Appendix D – Comments and Responses

Public involvement for this project is described in chapter 1 of the "Warm Fire Recovery Project Final Environmental Impact Statement." During the initial scoping period over 2,000 responses were received, many of which were electronically submitted form letters. Comments received during scoping were summarized in the draft environmental impact statement (DEIS) and a summary table is located in the project record.

Notice of availability of the "Warm Fire Recovery Project Draft Environmental Impact Statement" was sent to interested and affected parties on February 27, 2008. The DEIS documents were sent to those that requested them and were available electronically on the forest Web site. The notice of availability of the Warm Fire Recovery project DEIS was published in Volume 73, Number 41 of the Federal Register on February 29, 2008. The legal notice was published in the Arizona Sun on March 1, 2008. The 45-day comment period ended on April 14, 2008.

During the 45-day comment period for the Warm Fire Recovery Project DEIS, 24 responses were received from the following commenters. Some represent input from more than one entity. One comment letter included approximately 170 form postcards as an enclosure. Comments and responses are shown on the following pages; each commenter's letter is identified by the number shown below. A review of suggested literature was completed and is included in appendix B.

1—Justin, Veris, and Scott Schmidt
2—Brad Heppner
3—Edward Rowell
4—Tom and Carlyn Jervis
5—Karen Jensen
6—Bob Brister
7—Matthew Dunbar
8—Denise Hudson
9—Sheppard, Bill
10—Fredrick Wilburn
11—Heidi Alton
12—Ethan Aumack, Grand Canyon Trust
13—Dick Artley
14—Makenzie Selland
15—FWS, USDI, Regional Director
16—Nova Blazej, EPA Region IX
17—Jim Matson, Vermillion Services
18—Jim Koons
19—Ethan Aumack, Grand Canyon Trust
20—Taylor McKinnon, Sierra Club, Center for Biological Diversity, WildEarth Guardians
21—Andi Rogers, AZ Game and Fish Department
22—Stacy Hamburg, Grand Canyon Sierra Club
23—Timothy Begay, Navajo Nation
24—Patricia Sanderson Port, DOI Regional Environmental Officer

Comments and Responses – 45-day Comment Period

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1	1	Other	Thanks for including us in the information on the Warm Fire operation. It was a memorable time for us, especially Veris who talks fondly of the trip and treatment by the Forest Service people. It was nice to get a followup on the situation. All of the team did a good job – thanks.	Statement with no concern or statement affirming DEIS.
2	1	Other	Logging dead trees to help pay for reseeding a burned forest is the best way to go. I hope the crazy environmentalists don't stop this action.	Statement with no concern or statement affirming DEIS.
3	1	Alt. 1	No action (Alternative 1) is the most sensible plan by far. Recovery WILL take place without “management actions.” There is NO “necessity” for salvage harvest. Nature can take care of herself without our interfering to "recover economic value". Reforestation on a grass-roots level would be fine, but not at a commercial industrial-sized level.	Comment noted. The no action alternative is analyzed. Due to fire suppression activities over the last century, there was a buildup of fuels in the area burned with the Warm Fire. The fire burned at greater intensities than would have occurred under an unmanaged condition. Monitoring information from other previously burned areas was considered (USDA Forest Service 2008a).
3	2	Alt. 3	Alternative 3 seems the least harmful and most beneficial among the latter three plans. Winter activity to reduce impacts on soils is a good call, as is the planting of conifer regeneration and dropping salvage harvest in “certain” (how about all?) areas that are regenerating heavily to aspen. Where are the conifer seedlings coming from though? This isn't part of a gov't industrial experiment to test GMO fire-resistant trees, is it? As far fetched as this may sound, it does not seem beyond the scope of gov't and corporate industry capability. Again, let's leave nature to heal and manage herself.	Comment noted on alternative 3. Areas regenerating heavily to aspen will not have conifers planted due to competition with aspen. Appropriate local seed sources will be used for conifer regeneration efforts.
3	3	Alt. 4	Alternatives 4 and (lastly) 2 offer even fewer benefits overall. While retaining all snags in “designated” (by whom?) spotted owl habitat sounds like a good thing, alternative 4 makes no mention of	Snags would be designated by Forest Service (e.g. biologist or technicians following prescribed instructions). Effects of alternatives 2 and 4 are disclosed in the analysis.

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			preventing soil erosion through winter harvest, or of curtailing salvage activities in areas regenerating heavily to aspen. These last two alternatives would open and gouge more miles of road and perform additional fuels treatments on more acres than alternative 3.	
3	4	Alt. 1	The U.S. Forest Service is in position to do wonderful things so far as "managing" forests. This would include "sustainable" harvesting of certain dead or burned tree areas. However, the plans laid out in your letter - with the exception of alternative 1 (no action) - appear to do little overall to mitigate our heavy footprint on nature's habitat. Salvage harvesting on 23% of the total burned area may not seem like much, but the impact and benefit does not, on balance, sound all that wonderful.	Comment noted. Alternative 1 is analyzed and the effects anticipated with the action alternatives are disclosed in the analysis.
3	5		Yes, alternative 2, 3, or 4 would mean jobs and income for people, temporarily, but at what cost? Can you explain what "desired future conditions" and "visual concerns" are referring to? It isn't clear whether any of these three alternatives would change the pattern of our bumbling interference and harm to the natural environment. This may sound harsh, but it's going to take a lot of convincing.	Desired conditions are described in the forest plan, and reiterated in the "Purpose and Need" discussions in chapter 1 of the EIS. See the "Visual, Recreation and Roadess Resources" section in chapter 3. The desired condition for recreation and scenery in the pinyon-juniper and ponderosa pine vegetation types is to have these forests be within their historic range of variation including density of trees, presence of understory shrubs and forbs, and fire frequency. Multiple use and fire may be integrated as part of a healthy ecosystem (USDA Forest Service 2007c). Over a 5- to 40-year period the reforestation proposed would add positive line, form, color, and texture to the project area.
4	1	Alt. 3	We have received your letter and copy of the Draft EIS for the Warm Fire Recovery project. We are pleased to see that an additional action alternative (Alternative 3) which addresses concerns about salvage activities on erosion-prone soils has been included. However, it is apparent that the emphasis of this project	Comment in support of alternative 3 noted. Alternative1 is analyzed and the effects anticipated with the action alternatives are disclosed in the analysis.

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			is still primarily on salvage logging, albeit with a nod to management practices that should be standard operating procedure in any case.	
4	2	Recovery	Throughout the DEIS, assertions are made that have little support either in science or by reference in the DEIS. For example, it is stated that an objective is to obtain uneven-aged stand conditions. Yet to seed the area is to establish a cohort of trees that over time will produce exactly an even-aged stand. There is no reference to established scientific studies that show that recovery, even in high-burn-severity stands, proceeds more rapidly and with less erosion and weed infestation without salvage logging and seeding.	After a stand-replacing event, such as a fire, where no living trees remain, the initial reforestation effort would start out as even aged since the existing age classes are no longer present. Uneven-aged stand structure will develop over time. Planting efforts are designed to shorten the amount of time for re-establishment of conifer trees and is the first step toward desired uneven-aged stand conditions, which will take a century or more to achieve. Scientific studies of post-fire management activities and resulting conditions were considered during the analysis. For example Savage and Mast (2005) studied multiple ponderosa pine sites that had experienced stand-replacing crown fire in the late 20th century. Although the effects of large, stand-replacing wildfires are variable, several fires have led to long-term changes from forested systems. One of the potential vegetation pathways they determined was long term, self perpetuating grass or shrub fields with little or no conifer presence. The Wild Willy Fire on the north end of the district occurred in 1987, and resulted in grass/shrub fields as a result of a stand-replacing crown fire. Indications at this time is that conifer natural regeneration within the high severity burn areas within the WFR project is non-existent and that these areas that do not have substantial aspen sprouting are on a pathway to long-term, self perpetuating grass and brush fields. The reforestation project design is an effort to re-establish conifer presence and interrupt the vegetation pathway that has resulted from a stand-replacing crown fire.

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4	3	Rx Fire	Further, the DEIS specifically excludes from consideration the use of prescribed fire, although within a year there should be sufficient fine fuels available to carry low-intensity fire across the landscape. Such fires would do far more to promote uneven-aged stand conditions than will seeding to re-establish the forest. If there is in fact no fine fuel (DEIS p 34), the conditions under which even winter activities could proceed are not present.	The forest plan includes prescribed fire and fire use as management options for the National Forest System lands. The Warm Fire burned much of the surface fuels in the project area. It is anticipated it will take 5 to 10 years for adequate fine fuels to build up to carry a low-intensity fire across the landscape. The NKRD has many forested acres with fuel accumulations that are higher priority for prescribed fire activities than areas that have recently burned. Prescribed burning would set back vegetation recovery, as it would lethally scorch natural and planted vegetation. Planting of seedlings is proposed in the WFR project action alternatives to move the area toward the desired conifer forested conditions. Seeding is not proposed under the action alternatives.
4	4	Other	We urge you to more carefully assess the conditions on the ground in the project area and apply the best science and management practices to the development of alternatives.	Comment noted.
5	1	Other	The Bureau of Land Management (BLM) appreciates the opportunity to review and provide comments regarding the draft environmental impact statement for the Warm Fire Recovery project (ER 08/273). However, the BLM has no jurisdiction or authority with respect to the project, and we currently lack the staff load to submit comments at this time.	Statement with no concern.
6	1	Alt. 1	I am writing to urge the Forest Service to choose the No Action Alternative for the Warm Fire EIS. Salvage logging is ecologically destructive. I especially object to the logging of large diameter trees and the damage to the soils.	Comment noted. The no action alternative is analyzed.

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7	1	Other	I try and be active in environmental and ecological injustices as they come. Thankfully though, I see no problem with your salvage logging plans for the Kaibab Plateau near the North Rim of the Grand Canyon. I come from a family of loggers and I have personally seen the effects of clearing larger trees and letting the smaller recover after a severe fire. I do not, however, agree with the way logging is commonly executed.	Statement with no concern.
7	2	Reforesta-tion	Destructive equipment is often haphazardly driven over countless numbers of young saplings and a strict plan to conserve what isn't being removed is typically never drafted. This is why I come to you as a concerned student and as a fellow logger and ask that you please instruct the logging crew of the dangers and effects of their work in our beautiful forests. Every unnecessary step taken is another plant system destroyed.	Indications at this time are that conifer natural regeneration within the high severity burn areas within the WFR project is non-existent. There are many design features included in the WFR project that are intended to reduce disturbance of recovering vegetation such as: restricting skidders and other fuels treatment equipment to designated skid trails during non-winter harvest and fuels reduction activities, using existing skid trails where available, and by limiting compacted areas. Protection of the residual stand is part of the timber sale contract.
8	1	Alt. 1	I oppose the ecologically destructive salvage logging project in the area of the 2006 Warm Fire.	Comment noted. The no action alternative is analyzed.
9	1	Alt. 1	I am writing in support of Alternative 1, the no action alternative. The Forest Service should allow the Warm Fire region to recover naturally, rather than open this sensitive area to logging. Natural recovery is already occurring on the area.	Comment noted. The no action alternative is analyzed.
9	2	Soils	Salvage logging in the Warm Fire burned areas, especially those that have burned intensely, will contribute to greater soil erosion and compaction. Some severely burned trees could live for another 3 to 10 years and during that time they provide habitat for wildlife, a seed source for the next generation of trees, and can help stabilize the soil.	Soils effects are discussed in the analysis. Design features and use of best management practices have been incorporated to reduce impacts to soils. Indications at this time are that conifer natural regeneration within the high severity burn areas within the WFR project is non-existent (USDA Forest Service 2008a). There are

