. Pre-settlement evidence will assist in the actual placement, shape, and size of the openings and will result in a range of tree group/opening patterns on the landscape. There may be areas on the landscape where evidences suggest larger openings existed previously. Pre-settlement evidence would not be the sole method for determining the resulting stand condition. We are bound by, and will not exceed, forest plan or forest plan amendment (in the case of savanna restoration treatments) guidance on opening size even if evidence suggests otherwise. Since the action alternatives incorporate the implementation

plan of the OTRS by having design features that relate to pre-settlement trees, pre-settlement evidence would be used project-wide to assist in the placement of treatments.

Comment 42-5: Page 12. Please reword the 8th bullet as follows. “moving toward the desired condition in groundwater dependent ecosystems by having springs, wet meadows, and riparian ecosystems function at, or near potential”. Seeps are low discharge springs, so there is no need to state “springs and seeps”. “Springs” covers both just fine. Springs are distinctively different ecosystems than riparian ecosystems, or wet meadows, so please list all the separately. The USFS is moving to a nationwide approach for inventorying, assessing, monitoring, and restoring “groundwater dependent ecosystems”. We would recommend citing and following these guidelines. <http://www.fs.fed.us/r4/projects/gwde/documentation/index.shtml>

Response: Thank you for recommendation. However, our use of the terms springs and seeps is consistent with our current forest plans and the draft revision efforts. For this reason, we will continue using terminology that is consistent with our forest direction.

Comment 42-6: Page 14. Table 2 – Please, indicate what proportion of these acres will be part of the treatments and what proportion will be excluded from treatments, either here or in a later table and reference where to find the table. Paragraph 1 – It would be helpful to clarify whether Reynold’s distribution is for ALL goshawk habitat (PFAs + foraging areas) or just PFAs. If it is for all goshawk habitat, please indicate how many acres of the proposed treatment area are affected by the goshawk guidelines, or reference where it is discussed later in the document. This could be accomplished in table 4 by adding a column indicating acres of treatment needed to accomplish desired distribution. Paragraph 2 – Please, list the 14 key prey species.

Response: Thank you for your comment. The purpose of table 2 is to describe the existing condition of the habitat as this is part of the purpose and need. The disparity between the existing and desired condition provides the need for change that results in the proposed action. How the needs are addressed (acres to be treated) are reflected in the proposed action (and will be forthcoming in chapter 2 of the DEIS). Regarding the reference to Reynolds’ distribution of goshawk habitat, it refers to all goshawk habitat. That is why tables 3 to 5 showing existing and desired conditions for VSS for both foraging (non-PFA) and PFA/nest habitat. Regarding referencing all 14 key prey species, this is best addressed in the wildlife section in chapter 3 of the DEIS, as well as the wildlife specialist report.

Comment 42-7: Page 16 Table 6 is difficult to understand. Mixing SDI and TPA > 18” is confusing. In the last row of the table shouldn’t the targets be expressed as numbers of trees per acre not percent? A definition of “target/threshold” is lacking in the document, making it more difficult to understand the meaning of the column headings.

Response: Forest structure in MSO habitat is evaluated based on criteria listed in the Coconino and Kaibab NFs forest plans. The criteria includes percent of total stand SDI for the size classes listed and trees per acre (TPA) of trees 18 inches and larger. We will adjust the column headings to clarify the criteria we are using.

Comment 42-8: Last paragraph – Define EMA here and/ or at first instance. Add EMA to glossary. Give a more complete rather than generalized definition of old growth. What are the number of large trees per acre, basal area, canopy cover percent, number of dead standing trees, and number of down logs in old growth?

Response: Thank you for your comment. The definition of EMA has been added to the glossary in the DEIS. The definition of old growth, for the purposes of summarizing it in the purpose and need, is sufficient as there are adequate references to the forest plans. Since the August, 2011 document was a proposed action, the FVS (forest vegetation simulator) data that calculates the constitute elements of old growth, as part of the environmental analysis, had not been completed. That data is now available and is displayed within the vegetation analysis by alternative and will be addressed in the DEIS. As soon as practicable, the working draft of the DEIS will be shared.

Comment 42-9: Page 19 Provide citations for the basis of Table 10. What about desired conditions for other natural resources besides goshawks and MSOs?

Response: The reference requested is the forest plans as stated in the introduction to the purpose and need section: “The purpose and need for proposing an action was determined by comparing the objectives and desired conditions in the Coconino NF and Kaibab NF Land Resource and Management Plans (forest plans) to the existing conditions related to forest resiliency and forest function”. Regarding desired conditions for other resources, please refer to our response to comment 42-1 of your letter. Each resource will evaluate how the alternatives respond to the desired conditions found in our forest plans and respond to compliance law, regulation, and policy requirements.