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				many design features included in the WFR project that are intended to reduce disturbance of recovering vegetation such as restricting skidders and other fuels treatment equipment to designated skid trails during non-winter harvest and fuels reduction activities, using existing skid trails where available, and by limiting compacted areas.
9	3	Wildlife	Salvage logging usually removes the best remaining habitat for wildlife, including the large snags that serve as nest trees for cavity nesting woodpeckers. Woodpeckers can eat up to 90 percent of the bark beetles in a tree and act as a natural control on the beetles that can proliferate after a fire.125	Effects to woodpeckers were considered and analyzed. Fires of this size and severity are not a natural part of this landscape. Because fires of this scale did not occur historically, we believe the mitigations provide far more snag habitat than historic burns produced. This project proposes to leave all snags in the non-treated areas (totaling about 30,000 acres) within the 40,000-acre wildfire area. Also, all snags will be retained in the entire 20,000-acre fire use area located adjacent to and north of the project area. The non-treated areas include: over ½ the overall high severity burn area; 100′ to either side of drainage channels (totaling about 2,350 acres); three to seven of the largest snags available retained per treated acre (the range varies by vegetation type and all values are above historic levels); whereas the MSO Recovery Plan defines “steep slopes” as >40 percent, this project will not treat slopes greater than 30 percent and most activity will occur on slopes 20 percent or less; and there is a 25m (82 feet) no-cut buffer along the interface of cutting units and contiguous green forest that is specific mitigation for hairy woodpeckers and associated cavity users. In addition, snags <14″ d.b.h will be retained onsite within harvest units; some may be felled for safety reasons, but would be retained onsite. Hazard tree removals are along roads only and occurring under a separate project to address safety concerns. Therefore, snags and the habitat they provide would be plentiful even with implementation of the preferred

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				alternative.
9	4	Soils	Logging in recently burned areas such as the Warm Fire area increases water runoff, speeds up topsoil erosion and compacts soil. Compacted soil and roots reduce the ability of trees and ground vegetation to regenerate and weakens trees that survived the fire.	The project will implement design features to reduce the effect of ground-based logging on the burned area. In order to minimize ground disturbance and compaction, ground-based equipment will be restricted to gentle slopes (<20 percent and for stretches of <30 percent where access is needed between normal (<20 percent slope) ground-based areas. Further, ground-based equipment will use previously impacted skid trails and non-system roads where available. These are areas that have already been impacted and continue to exhibit compaction. Ground-based equipment may work off of existing skid trails to make a single trip to access individual trees, and where "log forwarders," "feller-bunchers," or other more modern harvesting equipment is used.
10	1	Alt. 1	I oppose the Warm Fire logging project. Please let the area recover naturally. Thanks	Comment noted. The no action alternative is analyzed.
11	1	Alt. 1	I have read about the proposed "salvage logging" and I strongly believe it is not in the best interest of the forest, wildlife and tax payers. I frequently camp in the North Kaibab forest and help with trail maintenance on the Arizona Trail and would like to see nature take its own course in re-growth and restoration. Please let nature take its own course in the North Kaibab Forest and keep the impact of mankind at a minimum.	Comment noted. The no action alternative is analyzed.
12	1	Other	The Grand Canyon Trust respectfully requests that you extend the comment period for the Warm Fire Recovery Project Draft Environmental Impact Statement for 30 days, until May 15, 2008, to provide the greater public with adequate time to review and comment on the Draft Environmental Impact Statement for the Warm Fire Recovery Project. The Draft EIS was made available on February 29, 2008, and provides for a 45-day comment period, until Monday, April 14, 2008.	The Draft EIS was made available on February 29, 2008, and provided a 45-day comment period. The forest supervisor responded to this request. The comment period was not extended in order to avoid further delays in the analysis and decision and the time sensitive nature of this project due to product deterioration.

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			The requested 30-day extension is reasonable given the manner in which the decisionmaking has progressed to date. Scoping for this project began in December 2006. We provided the Forest Service with our scoping comments in January 2007. Since then, we have been awaiting release of the Draft EIS. We anticipated its release last summer and then in the fall. Under the circumstances, a short 30-day extension that permits the public the opportunity to fully review the hundreds of pages in the DEIS and provided informative and substantive comments on the proposed action is warranted. As you know, the proposed logging activities are located on lands upon which the trust holds grazing leases. We are uniquely situated in this respect and have gathered on-the-ground data that can ensure the Forest Service fully considers the best science available for the proposed action area. Finally, this is one of the largest proposed post-fire logging projects in the region in recent history. Given the scientific, ecological, and social complexities attending this decisionmaking process, we feel it is imperative that all citizens and stakeholders be given ample time to provide comments as they see fit. As this issue is of significant importance, I look forward to hearing from you as soon as possible. Thank you for your consideration of this request.	
13	1	Other	Are you proud of yourself? You are gaining national attention with your post-fire timber sale that is a certain forested ecosystem destroyer. One wonders what could possibly motivate a so-called land manager to so obviously trash the public land resource to provide opportunities for corporate America to profit. Are you hoping to be officially recognized by Rey & Kimbell who are the public land destroyers extraordinaire? Of course USDA Under Secretary Rey & USFS Chief Kimbell will be replaced shortly after January 2009 by whatever president we	Statements are outside the scope of the analysis. Comment noted. The no action alternative is analyzed.

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			have … of either party. Buttering-up to them now with your timber sale that should never have even been considered by anyone that cares for the public land with even minimal knowledge of forested ecosystems will surely put you on that same trajectory.	
13	2	Other, Soils	Mr. Armenta, you call your timber sale the Warm Fire Recovery project. The Forest Service was audited 5 years ago by the USDA Office of Inspector General. In their audit, they stated: "We concluded that commercial timber sales do not meet the criteria for forest restoration." Richard D. Long, U.S. Department of Agriculture Logging restores nothing … especially post-fire logging. I took a leave of absence from the agency and received a Masters of Forestry degree from Oregon State University in 1980. After that, I worked for the Forest Service until my retirement in 2003. With that education and 23 years of experience, I know what not to do to a forest. There is no law against lying to the public, Congress could not conceive of such a person of responsibility doing such a thing. But Armenta, that's exactly what you did when you named this tragic project the Warm Fire Recovery project. Post-fire logging is the antithesis of recovery. The Forest Service is fond of euphemizing their ecologically destructive logging projects. When I was a Forest Service employee, I was told that the Forest Service has an unwritten policy that the word "logging" would never be written in any document intended for public consumption. So what did the Forest Service do? They invented euphemisms for logging … "restoration," "mechanical treatment," and "vegetative rehabilitation." This represents the ultimate in public deception. It's so sad that Forest Service managers at all levels have such a	The WFR project is just one step in the recovery process for the affected area to initiate progress to forest plan desired conditions. The assessment completed post fire noted several items for management consideration in recovery of the fire area. The forest maintains the "Warm Fire Rehabilitation and Recovery Plan and Status Summary" on the forest Web site at http://www.fs.fed.us/r3/kai/projects/warm/ . This is the overall recovery plan for the area affected by the Warm Fire. Comment noted. The no action alternative is analyzed. See the project design featues and monitoring common to all action alternatives near the end of chapter 2. The project will implement project design features to reduce the effect of ground-based logging on the burned area. In order to minimize ground disturbance and compaction, ground-based equipment will be restricted to gentle slopes (<20 percent and for stretches of <30 percent where access is needed between normal (<20 percent slope) ground based areas. Skidders will be restricted to designated skid trails during non-winter harvest and fuels reduction activities and use of existing skid trails where available. Creating new skid trails and landings will be minimized, with the goal of limiting them to no more than 3 percent of the activity area. When designating skid trails, pre-existing skid trails and landings will be used to the greatest extent practicable. The total area affected by skid trails and landings would be limited to 10 percent of the activity area.

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			mindless preoccupation with allowing corporate America to log and road-up land that does not belong to them. This is the only rational explanation for Forest Service line officers lying to the public owners of this land about the REAL ecological effects of operating pieces of industrial equipment weighing 40,000 pounds on every square foot of the fragile forest soil. The Forest Service was audited 5 years ago by the USDA Office of Inspector General. In their audit, they stated: "We concluded that commercial timber sales do not meet the criteria for forest restoration." Richard D. Long, U.S. Department of Agriculture I have only one thing that I can say … the Forest Service must never be trusted to tell the public the truth!	
13	3	NEPA	The Haggarty and Fletcher Legal Opinions Mr. Armenta, you aren't as smart as you think. Below I have cited 2 court opinions that you currently violate. League of Wilderness Defenders et al. v. Elaine Marquis-Brong. In the United States District Court for the District of Oregon, Judge Ancer L. Haggerty, Civil No. 02-75-HA. April 18, 2003. <http://www.lclark.edu/org/nedc/objects/Timber_Basin_Order.pdf> The following are quotes from Judge Haggerty's opinion: "Defendants also contend that their reliance upon the Timber Basin EA was adequate in light of the existence of a prior Resources Management Plan ("RMP") and Environmental Impact Statement that was completed in 1985 for the John Day Resource Area (hereinafter referred to as the "John Day RMP" or the RMP). That management plan allocated the lands involved in the Timber Basin Project to be used for commercial forestry. Defendants assert that the EA in question was adequately "tiered" to this comprehensive EIS, and that therefore no other supplemental EIS ("SEIS") was	The Warm Fire Recovery project was analyzed in an environmental impact statement, in agreement with the two court opinions cited.

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			necessary." (pg 10-11 of opinion) "Tiering" refers to the coverage of general matters in broader environmental impact statements (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional program statements or site-specific statements) that incorporate by reference the general discussions and concentrate solely on the issues specific to the statement subsequently prepared. 40 C.F.R. § 1508.28. Defendants assert that the Timber Basin plan complies with the John Day RMP, since no cumulative impacts were found that exceeded those already identified and discussed in the 1985 plan." Blue Mountains Biodiversity Project et.al v. Blackwood, 161 F.3d 1208, 1211 (9th Cir.1998). Betty B. Fletcher, circuit Judge. Appeal from the United States District Court for the District of Oregon Ann Aiken, District Judge, Presiding. <http://www.ca9.uscourts.gov/ca9/newopinions.nsf/04485f8dcbd4e1ea882569520074e698/075514417bff6d1488256e5a007186d9?OpenDocument> The following quotes are from this Circuit Court opinion: "NEPA requires federal agencies to prepare an EIS for all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. §4332(2)(C). This requirement serves a dual role: 'It ensures that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts; it also guarantees that the relevant information will be made available to the larger audience that may also play a role in both the decisionmaking process and the implementation of that decision.' Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349 (1989). Stated differently, NEPA's purpose is to ensure that "the agency will not act on incomplete information, only to regret its decision after it is too late to correct." Marsh, 490 U.S. [360,] 371 [(1989)]. "In view of this purpose, an agency that has prepared an EIS	

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			cannot simply rest on the original document. The agency must be alert to new information that may alter the results of its original environmental analysis, and continue to take a "hard look at the environmental effects of [its] planned action, even after a proposal has received initial approval." Id. at 374 (citations and quotations omitted)."	
13	4	NEPA	The Actions that MUST (emphasis added) be taken to Comply with Judge Haggerty's Legal Opinion The following procedural steps described in Judge Haggerty's opinion must be followed by the BLM or USFS, or they are in clear violation of the NEPA for failing to take the required "hard look." 1) EAs and FEISs must disclose respected scientific evidence running contrary to the agency's final land management decision. I have assisted you. Appendix A contains quotes by mostly Ph.D. scientists in biological fields contained in 96 separate scientific documents. Note: I have the definition of "respected scientific evidence" used by the scientific community worldwide. It does not include the fact that disagreement with an agencies project exempts a scientist's findings and beliefs from the list of "respected scientific evidence" as the U.S.F.S so often tries to do. Do not try to exclude any scientific statements in Appendix A because you claim it is not "respected scientific evidence" the Judge will not accept such arrogance.	The quotes and available literature items were reviewed and considered in the analysis. A literature review has been completed and is included as an appendix to the EIS. Some literature cited refers to conditions or species not present in the WFR project area. Factors relevant have been considered and that literature has been considered in the analysis. Many of the cited literature items were included in the analysis. Additional information that has become available since the DEIS was published has also been reviewed and considered.
13	5	NEPA	2) EAs and FEISs that fail to address the differences between the agency's final estimate of the likely "ecological" impacts, and the view of others in the scientific community (including views expressed in the Beschta Report), have failed to take the "hard look" at post-fire issues and violate the NEPA. Note: You cannot just name drop one of these 96 documents and claim you "considered all opposing science." You must extract the	The quotes and available literature items were reviewed and considered in the analysis. A literature review has been completed and is included as an appendix to the EIS. Some literature cited refers to conditions or species not present in the WFR project area. Factors relevant have been considered. Many of the cited literature items were included in the analysis.

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			primary point being made by each scientist from each document and explain why you have chosen to reject their recommendations to forest managers. There is a significant difference between a real scientist and a dirt forester willing to trash any ecosystem to "get their cut out." When you claim to have considered a scientist's findings and conclusions (I have supplied over 90 in Appendix A) and choose to proceed with your project that violates the science, you must explain to the public why this was done.	
13	6	NEPA	3) EAs and FEISs that fail to address the Beschta Report "lends weight to [a plaintiff's] claim that the Forest Service did not take the requisite 'hard look' at the environmental consequences of post-fire logging instead of letting nature do the healing." The Ninth Circuit's teaching in Blackwood that follows the same reasoning and logic." Blackwood, 161 F.3d at 1213."	The Beschta Report was reviewed and considered for this analysis, along with the other quotes and available literature items. A literature review has been completed and is included as an appendix to the EIS. Some literature cited refers to conditions or species not present in the WFR project area. Factors relevant have been considered. Many of the cited literature items were included in the analysis.
13	7	NEPA	Your Purpose & Need (described on page 9 in Chapter 1 in the DEIS) is a carbon copy of thousands of similar illegitimate statements made by the Forest Service: "1. Recover the economic value from burned timber. Desired Condition: The "Kaibab National Forest Land and Resource Management Plan" includes the goal to "manage suitable timberland to provide a sustained level of timber outputs to support local dependent industries." The plan also includes a guideline for Ecosystem Management Area (EMA) 13 to "salvage stands, or parts thereof, that are severely damaged by dwarf mistletoe, insects, fires, or windthrow." The Forest Service has a memorandum of understanding (MOU) with the State of Utah to jointly identify priority restoration needs, build capacity to accomplish needed restoration projects, and to expand the use of stewardship contracting or other tools that encourage local employment in order to benefit management of the national forests and communities of the Central Colorado Plateau."	Statement of disagreement with the purpose and need. Comment noted. The no action alternative is analyzed.

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			Mr. Armenta, it is so unfortunate that you insist on destroying ecosystems for money, and lying to the public by characterizing it as a restorative action.	
13	8	NEPA	Just read the quotes by scientists in Appendix A. You will learn that the only recovery action that should be taken after a forest fire is to seed the area with native tree species (even if they have a low lumber value) and native grass for erosion control. There should never be any logging or road construction … even so-called temporary road. Unlike you Mr. Armenta, some land managers really care about the publicly owned land the public pays them to administer. These people know that the cost to the taxpayer to artificially replicate the ecosystem benefits provided by the dead and dying trees, and downed logs left after a fire will exceed the timber revenues many times over. These are the Rangers and Forest Supervisors who do not participate in post-fire logging. Per the League of Wilderness Defenders et al. v. Elaine Marquis-Brong, I will expect your final EIS to contain a discussion of each of the 90+ opposing science quotes from the scientific literature and why you chose to ignore it. I saw "each" of the 90+ opposing science quotes because the all provide land managers with reasons to never log a post-fire landscape.	The quotes and available literature items were reviewed and considered in the analysis. A literature review has been completed and is included as an appendix to the EIS. Some literature cited refers to conditions or species not present in the WFR project area. Factors relevant have been considered. Many of the cited literature items were included in the analysis.
13	9	Other	If this project goes to a final decision the log, I will definitely appeal. Since the USFS appeal process is a "kangaroo court" process where one agency employee rules on a decision of another agency employee against a big, bad member of the public who has the audacity to question a USFS Decision, I expect to "loose" most appeals. The primary reason I appeal is to establish standing to sue in a court of law where I will get an unbiased hearing of the issue. I will remind you that there are organizations like the Western Environmental Law Center, Wildlaw, Earthjustice, the Environmental Law Group (the University of Montana School of	Comment noted.

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			Law), Marten Law Group and Environmental Law Institute. I am not hesitant to use their services. Mr. Armenta, don't for a minute underestimate my motivation to see that the logging part of the Warm Fire Recovery Project is withdrawn.	
13	10	Other	I have one last non-rhetorical question for you Mr. Armenta. I expect an answer. How did you and Ranger Short manage to be promoted to positions of authority in the Forest Service when clearly, your knowledge of the natural functioning of forest ecosystems is barely that of a freshman in college?	Outside scope of analysis.
13	11	Other	Please send me an email when you withdraw this mindless project. If you still feel that it is the Forest Service's prime objective to service corporate America and decide not to withdraws the project, I'm sure this letter will assist the Sierra Club and the Center for Biological Diversity in their certain court action against you.	Commenter is on the mailing list for this project and will be notified of project status upon decision or other action.
13	12	NEPA	Appendix A Statements made by Hundreds of Unbiased Scientists describing the Positive Effects of Wildfire in a Forested Ecosystem and how these Effects are quickly Eliminated by Post-fire Salvage Logging	The quotes and available literature items were reviewed and considered in the analysis. A literature review has been completed and is included as an appendix to the EIS. Some literature cited refers to conditions or species not present in the WFR project area. Factors relevant have been considered. Many of the cited literature items were included in the analysis.
14	1	Alt. 1	I am a teacher who lives in Flagstaff, AZ, and I am writing to show my opposition to the Warm Fire logging project. This is an unjustified and ecologically destructive project. I ask the Forest Service to allow the Warm Fire region to recovery naturally. Salvage logging will harm the ecosystem by removing the large trees most needed for wildlife habitat and protection against erosion. The small trees and slash that are left behind make another fire more possible in an area where aspen regeneration is already happening, a stated goal of the Forest Service.	Comment noted. The no action alternative is analyzed.

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15	1	Other	The U.S. Department of the Interior, Office of Environmental Policy and Compliance, in their correspondence of March 13, 2009, instructed the U.S. Fish and Wildlife Service (Service) to prepare comment on the subject draft environmental impact statement. The attached letter expresses the position of the Service. We received no comments from other bureaus.	Statement with no concern or statement introducing concerns comments.
15	2	Wildlife MSO	Much of the acreage proposed for salvage logging is also Mexican spotted owl (Striz occidentalis lucid a) (MSO) habitat and designated critical habitat. Under the· proposed action, approximately 3,460 acres of MSO critical habitat would be salvage logged. Our primary concerns with the proposed action deal with potential effects of the project on recovery and resiliency of MSO habitat within the project area. Removal of large amounts of coarse woody material may inhibit, and lengthen time to recovery, of the habitat. We offer the following comments. Questions and clarifications	Although MSO habitat has been designated by the USFWS, no resident birds have ever been detected on the North Kaibab Ranger District. The forest habitat the USFWS considers "critical to the survival of the species" is an artifact of fire suppression over the last 100+ years. In the post-fire high severity burn landscape, forest habitat, much less MSO habitat, no longer exists onsite. Coarse woody material would be left at levels described in Brown, et al. (2003), for ponderosa pine and dry mixed conifer sites found on the Kaibab Plateau. The target is relevant to MSO and other wildlife in that the purpose for leaving coarse woody material is to maintain enough material on the forest floor (to achieve soil productivity and provide wildlife habitat. Levels retained for this project not only agree with levels recommended by Brown et al. (2003), but also exceed Region 3 and northern goshawk foraging habitat direction. One of the primary constituent elements related to forest structure in MSO habitat is "high volumes of fallen trees and other woody debris." However, "high volumes" is not defined or quantified. Other primary constituent elements of MSO critical habitat (such as canopy cover and a range of tree species, sizes and ages) would be recovered more quickly with the planting of seedlings in areas with low probability of achieving natural regeneration in the large area where conifer seed sources were lost. The burn severity of the Warm Fire is well outside historic

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				levels and the resulting amounts of coarse woody debris are beyond any naturally occurring event. Project design and mitigation should ensure and speed the recovery of eventual MSO habitat.
15	3	Vegetation	Page 11. The Existing Condition section here and several other sections where similar information is presented are confusing and potentially misleading. Care should be taken in using the terms "potentially forested" and "non-stocked" when describing cover types that existed prior to the fire. This section could be interpreted to mean that only 2 percent of the project area was or could be mixed conifer cover type. However, the amount of mixed conifer cover type in the project area was much greater than 2 percent prior to the Warm Fire. We recommend the EIS emphasize that a recovery goal is to restore the original extent of the mixed conifer cover type to mixed conifer.	By definition in the silviculture report for the WFR project: Cover types are named for the tree species that are presently (not potentially) dominant, using canopy cover as the measure of dominance. Cover type is based on the species type which has the majority of dominance in the uppermost layer of the site. In the case of mixed conifer, several cover types have been lumped together into a single cover type grouping and codominance is not necessarily implied. Potentially forested – areas that had 10 percent or greater tree canopy cover prior to the Warm Fire. Non-stocked – 0 to 9 percent tree canopy cover. This is broken down into two subsets: Non-stocked with 0 percent tree canopy cover (NS) and Non-stocked with 1 to 9 percent tree canopy cover (NS_S) Using the above definitions, a cover type analysis showed that currently, only 2% of the WFR project area is mixed conifer cover type. This figure does not imply anything about what cover types existed prior to the fire or what cover types can potentially develop in the future.
15	4	MSO	12. The DEIS suggests that 10-30 tons per acre is the desired fuel condition in the mixed conifer cover type. However, there is no explanation here or elsewhere in the DEIS why it would be the desired condition for MSO habitat and critical habitat. We recommend that the EIS describe and discuss how this particular fuel level will assist in achieving recovery of MSO habitat after the Warm Fire.	The 10 to 30 tons per acre level was erroneous and has been corrected between the draft and final EIS. The literature recommends coarse woody debris levels of 5 to 20 tons per acre (of material greater than 3" dia) in ponderosa pine sites and the dry mixed conifer sites found on the Kaibab Plateau (Brown, Reinhardt, Kramer 2003). This project specifies retaining at least 15 to 20 tons per

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				acre of CWD, erring on the high side of the recommended range for soil organic matter benefits. This target is not specifically directed solely at recovery of MSO habitat; rather it is based also on fire and fuels objectives of decreasing risk of future stand-replacing fires, and also providing for the benefits to soils and wildlife that coarse woody debris provides. The target is relevant to MSO and other wildlife in that the purpose for leaving ground fuels is to maintain enough material on the forest floor (CWD) to achieve soil productivity and provide wildlife habitat. Levels retained for this project agree with levels recommended by Brown et al. (2003) and exceed R3 and northern goshawk foraging habitat direction. One of the primary constituent elements related to forest structure in MSO habitat is "high volumes of fallen trees and other woody debris." "High volumes" is not defined or quantified.
15	5	Fuels, CWD	Page 12. Although 10-30 tons per acre are given as the desired fuel condition, the DEIS states that achieving those levels is not realistic given the scale of the fire and economic limitations. It also states it is desirable to make substantial progress toward these levels in stands that were lethally scorched. Given these statements, it is not clear what amount of important woody material will be left to aid in the stability and recovery of mixed conifer. We recommend the EIS clearly indicate how much woody material (in all categories and size classes) will be left in mixed conifer with an evaluation of how that amount is sufficient to lead to direct recovery of MSO habitat. Page 12. The DEIS states that future burn severity is not expected to be high until after 30 years due to accumulations of duff and decay of downed material fuels. Yet it also indicates that there is a need to make progress toward breaking up continuity of potential	The 10 to 30 tons per acre level for mixed conifer specified in the DEIS was erroneous and has been corrected between the DEIS and FEIS, and further clarified during consultation with the U.S. Fish and Wildlife Service. The recommended fuel conditions are 5 to 20 tons per acre in ponderosa pine sites and the dry mixed conifer sites found on the Kaibab Plateau (Brown, Reinhardt, Kramer 2003). The original 10-30 tons per acre figure is the recommended range in the literature for cooler, wetter habitats than those found in the Warm Fire Recovery project area. Regarding the DEIS statement "achieving those levels is not realistic given the scale of fire and economic limitations"; this is clarified as "Reducing fuel loads to these levels over extensive areas of the Warm Fire is not realistic given the scale of the fire and the high cost of non-