CommNet 42-10: Page 21 It is stated that “Approximately 25 to 35 percent of the project area has some level of infection ranging from light to extreme.” However, there is no indication of how many acres are infected enough that they would be treated with intermediate thinning. Please, estimate the number of acres of treatment for mistletoe infection.

Response: In all action alternatives, intermediate thin 10 (10 percent openings across the landscape) to address mistletoe infection would occur on 7,766 acres. Intermediate thin 25 (up to 25 percent openings across the landscape) would occur on 11,871 acres in alt B and D and 11,858 acres in alt C. Intermediate thin 40 (up to 40 percent openings across the landscape) would occur on 39,189 acres in alternative B and D and 39,039 acres in alternative C.

Comment 42-11: Page 22 The following statements require citations: Historically (late 1800’s), grassland communities had less than 10 percent tree cover until past actions such as grazing, logging and fire suppression reduced or eliminated the vegetation necessary to carry low intensity fires. An assessment completed in 2008 found that within ponderosa pine on the Coconino NF, grasslands have decreased from approximately 8 to 3 percent since historic conditions (generally pre-1900). On the Kaibab NF, grasslands have decreased from approximately 15 percent to 7 percent.

Response: Thank you for your comment. The citations have been added. This information is derived from assessment documents prepared for forest plan revision on both forests.

Comment 42-12: Page 28 The desired conditions for fire seem at odds with desired conditions for MSO and goshawk. So much of the potential active crown fire area corresponds with owl and goshawk habitat. How can we accomplish “No more than 10 percent of the project area should be prone to crown fire” while we are not treating, or only minimally treating, large numbers of acres that are reserved for owls and goshawks?

Response: The silviculture report lists the acres of treatment by habitat and the overall pre and post-treatment structural attributes within each habitat. For MSO habitat this is at the restoration

unit (RU) and habitat scales. For goshawk, this is at the restoration sub-unit (SU), RU, and habitat scales. This will give the reader a better idea of the diversity of treatments and post treatment heterogeneity of forest structure on the landscape. The fire ecology report will disclose post-treatment fire behavior within the project area.

There should be no conflict between restoring fire on the landscape and managing for goshawk habitat. There are several forms of MSO habitat and fire risk varies with the kind of habitat being referenced. MSO restricted habitat would largely be treated to create groups of trees with interspersed gaps. Protected habitat includes PACs and steep slopes. Both would largely be managed to maintain dense forest conditions. As a result, this habitat would be at higher risk from fire. While we are doing limited mechanical treatments in these habitats, we would be prescribed burning in both habitats to reduce ground fuels and raise the crown base height (alternative B and C). Treatments around protected habitat would decrease the threat of high-severity crown fire outside of protected habitat. The MSO Recovery Plan acknowledges that PACs are more vulnerable to high-severity crown fire, but it is hoped that treating much of the landscape, as well as fuel reduction in protected habitat, would enhance the ability to retain these key habitats for MSO.

Comment 42-13: Page 30 Table 12 is truly frightening. The risk of large high-severity fires is so great, the EIS should more directly address sequencing of treatments to reduce the potential spread of large fires. What is the source of the statement “Fifty-one developed springs on the Coconino NF are not functioning at or near potential and 27 springs on the Kaibab NF have reduced function”? Recommend simplifying document by referring to “Springs and seeps” as just “Springs”. Seeps are low magnitude discharge springs, so they don’t need to be listed separately. Feel free to cite (Springer and Stevens 2009). Springer, A.E. and L.E. Stevens. 2009. Spheres of Discharge of Springs, *Hydrogeology Journal*, doi: 10.1007/s10040-008-0341-y. In the first paragraph for the Springs section, please include “diversions and other flow modifications” to the list of items which have reduced function at springs.

Response: Please see our response to comment 34-8 on sequencing and comment 42-5 regarding using the terms seeps and springs. We agree that diversions and other flow modifications have affected spring function and will add this to the document. Regarding springs, the reference to the existing condition of springs comes from a professional evaluation of springs within the project area by our soils and watershed specialists. However, based on recent data collected by Springer and Stevens, it is estimated that approximately 90 percent of Arizona springs are ecologically impaired or totally devastated by human activities such as: (a) groundwater pumping and water well drilling that has depleted or drained water stored in perched aquifers causing associated springs to cease discharge, (b) piping (i.e. diversion) of spring discharge from the spring source to other locations such as tanks and troughs, eliminating surface flow from the spring source, (c) installation of spring boxes and similar infrastructure (i.e. modification – some of which are no longer functioning or are in disrepair) to collect spring discharge, thus reducing or eliminating surface flow, and (d) urbanization that has affected spring water quality and increased stormwater runoff, thus decreasing water infiltration to soils. These human impacts have adversely affected many of the springs within the project area, resulting in springs that no longer flow in their historic “spheres of discharge” as described by Springer and Stevens (2009).