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			large fuels in areas that experienced moderate/high and high burn severity in order to increase the likelihood of safe and successful fire management efforts of future fires. Although it is not in the DEIS, the preliminary DEIS states that the areas should have a strategic spatial arrangement, and there is a need to provide areas for relatively safe and effective management of future fires. If future fire is largescale/high concern, we recommend the EIS include the strategic spatial arrangement and management was developed in earlier documents.	salvage fuel treatments." The following clarification has been added to note the spatial arrangement: Conditions within the project area would create a problem in the future for both fire suppression and prescribed fire operations. Heavy fuel loadings would be largely continuous with few natural breaks. Salvage operations would reduce fuel loadings primarily along ridges with existing road systems. From an operational perspective, having these ridges with reduced fuel loads would provide areas for relatively safe and effective management of future fires; this is where suppression and holding efforts would logically occur. The more ridges with reduced fuel loading throughout the project area would provide for more effective areas for future fire management.
15	6	Proposed Action	Page 13. The Wildlife section indicates that the criteria used to determine whether an area would be appropriate for treatment included reserving large blocks of snags and travel corridors for certain birds and other wildlife species that utilize snags and snag dominated habitat. These areas were combined with 100-foot buffers along drainages identified in the U.S. Geological Survey National Hydrography Dataset stream layer, and would provide habitat with no ground disturbance or snag removal within the project area. This analysis and its results are not presented in the DEIS, and we have not seen it in any other forum or context. We would like to receive the analyses and results, and recommend they be included in the EIS and/or the biological assessment.	The objective here is to reserve large blocks of snags and travel corridors for wildlife. These corridors were combined with 100-foot no treatment buffers along drainages. What this is saying is that in these areas, treatment is not proposed. The wildlife analysis considered the burned areas not treated, which includes the 100-foot buffer areas. The snags left within the 100-foot buffers will offer habitat for snag associated species. The analysis includes a discussion of snag associated species.
15	7	Soils	Page 13. The DEIS describes salvage on slopes in different ways. These descriptions are not clear to us, and we recommend clarifying the EIS as to the extent to which activities will occur on which slopes.	The project will implement design features to reduce the effect of ground-based logging on the burned area. In order to minimize ground disturbance and compaction, ground-based equipment will be restricted to gentle slopes (<20 percent and for stretches of <30 percent slopes where access is needed between normal (<20 percent slope)

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				ground based areas. Further, ground-based equipment will use previously impacted skid trails and non-system roads where available. These are areas that have already been impacted and continue to exhibit compaction.
15	8	Fuels	Page 14 and 20. The description of slash treatments and where they will occur in salvage-logged areas varies somewhat. How many acres of MSO habitat will receive which slash treatments?	Specific information on MSO habitat was provided to the Service during the consultation process.
15	9	Alt. 4	Page 25. In the description of Alternative 4, the DEIS states that salvage harvest would not occur in stands designated as MSO habitat. However, it also states that in stands that were previously mixed conifer, 5 to 7 snags per acre would be left. Because mixed conifer is MSO habitat, we do not believe that leaving 5 to 7 snags is equivalent to no salvage logging. We recommend the EIS clarify the description of this alternative.	The definition of mixed conifer in a silvicultural context is not the same as the definition of mixed conifer contained in the recovery plan for MSO. MSO habitat was classified, ground-verified and mapped cooperatively with the former NKRD biologist and USFWS field biologist. Alternative 4 was designed to leave the mixed conifer mapped by FS and USFWS biologists as designated MSO habitat untreated. The EIS language has been clarified as follows: "Within treatment areas that supported Mexican spotted owl habitat prefire ("MSO Recovery Plan" 1995), five to seven snags per acre will be retained in groups that provide for worker safety." This design feature would be applicable to alternatives 2 and 3, since the MSO stands were excluded from salvage treatments in alternative 4.
15	10	Soils	Page 28. We recommend clarifying the discussion about use of equipment and use of existing, designated, and new skid trails to better describe proposed uses and restrictions.	The project will implement design features to reduce the effect of ground-based logging on the burned area. In order to minimize ground disturbance and compaction, ground-based equipment will be restricted to gentle slopes (<20 percent) and for short stretches (e.g., up to 100 feet) where slopes are >20 percent and <30 percent and access is needed between the more gentle slopes. Further, ground-based equipment will use previously impacted skid trails where available. These are areas that have already been impacted and continue to exhibit compaction.

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15	11	Soils	Page 29. The DEIS states that operation of equipment will be restricted when soil conditions are such that accelerated soil erosion, excessive soil surface displacement, or excessive compaction would occur. We recommend describing those soil conditions and how this action will reduce or prevent accelerated soil erosion.	This refers to wet soil conditions. Saturated soil conditions means that site conditions are sufficiently wet that skidding operations damage soils either by displacement (e.g., wet soil moved), compaction, or displace road and landing surface materials in amounts sufficient to cause a turbidity increase in drainage facilities that discharge into a watercourse (intermittent or ephemeral channels). By avoiding use of equipment when the soils are saturated, soil erosion will be reduced and prevented. The best management practices for the use of this equipment is found and described in the EIS.
15	12	Wildlife	Page 32. Some conservation measures for the California condor are presented on this page in two different sections. Other different measures are presented in the California condor section in chapter 3. We recommend that all such measures for the condor be gathered in one place in the EIS so that a reader would be able to determine the complete set of measures. We also recommend development and implementation of a condor conservation measure to prevent/address vehicle fluid spills.	This is addressed in the biological assessment under project design features for wildlife. This has been incorporated in full into the EIS appendix A.
15	13	Wildlife CWD	Pages 32 and 35. The DEIS indicates that at least 7 large logs per acre will be left in MSO habitat. However, Table 5 indicates that some unknown number of downed logs will be left above forest plan direction. We recommend that the EIS clarify the amount of downed logs that will remain in MSO habitat after the proposed action.	This has been clarified in the EIS. Retaining 15 to 20 tons per acre of CWD is one of the project design features to provide for soil resources. Within treatment areas that supported mixed conifer conditions pre-fire, at least 7 down logs per acre will be retained. In other areas, at least 5 logs per acre will be retained.
15	14	Fuels Soil	Page 34. Item number 6 and the subsequent paragraph refer to removal of woody material to prevent fires. If future fires are of major concern in the recovery of the project area, then including scheduling of prescribed fire to address that concern should be made part of the proposed action. Many Forest Service projects	The concern with large woody fuels and future fire is the time the soils underneath the coarse woody debris would be exposed to high temperatures from the long-burning fuels. For more information on the damaging effects of soil heating refer to Monsanto and Agee, 2008.

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			include single-event and even a series of prescribed fires that are scheduled far into the future. Including provisions to conduct prescribed fire at the right time as an aspect of recovery of the project area seems more reasonable than removing woody material due to concern for fire that may occur far in the future. Woody material is important to stability and recovery of the area. We recommend the proposed action include provisions for prescribed fire as necessary to reduce fire threat rather than immediate removal of woody material that is necessary for recovery of the project area.	This project is one of the first steps in the overall recovery of the Warm Fire area. It will take years (e.g. 10 to 15 years) for the fine fuels to accumulate to an adequate level to use prescribed fire as an effective tool where a low intensity burn could be used. This analysis is designed to cover activities commencing in the next 5 years. The forest plan establishes prescribed fire as an appropriate management tool, and a separate analysis would be conducted in the future for a prescribed burn, if and when such treatments are considered ripe for decision. Adequate levels of woody debris necessary for the recovery of the project area would be maintained on site. Woody debris excess to recovery needs are proposed for removal in order to reduce the fire severity and soil heating effects from future wildfires and to allow the use of prescribed fire to maintain essential ecosystem processes and conditions in this fire-adapted ecosystem.
15	15	Soils	Page 35. Table 5 indicates that winter harvest on soils rated for severe erosion is "optional" for Alternative 2 (7,592 acres) and Alternative 4 (4,350 acres.) We recommend clarifying the intent. If winter harvest is part of those alternatives it should be so stated. If winter harvest is not part of those alternatives, the EIS should clearly state how many acres will be treated.	Harvest would not be restricted to non-winter periods under Alternatives 2 or 4, rather winter harvest would be optional for these two alternatives. The information in Table 5 was to show the difference between the alternatives and when winter harvest would be required on the severe erosion rated soils. The DEIS noted the acres of severe erosion rated soils for the action alternatives. This optional winter operating period is clarified in the EIS.
15	16	Fuels Soils CWD	Page 35. Although Table 5 indicates a certain minimum amount of coarse woody debris (CWD) will be left in the project area, the DEIS is not clear about the amount of woody material that will be left to promote recovery of MSO habitat. For example, the EIS states that most, if not all, of the woody material was consumed by the fire in mixed severity and high severity areas. One passage of	The 10-30 tons per acre level for mixed conifer specified in the DEIS was erroneous and has been corrected between the DEIS and FEIS, and further clarified with the commenter during consultation with the U.S. Fish and Wildlife Service. The recommended fuel conditions are 5 to 20 tons per acre in ponderosa pine sites and the dry mixed

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			the DEIS states that in forested ecosystems, a minimum of 10 to 15 tons per acre of down CWD should be managed for in the moderate to high burn severity areas. Another passage indicates that the desired fuel condition in mixed conifer is to have 10 to 30 tons of CWS per acre in mixed conifer. However, the DEIS states that achieving those levels over extensive areas is not realistic given the scale of the fire and economic limitation. It then states that it is desirable to make substantial progress toward these levels in stands that were lethally scorched. The DEIS also indicates that a minimum of 10-30 tons per acre of CWD greater than 3 inches in diameter should be left in the mixed conifer cover type when available. However, it also suggests that, where available, CWD left would approach the upper range of the above CWD requirements when activity units are located on high or moderate burn severity, or on highly erosive soils. Thus the DEIS is not clear regarding the amount of woody material that currently exists and the amount that will be left in the treatment areas. We recommend that the EIS clearly indicate what categories, size classes, and amounts of woody material are currently in the areas to be treated, as well as the amount that will actually be left.	conifer sites found on the Kaibab Plateau (Brown, Reinhardt, Kramer 2003). The original 10 to 30 tons per acre figure is the recommended range in the literature for cooler, wetter habitats than those found in the Warm Fire Recovery project area. As disclosed in the Warm Fire Assessment of the post-fire conditions (USDA Forest Service 2007c) most, if not all, of the down woody material was consumed in the mixed severity and high severity burned areas. The WFR project proposes salvage activities in the mixed severity and high severity burn areas. CWD is important to provide for soil protection and productivity. The project design features incorporated leaving the upper range of 15 to 20 tons per acre of CWD material to provide for soil resources. See also response to letter 15, comment 5 above.
15	17	NEPA	Page 41. Table 11 of the preliminary DEIS included a project type referred to as Multiple Fires. However, the similar Table 12 of the DEIS does not include that type. Why was that project type removed from Table 12?	The past, present and reasonably foreseeable table has been edited to note past fire suppression activities lead to increased forested stand densities as well as adding the past fires.
15	18	Reforesta-tion	Page 67. the DEIS states that the Kaibab National Forest is not willing to tolerate long regenerations periods in areas that have a low potential for natural regeneration and where there is reasonable potential of planting success. We agree and recommend that Douglas-fir of the mixed conifer cover type be planted in all areas where it is appropriate to do so to achieve the quickest direct recovery of the mixed conifer cover type.	Planting Assumptions - The intent is to reforest these sites approximating historical stocking levels and species composition. Douglas-fir was planted under the Warm planting project (separate analysis and decision signed September 20, 2007) in areas where previously planted seedlings were killed by the Warm Fire. Proposed Action – Planting: Preplanting surveys will occur

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				at the stand level and a regeneration prescription will be developed based on current stand conditions. The EIS clarifies the reforestation effort within designated MSO stands will promote the establishment of Douglas-fir seedlings based on current site conditions.
15	19	Reforesta-tion	Page 67. the DEIS states that the proposed action was designed to decrease the risk of salvage operations disturbing natural vegetation by salvaging only in areas that have a low probability of natural regeneration (i.e., salvage operations will occur within high and mixed-high fire mortality areas of the project area), limiting the salvage to fire-killed trees without green needles, restricting skidders and other fuels treatment equipment to designated skid trails during non-winter harvest and fuels reduction activities, using existing skid trails where available, and by limiting the operation of feller-bunchers to a sings pass (entry and exit) on any skid trail that is not located on a designated skid trail. However, there is no evaluation in the DEIS regarding how much these measures will reduce the impact of salvage operations on soils and existing vegetation. We recommend the EIS include an analysis of the expected beneficial effects of the measures designed to reduce impacts.	Recent field observations of the Warm Fire area noted an absence of conifer regeneration in the areas of moderate to high mortality where the seed sources were consumed by the fire (Fulé 2007; USDA Forest Service 2008a). This study reinforces observations made by Kaibab National Forest employees in the moderate to high mortality burned areas; conifer regeneration is absent (USDA Forest Service 2008a) The effects of the action alternatives was described on pages 90 through 93 of the DEIS.
15	20	Soils	Page 68-69. The DEIS identifies soil hydrology, soil stability, and nutrient cycling as three primary soil functions. We recommend that the EIS contain a comprehensive analysis and evaluation of how the proposed action is likely to affect each of those functions.	The effects of the action alternatives was described on pages 90 through 93 of the DEIS.
15	21	Roads	Page 71. The DEIS states that no new roads will be constructed, but that "existing closed roads will be opened and then closed for activities." However, it also states, "it is assumed that new skid road development will be very minimal. The few situations that may call for a new skid trail would require the use of slash mats and the new skid trail would be rehabilitated immediately after treatment. We recommend clarifying whether skid trails are or are not considered new roads, and what roads will be open or	Skid trails are not considered constructed roads, however, they are calculated in the compacted area from a soil resource standpoint. Skid trails are not to the standard of forest system roads. Appendix C of the DEIS and FEIS includes a road listing and map of roads proposed to be opened and reclosed. The alternative maps depict the roads to be used for project activities. The use of slash mats was considered during the

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			constructed.	development of the DEIS. However, the required cut to length system is not available in the area so this option was dropped from the EIS. Compacted areas from landings, skid trails and use of roads would be limited to 10 percent of a harvest unit to address soil resource concerns.
15	22	Soils	Page 74. Table 12 of the preliminary DEIS represented the erosion hazard rating for map unit symbol 623 as "severe." However, in the similar Table 20 of the DEIS, the rating is "moderate." Why was the rating changed?	The "severe" rating for soil map unit 623 on table 12 of the preliminary DEIS was incorrect so it was changed to match the forest terrestrial ecosystem survey rating for the DEIS and FEIS.
15	23	Soils	Page 76. The presentation of Table 21 does not seem to be in context. There does not seem to be a discussion of the contents of the table in the text. It is not clear what the table represents or what its purpose is. We recommend the table be explained in context of the EIS.	Table 21 has been updated and the following information added: Table 21 shows the four map units that comprise 96 percent of the soils potentially affected by project activities. Estimated ground cover numbers that are at or below ground cover tolerance numbers indicate soil map unit areas that are not meeting soil quality standards. Estimated current ground cover percentages were obtained from ground cover surveys completed in June 2006. Estimated ground cover at soil loss tolerance is taken from the TES. Unsatisfactory ratings indicate that soil quality standards are currently not being met, while impaired indicates that soil quality standards are being met, but that they are still in a "recovering" condition due to burn severity. Current conditions of the soils show that the moderately steep slopes within proposed treatment units are currently below the minimum tolerances for ground cover to meet soil quality standards.

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15	24	Soils	Page 81. The DEIS states that erosion rates after the fire would be approximately 18 tons per acre for the first year following the fire and would slowly return to natural background erosion rates within 3 years. We recommend quantifying the natural background erosion rates in tons per acre and the erosion rates after implementation of the proposed action.	The natural background erosion rates under forested stands are negligible due to the abundance of duff, litter, and coarse woody debris, as noted in the BAER report (USDA Forest Service 2006).
15	25	Soils	Page 89. The preliminary DEIS included a Table 16, which contained data indicating that the proposed action (Alternative 2) would by far have the highest number of acres at risk for accelerated erosion due to project activities. Table 16 is not included in the DEIS. We recommend that the EIS include Table 16 with appropriate discussion.	Comment noted. The comparison table in chapter 2 presented the total acres of soil disturbance and the acres of disturbance on severe erosion rated soils. Table 24 comparison of erosion rates and miles of road segments within stream buffer zones.
15	26	Soils	Page 90. The DEIS states that nutrient cycling would be in an improving condition for alternatives 2, 3, and 4 over approximately 9,114 acres, 5,756 acres, and 5,541 acres, respectively, due to the addition of small and large woody material. However, the description of the project area and the proposed action indicate that most, if not all, of the woody material on the ground was consumed, and the remaining standing woody material will be removed. What small and large woody material will be added to these acres?	Although the fire consumed most of the duff, litter, and fine woody material on the forest floor, much of the severe burn area and all of the moderate burn area have fire-killed trees that have needles and other fine fuels (twigs, small branches, tree tops). This material is important for nutrient recycling as these fine fuels are broken down and reincorporated into the forest floor. It is expected that up to 5 tons per acre (Brown, 2003) could be left in addition to the 5 to 20 tons per acre of CWD without causing an unmanageable increase in risk for future fire hazard. Please note that all standing woody material would not be removed in salvage activity units and that adequate levels of woody material would be retained onsite, as described in Chapter 2 of the EIS.
15	27	Botany Soils Hydrology	Pages 100, 152 and 153. We are aware that downstream erosion effects of the Warm Fire significantly impact the Trail Canyon drainage and Kaibab plains cactus habitat. However, we do not know if there are other similar drainages that are also being affected. We recommend that the EIS clearly state whether other drainages, such as North Canyon (and thus, Apache trout), are experiencing such effects. We also recommend the EIS indicate	Noted. The EIS includes a description of the down stream effects under the "Water" heading, subheading "Stream, Lakes, Wetlands, and Other Water Bodies." The North Canyon Wash watershed is not of this area. Impacts in Trail Canyon are from the wildland fire use event. The WFR project area is not a tributary to the North Canyon drainage.

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			whether the anticipated increased erosion because of the proposed action will further affect those drainages or any others. If such drainages will be affected, the EIS should state what measures will be taken to address such effects.	Effects to the plains cactus habitat were analyzed. No project activities would occur near any known populations of *Pediocactus paradinei* (Dr. Barbara Phillips, personal communication, July 21, 2008). No salvage treatments are proposed near any known occurrences of the cactus. Two stands slated for hand planting have potential to be near the Paradine Plains Cactus Conservation Assessment Area, but no known plants occur in this region of the conservation area. (Phillips, B.; forest botanist, personal communication, July 21, 2008).
15	28	Other	Page 127. Although it is missing from the DEIS, the preliminary DEIS stated that the district needs to undertake the effort to identify replacement MSO target/threshold habitat outside the Warm Fire area. We agree and recommend including this action in the EIS.	The preliminary DEIS, sent to the Service as a courtesy, was an internal draft that included some items that upon review were found not within the scope of this project analysis. Designating replacement MSO habitat outside of the project area is beyond the scope of the Warm Fire Recovery project analysis. Therefore, that language was not in the published DEIS.
15	29	NNIS	Page 153-159. We recommend that the EIS include a comprehensive section on the prevention, control, and monitoring actions that will be taken to address invasive species that will be facilitated by the proposed action.	Monitoring invasive weeds is a forest-wide monitoring item. Weed monitoring and control measures have been ongoing in the Warm Fire area since the 2006 fire event. Project design feature are included to reduce introduction during the project. Salvage harvest units would be monitored for NNIS as part of the district's weed management program for 2 years after treatment. Weed control measures will be taken as needed consistent with the "Final Environmental Impact Statement for Integrated Treatment of Noxious and Invasive Weeds on the Coconino, Kaibab, and Prescott National Forests" (USDA Forest Service 2005).
15	30	Vegetation	Pages 162-163. The DEIS states that, in the case of mixed conifer, several cover types have been lumped together into a single cover type grouping the co-dominance is not necessarily implied. To be relevant to any analyses regarding the MSO, the definition of	The definition of mixed conifer in a silvicultural context is not the same as the definition of mixed conifer contained in the recovery plan for MSO. The definition of mixed conifer as it is used silviculturally is contained in the silviculturist

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			mixed conifer needs to match that of the MSO Recovery Plan. We recommend that the EIS clarify that the definition of mixed conifer used does or will match that of the recovery plan.	report for this project (McCusker 2007).
15	31	Fuels	Pages 169-170. The DEIS states that most, if not all, of the down woody material that existed prior to the Warm Fire was completely consumed in the mixed high and high severity portion of the fire. However, Table 59 indicates that there is a current estimated amount of small woody fuel (less than 3 inches in diameter) somewhere in the project area. We recommend that the EIS explain this apparent contradiction. We also recommend that the EIS clarify the occurrence and distribution of the estimated amount of small woody fuel in relation to the treatment units.	This table displays the overall average of all project area acres. The mixed high and high severity portions are offset by the low severity portions where not all the material on the ground was consumed.
15	32	Fuels	Pages 172-184. Protecting the project area from future high severity fires is one of the reasons given for conducting the salvage logging. However, resistance to control ratings that are presented in Tables 66, 69, and 75 do not indicate much real difference between the project alternatives. Thus, from the information provided in these tables it appears that removal of fuel to prevent future high severe fires may not be needed.	The reduction of fuel loading is incremental in some locations. However, there would be some improvement in conditions as a result of the action alternatives. Additional information has been added to the EIS to demonstrate this better.
15	33	Fuels	Pages 175-184. The data in several of the tables in this portion of the DEIS are much different that the data in similar corresponding tables in the preliminary DEIS. What are the reason(s) for the differences?	The preliminary DEIS, sent to the Service as a courtesy, was an internal draft that was incomplete. It included some items that upon review were found to contain typos or preliminary numbers that were corrected in the published DEIS.
15	34	Grazing	Page 184. We do not understand what the statement "given management constraints and forest plan direction, grazing allotments and their management have no effect directly or indirectly on forest regeneration or structural stage development therefore has no cumulative effect" means. We recommend that this statement and the rationale be more full explained in the EIS. Pages 218-219. The DEIS states that portions of the burned area could continue to be deferred from livestock grazing in the event	Forest plan guidelines are to defer grazing for 2 years on burned areas. Grazing conditions are evaluated by the district range staff on an annual basis to access when conditions are appropriate. Livestock grazing would be avoided on planted areas until seedlings are established. Temporary fencing, range riders or deferring pasture areas may be used, and would be discussed with permittees during the annual operating instructions discussions

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			that activities that address soil and watershed issues or re-establishing native forage were to occur that could be negatively affected by grazing. In addition, the preliminary DEIS stated that "on top of deferring livestock from the fire area for at least two growing seasons, livestock would also need to be deferred from any plantations for two growing seasons after treatment." However the corresponding passage in the DEIS indicates that livestock may need to be deferred from plantations. The EIS should be clear whether livestock grazing will be deferred from the various treatment areas or under what conditions grazing would occur. To allow recovery we recommend that livestock be deferred from treatment areas for a minimum of 2 years after the treatments are completed.	between the district range staff and the permittee(s).
15	35	NNIS	Page 220. The DEIS states that control of isolated cheatgrass populations that are forming in the pinion-juniper areas of the Warm Fire project area would have a large impact on the success of the vegetation treatments. Without treatment, cheat grass and other potential noxious and invasive weeds can spread rapidly across a large part of the fire area. If control of cheat grass is interrelated to the success of the vegetative treatments, it would seem reasonable to develop and implement the control that is necessary. We recommend the EIS include the description of cheat grass control that will be implemented to ensure the greatest success of the proposed action.	See response to letter 15, comment 29 regarding NNIS.
15	36	NEPA	Appendix A, Soils and Water Best Management Practices, 24-Timber Management (appendix A is not paginated). Apparently, the actual physical activities that constitute the proposed action are felling, bucking, skidding, yarding, loading and hauling, site preparation, tree planting, and other activities associated with stand establishment. However, the first mention of these activities in the DEIS is in appendix A. They are neither mentioned nor described in the remainder of the DEIS. We recommend that a section be included in the EIS that describes the actions and activities that will occur on the ground because of the proposed action.	The soil and water best management practices are included to inform the public of the specific measures to be used during project implementation. The description of the proposed activities has been clarified in the EIS chapter 2 to better itemize the activities that would occur in the project.