Reference used in this response:

Springer, A.E. and L.E. Stevens. 2009. Spheres of Discharge of Springs, *Hydrogeology Journal*, 17:83–93; doi: 10.1007/s10040-008-0341-y

Comment 42-14: Page 32 There should be some reference to the use of geomorphic principles to restore the function of natural channels in ephemeral streams. Even over 20 years, 43 miles is a lot of channel to restore; projects should be prioritized to make the best use of available funds. Watershed restoration, such as proper road decommissioning, must happen in tandem with channel restoration in order for amendments to continue to function properly.

Response: We agree that geomorphic principles should and would be used as part of the design for each channel restoration project; however, the design is outside the scope of the NEPA process and is an implementation task. The prioritization of these treatments has not yet occurred. We look forward to working with our partners to develop this prioritization. We agree that where roads and channel restoration needs exist in the same location, that they should be accomplished at the same time.

Comment 42-15: Page 34 Discussion of road decommissioning is too vague. Discuss the best management practices that will be used to reduce erosion and sedimentation due to concentrated runoff along road beds, such as water bars, rolling dips, removal of culverts, etc., or reference where in the document these are addressed. Restoring the road prism to its natural condition seems like an exorbitantly expensive and unnecessary procedure in most cases. The focus should be on cost effective means of restoring natural drainage patterns. Dissuading use of abandoned roads by ATVs should also be a priority to reduce erosion.

Response: Best management practices and design features for roads will be included in the DEIS as well as the soil, water, and transportation specialist reports. A decommissioning adaptive management matrix is available in the transportation specialist report that looks at a variety of decommissioning methods, from signing only to total recontouring. Page 55 of the proposed action (August, 2011) briefly described actions that will be included in the matrix and noted that the amount and intensity of treatment would be variable.

Comment 42-16: Page 35 Will the “comprehensive monitoring and adaptive management plan” be part of the EIS? Among other monitoring strategies, a paired watershed study is needed to monitor effects of forest treatments on groundwater recharge, surface water flows and sediment discharge. Some members of the Science and Monitoring Work Group have preliminarily identified watersheds that could serve as control watersheds (see PA comment letter from Salt River Project). These control watersheds must be identified in the proposed action or EIS, because most of these watersheds include stands where “no treatment” would be a departure from the currently proposed treatment prescription.

Response: Since the August, 2011 proposed action was made available for comment, 4FRI has been working with the stakeholder to develop a monitoring and adaptive management plan. The plan has to have indicators and thresholds based in science, be directly aligned with the desired conditions that are engrained in the purpose and need for this project, and support forest plan implementation monitoring. In February of 2012, the stakeholders provided 4FRI with a draft monitoring and adaptive management plan. That plan is still under review. The monitoring and adaptive management plan is integral to all the action alternatives. As chapter 1 and 2 of the DEIS are developed, the public, which includes stakeholders, will be provided with draft documents. Regarding the watershed research proposal, with some modification, the research proposal was

incorporated into alternative C. Modifications were needed to assure the treatments meet the restoration purpose and need.

Comment 42-17: Page 36 What about follow up burns? More detail is needed in the document regarding how/if natural fire return intervals will be mimicked using prescribed fire and/or managed wildfire. For several resource values repeat burning throughout the project period would be beneficial, but repeat burning is not explicitly discussed in the PA. “Prescribe burn only on approximately 205,278 acres” sounds incredibly risky. More evidence should be presented that this number of acres is suitable for burn only and can be safely burned.

Response: During the implementation period, two prescribed burns would occur. Each action alternative contains a statement that maintenance burning may continue until objectives are met and the fire specialist report evaluates the use of maintenance burning until 2040. We are not able to speculate that wildfire would be used to maintain the project area; however, the fire environmental consequences will display how treatments affect the ability to use wildfire within the project area. As long as resource conditions within the project area do not measurably change (a change that may cause a predicted effect to be exceeded), the forests can conduct a NEPA consistency review to determine if maintenance burns can continue past the initial implementation period.

Comment 42-18: Restore 78 springs” – More details are needed as to how 78 were selected. There are more than 200 springs on the Kaibab and Coconino National Forests. A prioritization process has been proposed by NAU and will hopefully be funded by a grant from the Nina Mason Pulliam Charitable Trust. The PA should give some information about how springs will be evaluated and selected for restoration. Otherwise the 78 springs referenced appear to have been arbitrarily selected. How was the figure “82 miles of protective (aspen and springs) fencing” derived? Some discussion is needed in the narrative above regarding the selection process for fencing. Otherwise “82 miles” appears arbitrary. The words “Old tree implementation strategy” should read “Large Tree Retention Strategy developed by the 4FRI Landscape Strategy Work Group”. The LTRS should be incorporated into the PA in a more meaningful way. There should a discussion about how it can/will inform application of the treatment designs.