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			Appendix A, Soil and Water Best Management Practices, 24-Timber Management (appendix A is not paginated). Were the many items that are described under 24 actually done? If so it would seem that much of the analysis and results are relevant to the proposed action, but they are not included in the DEIS. Is there another document that documents and presents how and which of those actions was accomplished? If such a document is available, we would like to review it.	
15	37	Other	There is no mention or discussion of the work we did with the North Kaibab Ranger District biologist in 2007 to develop project design elements to help reduce impacts of the proposed action to federally listed threatened and endangered species, as well as unlisted species. We understand you chose not to develop these elements as an alternative, but they formed part of the basis of alternative 4. However, we recommend the EIS include a description and discussion of those elements with an indication which of the design elements have and have not been included in the proposed action or other alternatives.	The forest completed consultation with the U.S. Fish and Wildlife Service and the EIS incorporates some of the design elements discussed with the previous North Kaibab Ranger District biologist (e.g. California condor measures). Upon interdisciplinary review, some design items developed in those early discussions with the district biologist were found to not meet mandatory safety requirements for working around snags, nor were they economically viable and, therefore, were not included.
15	38	Wildlife	Recommendations Based on our review of the proposed action as described in the DEIS, we recommend the following: 1. If salvage logging must occur in mixed conifer, significantly increase the amount of large CWD (snags and logs) that will be left in treated stands in order to promote recovery of key habitat components and primary constituent elements of MSO habitat and critical habitat.	Comment noted. Alternative 4 includes leaving all snags in designated MSO habitat that would be available for CWD. In treated designated MSO stands five to seven snags per acre and at least seven down logs per acre would remain onsite to provide for these key habitat components and primary constituent elements of MSO habitat and critical habitat. This will not affect MSO habitat, given that snags are not expected to last much beyond a decade and MSO habitat will not be present on many of these sites for centuries.
15	39	Reforesta-tion	2. Increase the amount of Douglas-fir that will be planted to speed recovery of MSO habitat.	The amount of Douglas-fir to be planted will be determined onsite, based on the site capability and potential for successful establishment. Planting Assumptions—The intent is to reforest these sites

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				approximating historical stocking levels and species composition. Proposed Action—Planting: Preplanting surveys will occur at the stand level and a regeneration prescription will be developed based on current stand conditions and desired conditions, including re-establishment of MSO habitat.
15	40	Other	3. Designate target/threshold MSO habitat outside of the project area to replace the target/threshold lost to the fire.	Designating additional MSO habitat outside of the project area is outside the scope of this project level analysis. This recommendation has been conveyed to the district ranger and wildlife biologist for consideration.
15	41	Future Actions	4. Because the Forest Service is concerned about fire that may occur at some point during the recovery of MSO habitat, include a project component to conduct prescribed fire at the appropriate points) in the recovery period.	It is not feasible to include future fire planning in the scope of this project, as that action would not be ripe for decision for at least a decade or more. Prescribed fire can be considered in the future as a separate planning effort.
15	42	NNIS	5. Develop and present the plans for prevention, monitoring, and control of invasive species that were referenced in the EIS.	See response to letter 15, comment 29.
15	43	Soils	6. Take immediate action to stop and repair the damage to Tail Canyon caused by the Warm Fire, including the damage downstream of the project area in Kaibab plains cactus habitat. The same action should be taken for any other significant drainage that is being similarly affected.	Noted. The fire left the landscape prone to erosion and this will remain an issue until vegetation stabilizes the area. The impacts from erosion and sediment transport from the fire area to areas downstream of the fire have the potential to occur depending on the severity and duration of thunderstorm precipitation events which pass over the fire area. No one can predict the timing or intensity of these events, but it is expected that as the watershed recovers, the magnitude of the erosion and sediment transport will decrease. Work has been above Trail Canyon to prevent continued impacts to Kaibab plains cactus and monitoring of the cactus will continue. The district continues to monitor the fire area condition. Soil stabilization work in the Trail Canyon drainage (which was affected by the fire use event)

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				was completed in 2008 and another stabilization project will be completed in 2009.
15	44	Soils	7. Include in the proposed action means to address and correct any other additional erosion damage that could result from the salvage logging.	The project includes design features (see chapter 2 of the EIS) intended to reduce or preclude additional erosion resulting from the proposed activities.
15	45	Grazing	8. Do not allow subsequent livestock grazing for at least 2 years on any stands treated with salvage logging or tree planting.	This is addressed by following forest plan guideline as noted in the analysis. Grazing conditions are evaluated by the district range staff on an annual basis to access when conditions are appropriate. Livestock grazing would be avoided on planted areas until seedlings are established.
15	46	Wildlife	9. Include a hazardous material spill plan in the conservation measures for California condor. Gather all of the California condor conservation measures together in one location in the documents so that it is clear what the forest proposes.	This has been done. The following design feature is included in the BA - If condors arrive and remain in or very near human activity areas, the following actions will be taken: … district wildlife staff will complete a site visit to ensure adequate cleanup measures; to prevent water contamination and potential condor poisoning, the district approved vehicle fluid leakage and spill plan will be adhered to. The plan will be reviewed by the district biologist for adequacy in addressing condors.
15	47	Wildlife	In late 2006 and early 2007, we met with the North Kaibab Ranger District biologist and developed several design features for the project that would help reduce but not eliminate adverse effects to the MSO, California condor, and Kaibab plains cactus. The design features were summarized in a February 28, 2007, document that we received by e-mail on March 2, 2007. It appears that many of those features were not incorporated into the proposed action. If salvage logging must occur in MSO habitat, we recommend that the design features be incorporated into the proposed action.	These discussions were the basis for developing alternative 4. Some of the design features were incorporated into the preferred alternative (alternative 2). Some of the design features are not feasible due to operability and safety concerns, and the need to comply with OSHA regulations.
15	48	NEPA, Wildlife	We also provided recommendations on the proposed action in a February 7, 2007, comment letter from the Arizona Ecological Services field supervisor to the North Kaibab district ranger. Many of the recommendations do not seem to be addressed or	The project was designed with long-term recovery of MSO habitat in mind. The project was specifically designed to limit the risk of salvage operations disturbing natural regeneration by salvaging only in areas that have a low

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			incorporated in the proposed action, as described in the DEIS. If salvage logging must occur in MSO habitat, we recommend that those recommendations (numbered below) be incorporated into the proposed action. 1. Some of the areas originally identified and mapped as MSO habitat that were affected by the Warm Fire should continue to be managed as MSO habitat, with long-term recovery of MSO habitat as an objective of any treatments that occur in those areas. In order to reduce further possible environmental consequences to MSO habitat, we recommend that key habitat components of MSO habitat and primary constituent elements of MSO critical should be retained to the greatest extent possible. Those components and elements include trees greater than 24 inches in diameter at breast height (dbh), other large trees (research indicates trees 19 inches or greater dbh should be maintained), large snags, large dead and down material, hardwoods, and canopy cover of 40 percent or more. We further recommend that any MSO habitat that receives salvage treatments be included in a comprehensive research and monitoring plan designed to determine effects to, and long-term recovery of, the areas.	probability of natural regeneration. Additionally, planting in areas that have a low probability of natural regeneration would speed up the recovery and re-establishment of the mixed conifer forest. Key habitat components and primary constituent elements will be retained. Where those components and elements are quantified, they will be retained at those levels. Where there is other quantifiable direction (e.g. goshawk guidelines or forest plan guidelines), those levels will be retained. Some of these components (e.g. 40 percent canopy cover) no longer exist in the proposed treatment areas; however, project implementation will speed the re-establishment of some of those elements. It should be noted that the designated MSO critical habitat that burned at moderate and high severity no longer serves as functional MSO habitat. There is currently a proposal to select 25 blocks of 10 acres each for paired research studies. The scientific studies will address effects of post-fire management activities on soils/watershed, weeds, fuels, (and perhaps wildlife) in areas treated and left untreated.
15	49	NNIS	2. We recommend that the Warm Fire should be closely monitored for the occurrence of invasive plant species. Such occurrences should be appropriately treated on a timely basis to prevent the establishment of invasive species. All fire lines and temporary roads used to fight the fire should be rehabilitated to minimize colonization by invasive species.	See response to letter 15 comment 29.
15	50	Reforesta-tion	3. Depending on methods, planting trees particularly in areas of high severity fire may be an appropriate action. Some research indicates that reseeding and replanting should be limited (Beschta et aI. 2004, Karr et aI. 2004) and that "native seed sources or colonists are almost always sufficient for early natural re-establishment of native species, so planting should be considered only when natural regeneration is unlikely." We recommend that the Forest Service review the discussion regarding seeding in	The areas selected for treatment are areas that have a low probability of natural regeneration given the distance of the seed sources. The Beschta et al. (2004) article cited here focuses on the Rocky Mountains, Pacific Northwest and Pacific coast forests. Ecologically, most of the focus of Beschta et al. has little relevance to Southwest ponderosa pine forest. The Warm Fire Restoration project is in accordance with the brief references the authors make to

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			Beschta et aI. 2004. We would like to be included in the coordination of tree planting in MSO habitat.	frequent fire ecosystems.
15	51	Soils	4. We recommend consideration of the following points (Beschta et aI. 2004, and Karr et al. 2004) when planning salvage activities so that ecological recovery is not impeded: a. No management activity should be undertaken that does not protect soil integrity. b. Actions that impede natural recovery of disturbed systems should not be undertaken. c. Salvage activities should maintain and enhance native species and natural recovery processes. In addition, new road construction and ground-based logging systems that will result in dragging trees across burned soils should be avoided.	These points were considered and the project was designed to address each of them.
15	52	Snags	5. Beschta et aI. 1995 recommended that salvage should leave at least 50 percent of standing dead trees in each diameter class. The 1995 report, Henjum et aI. 1994, and Hutto 2006, also recommend no harvest of live trees within burn perimeters, and no harvest of dead trees greater than 20 inches in diameter at breast height dbh or older than 150 years. We support these recommendations, and recommend using care when assessing tree mortality based on crown scorch. Stephens and Finney, 2000, found that the probability of conifer mortality is low when the percentage of crown scorch is less than 60 percent. For trees 19 inches or greater dbh, they determined that the probability of mortality of ponderosa pine and white fir was less than 40 percent when crown scorch was as high as 80 percent.	Comment noted regarding the Service's support of the Beschta et al. 1995 report. Project development made significant use of forest, fire, and fire recovery research from Southwest forest systems. Trees with green needles are not proposed for removal with this project.
15	53	Other	6. We recommend that the Forest Service work with us, the Arizona Game and Fish Department, the Rocky Mountain Research Station, and others to develop appropriate snag retention guidelines for the Warm Fire. Most snag-retention guidelines for	It should be noted that about 80 percent of the Warm Fire suppression area would have all snags retained. Of the approximately 20 percent of the burned area where salvage is proposed (alternative 2), the Forest Service has included

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			live forests are not appropriate for burned forests and we should develop guidelines that will better provide for ecological restoration and fire-dependent bird species (Hutto 2006). In addition to leaving more trees post-fire, the layout of these remaining trees should focus on leaving large groups versus individual trees. If the above recommendations cannot be incorporated to minimize effects to MSO habitat and speed recovery of key habitat components and primary constituent elements, we recommend implementation of alternative 4 instead of alternative 2.	guidelines for the retention of snags (forest plan, goshawk guidelines). This project is anticipated to exceed those guidelines in addition to adding measures to ensure an abundance of snags in all size classes. The project design includes leaving retention snags in groups rather than individuals within activity units. Very large groups of snags would be retained in the 80 percent of the fire area where no salvage is proposed.
15	54	Other	We also want to take this opportunity to recommend initiation of any necessary section 7 consultations that have not yet been conducted for the Warm Fire. For example, consultation on the wild land fire use and the wildfire/suppression portions of the Warm Fire have not yet been conducted.	The Section 7 consultation process for this project has been completed.
16	1	Other	We acknowledge the project design features to address salvage harvesting effects on soil compaction, erosion, water quality and wildlife. Of note are features to restrict salvage harvest to gentle slopes, no new road construction, limiting ground-based activities to old skid trails an landings, and the commitment to providing sufficient [coarse] woody debris (CWD) to increase much needed ground cover.	Statement with no concern or statement affirming DEIS.
16	2	NEPA	While there are positive aspects of the proposed action, we have rated the DEIS as Environmental Concerns – Insufficient Information (EC-2) (see enclosed "Summary of Rating Definitions") due to our concerns with the environmental impacts of the existing high-density road system and recreational use in the project area. We are specifically concerned with potential water resources and habitat impacts. We recommend the FEIS include separate sections describing the affected environment, existing conditions, and environmental consequences of the proposed project on the road system and recreation.	Comment noted. Transportation and recreation use are discussed together in the EIS since many of the area roads are used for recreational purposes, including dispersed use and driving for pleasure.

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16	3	Alt. 3	The DEIS states that most of the green vegetation, duff, litter, fine fuels, and CWD were consumed in the moderate to high burn severity areas leaving ash and surface rock fragments above the mineral soils surface. Erosion is a concern with heavy monsoon rains already transporting surface ash offsite. Due to the high density of roads and the erosion potential, we recommend selection of alternative 3 which would restrict ground-based skidding operations to over-snow or frozen soil conditions on areas classified as "sever erosion hazard"/ Winter over-snow salvage harvesting would significantly reduce the projected erosion rates and potential effects on soil, water resources, and down-slope sensitive resources. At a minimum, recommend maximizing the optional use of winter over-snow harvesting if another action alternative is selected.	Comment expresses alternative recommendation. Alternative 2 was identified as preferred over alternative 3 because limiting the project to winter over-snow conditions would significantly limit the operational time period. Timber product value deterioration rates increase with time, and only a fraction of the project could be implemented before there's no market value under a winter logging only scenario.
16	4	Other	We appreciate the opportunity to review this DEIS. When the FEIS is released for public review, please send one hard copy and one CD ROM to the addresses above (mail cold: CED-2).	Addressee is on the project mailing list.
17	1	Other	Thank you for the opportunity to continue to offer comments regarding restoration programs following the Warm Fire event of June 2006. Certainly and without question the latest causality of this applications of wildland-fire-use are the severely burned over landscapes of roughly 58,000 acres on the North Kaibab Ranger District awaiting restoration treatments since the last ember extinguished itself. Understandably one should question the Forest Service's lack of enthusiasm in carrying out timely NEPA analysis and restoration programs in each of the critical habitats and landscapes that were altered by fire. Unavoidably perhaps, this DEIS, 2 years after the Warm Fire sets the stage for haggling and grinding away about imagined causes of introduced damage and hand wringing over the removal of a some large dead and fire killed trees that could have been of real value to	Comment noted. Economic value of the timber has been updated to reflect estimated defect.

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			nearby small businesses and local economies if salvage harvested in 2007 and early in 2008.	
17	2	Other	Lack of timely treatments and restoration steps at this time for whatever reason is unacceptable. Particularity if we are to believe the assertions by certain entities advocating for critical habitats for Mexican spotted owls, Kaibab squirrels, northern goshawks, mule deer, migratory birds, bats, old growth and so on. The lack of an emphasis for implementing post-fire restoration measures by these same entities, if their assertions are to believed, now pales in the face of post-fire realities and is very disappointing. I now ask - just what was the problem previously when forest plans regulated timber harvest and other multiple uses, which more often than not resulted in vast ecological improvements and with little, if any, credible damage to forested ecosystems? It is likely that the Forest Service will continue to receive criticism for what it proposes to do, and not what it should be doing regarding restoration of the Warm Fire burned areas.	Comment noted regarding controversy associated with this project and the time needed to complete the analysis.
17	3	Other	The following statements are from the DEIS - Warm Fire Recovery Project electronic documents. • From the DEIS it is noteworthy that approximately 39,000 acres have fire-killed trees. 23,000 acres experienced moderate/high to high burn severity leaving few or no live large trees. • Future burn severity is expected to be high after 30 years due to accumulations of duff and decay of downed material fuels. • 50% of the Warm Fire Restoration project area is in a completely non-stocked condition • 16,026 acres of the area was classified as low burn severity. • 7,290 acres was moderate/high burn severity. • 15,780 acres was classified as high burn severity where “a large majority of the trees were killed with entire tree canopies totally consumed by intense heat and fire. Foliage, litter, and duff were	Statements relaying DEIS information.

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			completely consumed, and coarse downed woody debris was deeply charred or totally consumed." • The fire killed large areas of conifer stands and large portions of stands that were occupied by conifer trees now have few and poorly distributed seed sources. • Blew out large areas of designated critical habitat for Mexican spotted owls. • Destroyed 12 goshawk territories. • Natural conifer regeneration will take many decades	
17	4	NEPA Alterna-tives	Based on these representations and after reviewing each of the alternatives and the proposed action it appears than an unidentified institutional issue is liming the full disclosure of a full range of alternatives that should have been considered ranging from No Action to Total Restoration of the total 39,000 acres that were in that portion of the Warm Fire classified as escaped wildfire. A timely and full restoration alternative must be analyzed as to its feasibility for the long-term health of the 39,000 acres of forestlands and economic health of nearby dependent human communities. Alternative 2 is a step in that direction but misses the full opportunity.	The forest plan provides direction for overall management of the forest, including the Warm Fire area. Treatments on the areas burned with low intensity was not considered with this project since the areas that experienced low intensity burns currently have reduced fuel levels. Future use of prescribed fire in these areas will be addressed in future analyses. At this time, due to the reduced fuel levels in the low intensity burned areas, these areas were not considered a high priority for treatments. Other areas with high levels of tree mortality that are not included in alternative 2 have slope limits and other restrictions for resource protection. Alternative logging systems, such as helicopter, were determined to be uneconomical as described in chapter 2 "Alternatives Considered but Eliminated from Detailed Study."
17	5	Alt. 2 Salvage volume	The following discussion points are taken from the elements "noted" in the Warm Fire Recovery Project DEIS. My comments are bracketed [comments and critique] and are my advise and perspectives. Alternative 2 – Proposed action • "Salvage harvest fire-killed trees on 9,114 acres." – [Less than	The moderate to high mortality areas were considered for salvage while reducing potential impacts to soils on steeper slopes and providing habitat elements (e.g. snags) well distributed throughout the treated areas. Volume estimates in the DEIS were based on defect estimates from district personnel (Hidden Salvage). The Regional Office provided new information currently being used by the district to determine sale defect. Volume

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			23% of the total area with fire killed trees. This falls short of the opportunity to properly salvage and restore burned out forest ecosystems.].	estimates were adjusted in the EIS to reflect the increased timeline from when the volume estimates where originally made for the DEIS.
		Reforesta-tion	• "Remove 73.4 million board feet for timber products" – [this volume estimate probably doesn't comport with known North Kaibab RD stand stocking levels. For trees 14" and larger DBH this amount calls for removals of more than 8,000 mbf per acre. Salvage volumes are likely to be less than 50% of the listed volumes.]	Statement relaying DEIS information. Aspen planting is not warranted due to natural suckering. The areas selected for planting are areas that have a low probability of natural regeneration and a reasonable chance of planting survival based on existing (post-fire) conditions.
		Fuels	• "Conduct fuels treatments." - [No comment]	Statements on open roads and restoring structure and function of the forest noted DEIS information.
		Snags	• "Plant conifer seedlings." - [Planting conifer and aspen seedlings is critical to maintaining current forest types; the concern is that this fire has now altered the forest types and will likely result in a loss of the historic range of variation. Planting a total of only 9,980 acres falls short of striving for Forest Plan desired future condition.]	Statement relaying thoughts of future funding. Although climate change may be an issue in the future, funding for such projects will not happen if the projects are not planned. In order to receive funding, projects must be prepared and ready to go. The Warm Fire is expected to be funded and would move the area toward a more resilient state in terms of prescribed fire. Fire can occur as soon as fuels are again on the ground, which could be within a few years time.
			• "Open roads to meet the purpose and need." - [No comment]	
		Economics	• "Restore the structure and function of the forest." - [No comment]	
		Salvage volume	• "Move the area toward conditions that would allow fire to be used as a management tool in the future." – [Moving the area to a condition that would allow fire to be used as a management tool while desirable isn't likely to happen anytime soon, as climate change becomes more of a concern, forest acreage treatments for this is likely to be under funded by the Congress and Administration.]	Snags will fall over time with most anticipated to be on the ground within 20 years. The proposed action would leave adequate snags to provide for coarse woody debris over the treated acres while being responsive to the need of breaking up future large fuels.
		Soils	• "Ensure large blocks of snags and travel corridors for certain birds and other wildlife species that utilize snags and snag dominated habitat would be reserved." – [This has already occurred the question is will the new fire killed snags become firm and resistant to windfall.]	The forest recognizes and supports the existing memorandum of understanding (MOU 04-MU-11046000-060) between the USDA Forest Service, Southwestern and Intermountain Regions, and the State of Utah for building "the capacity to accomplish restoration projects" and encouraging "local employment in order to benefit the management of the national forests and communities of the Central Colorado Plateau and Great Basin."
		Salvage Soils	• Supporting the local community and economy. – [Under utilized	

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		Roads Vegetation Fuels Reforesta-tion Proposed Action Snags Reforesta-tion	community capacities for generating pay-as-you-go to the treasury for on the ground forest management projects have been MIA since 1995 and local communities are in need of reliable sources of raw material for risk taking and setting up value-added ventures to. Local economies are in need of reliable sources of raw material for doing business with the Forest Service, but hesitant to become reliant upon only sources of dead or salvage materials as a steady diet.] • "Stands considered for salvage include those with at least 3 to 4 MBF volume per acre." – [See comment on the second bullet point in this section.] • "Forest plan direction allows harvest on slopes under 40 percent." - [No comment] • "8,230 acres of the salvage treatments are on slopes between 0 and 20 percent." – [See comment on the first bullet point in this section.] • "1,510 acres of the salvage logging are on slopes between 20 and 30 percent." – [See comment on the first bullet point in this section.] • "250 acres of salvage logging are on slopes over 30 percent." – [See comment on the first bullet point in this section.] • "The transportation system required to access salvage operations is in place." - [No comment] • No new roads would be constructed with this project; however, approximately 95 miles of older, existing spur roads would need to be re-opened for salvage activities and then closed at completion of the project. - [No comment] • Most salvage activities would be conducted on areas that were dominated by ponderosa pine prior to the Warm Fire." - [No comment] • "Slash disposal would occur on all salvage logged areas and	See notation above regarding adjusted volume estimates in the EIS. Statement relaying DEIS information on. The moderate to high mortality areas were considered for salvage while reducing potential impacts to soils on steeper slopes and providing habitat elements (e.g. snags) well distributed throughout the treated areas. Statements relaying DEIS information on the transportation system. Statement relaying DEIS information regarding vegetation. Statement relaying DEIS information regarding fuels treatments. Statements relaying DEIS information regarding vegetation. Statement relaying DEIS information regarding the areas considered for proposed action. Trees with green needles would be left onsite to provide for seed sources and future snags and coarse woody debris. Additional activities may be planned in the project in the future to address other needs, if and when they are ripe for decision. The volume estimates have been adjusted in the EIS to reflect updated defect estimates. Statements relaying DEIS information regarding snags. The areas selected for planting are areas that have a low probability of natural regeneration and a reasonable chance

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			additional fuels treatments would be conducted on some salvage logged areas to protect future regeneration and move areas toward meeting scenic integrity objectives." - [No comment] • "Areas with adequate aspen regeneration were identified for aspen restoration opportunities." - [No comment] • "Planting conifer seedlings was identified for areas with high to moderate mortality that does not have a significant aspen response, are lacking a seed source, and where suitable soil conditions exist to ensure a reasonable chance of reforestation success." - [No comment] • "The salvage operations would occur within high and mixed-high fire mortality areas." - [No comment] • "Only fire-killed trees without green needles will be salvaged." – [How are trees with green needles that are likely to die to be treated? This entry should be utilized to deal with this situation since it is likely that there is now an abundance of snags. Are additional entries planned beyond this restoration project?] • "Salvage will be concentrated in trees 14 inches DBH and larger." – [After 2 or more years of delay in salvaging recoverable materials the dead trees are now impacted by blue stain, checks and cracks, brown rot and woodborer's, stay tuned.] • "In stands that were previously mixed conifer, five to seven snags per acre would be left; in other areas three to five snags per acre, targeting largest diameters in clusters would be left." - [No comment] • "Planting is also proposed to encourage mixed conifer species composition for the areas that are designated [_____] Mexican spotted owl habitat." – [critical] • "Planted acres are: ponderosa pine on 7,625 acres and mixed conifers on 2,353 acres." - [Planting conifer and aspen seedlings is critical to maintaining current forest types; the concern is that this fire has now altered the forest types and will likely result in a loss	of planting survival based on existing (post-fire) conditions. It is recognized that there is going to be high levels of variation across the landscape after the Warm Fire due to aspen sprouting, variable and sometime heavy natural regeneration adjacent to existing seed sources, variable planting densities and survival in areas identified for planting and slow (in some cases 100+ years) recolonization of conifers in harsher areas with no seed sources. Site-specific regeneration prescriptions will also be used to determine plantable areas. Aspen suckering has occurred, and will help maintain current forest types. Group planting will be used, but we will ensure adequate stocking levels based on site-specific prescriptions allowing for seedling mortality. We plan to plant more than 30 to 160 trees per acre. Statements relaying DEIS information regarding vegetation.