Response: The number of springs directly correlates to the number within the project area – not within both forests. The miles of protective fencing for springs and aspen has been broken out with springs having a maximum of 4 miles of protective fencing and aspen a total of 82 miles. A simple mathematical calculation was used based on the size of the springs and the size of the aspen stands. A design feature for all fencing includes coordination with the forests’ landscape architect. The actual selection of fencing will occur at the time that the site-specific restoration action is being addressed by the implementation team. Regarding the LTRS, see our response 41-22. The OTRS has been incorporated into all action alternatives’ design features, the monitoring and adaptive management plan, and project implementation plan.

Comment 42-19: Page 40 Figure 25. How will road decommissioning be funded? Some of the highest density areas for road decommissioning have very little wood fiber slated for harvest. Is the plan realistic?

Response: It is unknown how road activities would be funded other than through appropriated funds. The point of including road decommissioning in this analysis is to identify the role roads

play in terms of landscape restoration, identify which roads need to be decommissioned, and evaluate the environmental consequences through NEPA.

Comment 42-20: Page 42 Table 15. It would be helpful to have the treatment types further broken down into the percent open. Also, if here or in a separate table a comparison could be made between treatments in goshawk areas and the desired future conditions for reducing high intensity fire, it might provide some assurance to readers that protecting the landscape from crown fire is not compromised by protection of goshawk habitat and MSO habitat also.

Response: This should become clear when key resources (vegetation, fire, wildlife) have developed environmental consequences for each alternative. This information will be part of chapter 3 of the DEIS, as well as within each respective specialist report.

Comment 42-21: Page 57 Springs – Range of treatment. Prescribed fire may not necessarily be a beneficial treatment in all springs ecosystems or wet meadows. For example, previous prescribed burns in Hart Prairie have generally led to significant mortality of Bebb willow. Each spring and wet meadow should be individually analyzed to determine if a prescribed fire is an appropriate treatment.

Response: We agree that prescribed fire may not be needed at specific sites. A goal of this analysis is to apply the appropriate treatment to the landscape based on the site-specific condition. This is the rationale behind having the implementation plan as part of the EIS. Therefore, the resource specialists will analyze the most inclusive array of treatments that could occur at springs. This includes assuming that each spring will receive mechanical treatment, noxious weed treatment, prescribed fire, and fencing. Design features for Bebb's willow (a Coconino NF Forest Service sensitive species and a rare species on both forests) include: (1) Survey springs and channels slated for restoration for Bebb's willow before implementation of restoration projects and identify locations. Inform the forest botanist if new locations are found and mitigate effects to plants and populations to protect Bebb's willow; (2) Review various sites such as spring restoration for opportunities to introduce and restore Bebb's willow to supplement existing locations on the forest and introduce young plants into areas where plants are decadent and dying to aid in restoring Bebb's willow; (3) Bebb's willow stands may be enhanced by using cuttings, planting locally cultivated plants, and fencing existing or newly planted willows. Manual grubbing of grasses may be used to increase the likelihood of planting success; and (4) Fire lines will be placed around Bebb's willows and dead branches within the clumps will be removed before prescribed burning adjacent areas to reduce the risk of fire impacting willows.

Comment 42-22 Page 65 There are many well thought out ideas in the Large Tree Retention [when did it become Implementation?] Strategy. The LTRS should be fully incorporated into the proposed action. To tuck it away in an appendix and not truly incorporate it into the main document goes against the spirit of collaborative forest management, especially if the full stakeholder group has endorsed it.

Response: Please see response to comment 34-5.

Comment 41-23: Page 68 Wet meadow restoration should be included in the project objectives along with springs and ephemeral channels. Through spring restoration it may be possible to promote greater area of wet meadows.

Response: Wet meadow restoration is included within the stream channel restoration component and includes Sawmill Springs and Newman canyon stream reaches.

Comment 42-24: Page 74 While snowpack accumulation is mentioned here, there is no discussion in the rest of the document regarding how treatments can/will be designed to benefit snowpack. A more in depth discussion is needed in the EIS that describes the types of treatments (eg. UEA 25-40,UEA 40-55, savanna) that are conducive to promoting snowpack accumulation, how treatments will be laid out to assure appropriate forest openings to promote snowpack, and the total number of acres on which snowpack augmentation would be expected. Among other priorities, the Forest Service has in its mission an obligation to concern themselves with the generation of water supplies on forest lands. This is only right, since perhaps 90% of surface water in Arizona arises on forested lands and most of this from snow precipitation.

Response: The objective of this project is increased ecosystem function and landscape resiliency to natural disturbances. How treatments affect the soils and watershed resource will be disclosed in environmental consequences.

Comment 42-25: Please feel free to contact Sharon or I for any questions about out comments. We'd be happy to meet and discuss them in detail.

Response: Thank you for your comments.

DRAFT