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			of the historic range of variation. Planting a total of only 9,980 acres falls short of planning to reach desired future condition.] • "Seedlings would be planted in groups with interspaces between each group at a rate ranging from 30 trees per acre to 160 trees per acre." - [No comment] • "Planting pattern to be based on the prefire stand structure with groups being concentrated adjacent to where legacy trees existed before the fire." - [No comment] • "Approximately 4,800 acres of previously conifer forest types are determined to have enough aspen present to restock the stand through sprouting and would be managed for aspen restoration, and artificial regeneration of conifers would not occur." - [No comment]	
17	6	Alt. 3	Alternative 3 – Winter Logging for Increased Soil Protection "Response to issues regarding salvage logging effects on soils and water quality." – [This issue is most aggravating and is causing the Forest Service to address them in the DEIS. Importation of offsite specifics from the literature regarding issues from the northwest is of little and real utility in handling site specific issues for the geology, soils and watersheds of the North Kaibab Ranger District. Non-specific site data from the North Kaibab is little more than a "Red Herring".] • "Modifying the proposed action to restrict ground-based skidding operations to snow covered or frozen soil conditions on areas classified as "severe erosion hazard"." – [Severe erosion concerns and only logging slopes of 0 to 30% is apparently another "Red Herring" - please utilize specific soils and ground information to substantiate any such assertions or requirements.] • "Ground-based skidding on soils with low to moderate erosion hazard would be restricted to existing roads and designated skid trails, using existing skid trails where possible." – [Either get real with the issue of erosion on the North Kaibab Plateau or forgo	Significant issues drive the alternatives evaluated in the EIS. The Kaibab National Forest follows regional soil quality standards as described in FSH 2509.18,2. Protecting soil productivity is a concern wherever management activities are implemented. Soil compaction, displacement, and loss of soil nutrients can cause long-term impacts to the soil's ability to produce vegetation. The project design features were developed in order to ensure that management activities do not substantially further impact post-fire soil condition.

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			mechanical treatments of any nature be they: fire lines, timber and fuels management or range work. Appeasement of special interests without verification is not reason enough to require non-applicable measures on the ground for the North Kaibab.	
17	7	Alt. 4 Other	Alternative 4 – Maintain Designated Mexican Spotted Owl Habitat • "Response to salvage logging effects to wildlife and wildlife habitat." – [This statement readily begs for a retort that says "what could be worse for wildlife and wildlife habitat than a fast moving crown fire that severely burns out 23,000 acres of forest ecosystem." Restoration of the 23,000 acres or more of critically and severely burned area and while only planning to treat 9,114 acres in alternative 2 - 5,756 acres in alternative 3 or 5,541 acres in alternative 4 seems to be a little disingenuous as viewed against the background of what actually occurred. A corollary question is how could the area be impacted by salvage and fuels treatments that are intended to reduce the specter of future and additional losses to drought wildfire?]	Comments from scoping and interagency discussion suggested leaving 50 percent of snags in various size classes distributed throughout the treated areas, in MSO habitat areas. This suggestion was reviewed and determined not to be practicable due to safety concerns of working around existing snags. Leaving all snags in the designated MSO habitat areas was determined to best address this suggestion while still allowing some actions to occur on other areas. The action alternatives would treat up to 23 percent of the project area, the balance of the area would provide for snags distributed across the project area.
			• "Modifying the proposed action to maintain all snags in stands designated Mexican spotted owl critical habitat developed it." - [No comment]	Statements relaying DEIS information.
		Salvage volume	• "Recover Economic Value from Burned Timber." - [No comment] • "Ground-based salvage logging of fire-killed trees on approximately 5,541 acres resulting in removal of approximately 42 MMBF of timber products. Salvage harvest would not occur in stands designated as Mexican critical spotted owl habitat." – [This volume estimate probably doesn't comport with known North Kaibab RD stand stocking levels. For trees 14″ and larger DBH this amount calls for removals of more than 8,000 mbf per acre. Salvage volumes are likely to be less than 50 percent of the listed volumes.]	Volume estimates in the DEIS were based on defect estimates from district personnel (Hidden Salvage). The Regional Office provided new information currently being used by the district to determine sale defect. Volume estimates were adjusted in the EIS to reflect the increased timeline from when the volume estimates where originally made for the DEIS. Statements relaying DEIS information.
		Proposed Action	• "The salvage operations would occur within high and mixed-high	Trees with green needles would be left onsite to provide for seed sources and future snags and coarse woody debris. Additional activities may be planned in the project in the future to address other needs, if and when they are ripe for

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			fire mortality areas of the project area." - [No comment] • "Only fire-killed trees without green needles will be salvaged. Salvage will be concentrated in trees 14 inches DBH and larger, but trees down to 9 inches DBH may be removed." – [How are trees with green needles that are likely to die to be treated? This entry should be utilized to deal with this situation since it is likely that there is now an abundance of snags. Are additional entries planned beyond this restoration project?] • "In stands that were previously mixed conifer, five to seven snags per acre would be left; in other areas three to five snags per acre, targeting largest diameters in clusters, would be left." - [No comment] • "The majority of salvage activities would occur on slopes under 20 percent, with short spans of activities on slopes under 30 percent." - [No comment] • "The transportation system required to access salvage operations is in place." - [No comment]	decision. Statements relaying DEIS information.
17	8	Other	In closing it is important to point out once more, that additional delay from this date increases the chances that restoration works may not occur. This potential and tragic situation is not only wasteful but also unnecessary. I wish you all good luck in your endeavors, but I worry about the Warm Fire's long-term impacts on the ecosystems of the North Kaibab Plateau.	Comment noted.
18	1	Other	I want to thank you folks for promptly sending me your DEIS. In general, the document is well done. A few thoughts occurred to me as I scanned the document. I have not read the DEIS, some 300+ pages, from cover to cover. As a result, some of my concerns, comments, and/or suggestions may have been covered. I have read in detail the DEIS Summary.	Comment noted.

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18	2	Alt. 1	Alternative No. 1, No Action, is unacceptable.	Comment noted.
18	3	Alt. 2	I favor Alternative No. 2.	Comment noted.
18	4	Alts. 3, 4	I do not believe that Alternatives No. 3 and No. 4 will, if implemented, result in optimum restoration benefits.	Comment noted.
18	5		CONCERNS I do have two general concerns. The Warm Fire occurred in June/July of 2006. The lag time between the fire and the implementation of needed restoration has had and will continue to have significant unintended consequences. Soil erosion (1) and degradation of the standing dead sawtimber (2) are two time sensitive items of concern.	Summary of concerns discussed in following comments.
18	6	Soils	Soil erosion (1), primarily from high intensity summer rainstorms, will, for several years, continue to degrade the 23,000 acres (59% of the 39,000 acres burned) classified as moderate/high and high burn severity. Appropriate on-the-ground actions, on a priority basis, need to be taken timely to minimize potential significant irreversible erosion impacts.	Comment noted. The action alternatives are designed to minimize potential significant irreversible erosion impacts.
18	7	Salvage	The dead standing sawtimber (2) will be degraded as a result of weather checking and flat-headed wood bores. The smaller the log – the greater the impact of weather checking. The timber sale contract log merchantability criteria need to recognize that fact. Flat-headed wood bores will reduce the value and/or increase the cost (dry kiln requirements) of lumber manufactured from sawlogs infested with wood bores. Expediting timber harvest will help solve both of these concerns. Getting logging slash on the ground as soon as possible will minimize the erosion potential. Timely timber harvest will minimize the wood bore problem.	Volume estimates in the DEIS were based on defect estimates from district personnel (Hidden Salvage). The F.S. Southwestern Regional Office provided new information currently being used by the district to determine sale defect. Volume estimates were adjusted in the EIS to reflect the increased timeline from when the volume estimates where originally made for the DEIS.

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18	8	Reforesta-tion	COMMENTS 1. REFORESTATION. See Chapter 1, PURPOSE OF AND NEED FOR ACTION, Purpose and Need for Action, item 2. Reforest burned conifer stands to move toward desired conditions. See attached WFR-DEIS page 11 (Attachment #1), page 29 (Att. #2), and page 51/52 (Att. #3). Note on page 11, Table 3 that about 25,500 acres of the project area are considered NON-STOCKED. Note on page 29, Table 4 that all action alternatives call for the planting of 9,978 acres (ADD TO PAGE 30?) Note on pages 51/52, Table 15 that 10,989 acres have been designated as "forestland with low probability of regeneration success." Please refer to page 29 (Att. #2), the last line of the first paragraph which reads in part "Additional sites may also be planted etc." Based upon the above information I would suggest that the criteria for designating potentially forested acres as "low probability of regeneration success" be defined in the glossary of terms. I would also recommend that a map showing the location of "low probability" acres be included in the final EIS. In all probability the inability to successfully plant the 10,989 acres will result in a conversion of those PP/Mixed conifer acres to a Vegetative Structural Stage 1 - Grass-forb/shrub for a century or two. A plan needs to be put in place to monitor the "low probability" acres.	By definition in the silviculture report for the WFR project: Potentially forested – areas that had 10 percent or greater tree canopy cover prior to the Warm Fire. Non-stocked – 0 to 9 percent tree canopy cover. This is broken down into two subsets - Non-stocked with 0 percent tree canopy cover (NS) and Non-stocked with 1 to 9 percent tree canopy cover (NS_S). The areas selected for planting are areas that have a low probability of natural regeneration and a reasonable chance of planting survival based on existing (post-fire) conditions. It is recognized that there is going to be high levels of variation across the landscape after the Warm Fire due to aspen sprouting, variable and sometime heavy natural regeneration adjacent to existing seed sources, variable planting densities and survival in areas identified for planting and slow (in some cases 100+ years) recolonization of conifers in harsher areas with no seed sources. The reforestation project design is an effort to re-establish conifer presence and interrupt the vegetation pathway that has resulted from a stand-replacing crown fire.
18	9	Economic	2. TIMBER HARVEST. Please refer to Attachments No. 4 (page v) and No. 5 (page xvii). Note on Att. #4, Support the local community and economy, which states that the project area contains approximately 200 million board feet of burned dead timber. Refer to Att. #5, which states the approximate volume of fire-killed trees that may be removed by alternative. The data indicates that between 20% and 40% of the dead timber may be harvested. I would suggest that you include a graph in the final EIS displaying this data. It appears that a lot of untreated acres (10,000+) will have a lot of tons per acre of down woody material that will present future wildfire control problems, regardless of the	Volume estimates in the DEIS were based on defect estimates from district personnel (Hidden Salvage). The Regional Office provided new information currently being used by the district to determine sale defect. Volume estimates were adjusted in the EIS to reflect the increased timeline from when the volume estimates where originally made for the DEIS. Alternative 2 would treat the most acres to address future large fuels concerns.

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			alternative selected. I believe that Alternative 2 would be the most effective means of minimizing probable future wildfire impacts on the project area.	
18	10	Alt. 3	3. WINTER LOGGING-ALTERNATIVE 3. Please refer to Attachment No. 6 (page 26), which is a map showing the location of the salvage areas (5,756 acres) requiring winter logging. A few thoughts: a. Log Haul–Arizona Highway 67 Closure. Arizona Highway 67 will probably be closed during the required winter logging (skidding?) time frame. Salvage areas that can only be hauled down AH 67 will have to be skidded and decked for hauling when AH 67 is open. All of the salvage areas in the southeast portion of the project area could be hauled off-highway during the winter. The bad news is that most truckloads of logs would have to be hauled uphill on ice/snow-packed roads. Significant snow plowing and sanding will be required to get the job done if the logs are hauled during the winter. b. Winter Logging Justification. Within the past forty (40) years about 25% (8,000 a.) of the 30,000 forested acres within the Warm Fire Recovery project area has been logged. Most of the timber sale contracts required the removal of trees from designated cutting units with slopes less than 40%. All log skidding was done with 0-7, 0-6, 0-5 Cats and/or rubber tired skidders. Uphill skidding was sometimes required. Following skidding, skid trails were water barred and seeded. Concentrations of slash were tractor piled and burned. If required, all log haul roads were water barred and all roadways within the sale area were seeded. To my knowledge no significant erosion, caused by log skidding, has occurred within the logged over acres within the Warm Fire Recovery project area. My guess is that eighty-five (85%) percent of the log skidding occurred when the soil was all but bone dry.	Soil displacement and compaction are still evident from past logging activities. Soil disturbance surveys indicated that most of the skid trails encountered still show some compaction, and vegetation growth within these skid trails is stunted as compared to nearby sites. Compaction that continues beyond 10 to 20 years is not a temporary effect and does not meet the intent of the regional soil quality standards.

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			SOIL COMPACTION. THERE ARE NO SKYHOOKS AVAILABLE FOR LOG SKIDDING. Tractor log skidding will cause soil compaction, which could be classified as an "UNAVOIDABLE TEMPORARY ADVERSE EFFECT." Fortunately, the potential adverse effects of compaction (erosion also) will be minimized by the implementation of the MANAGEMENT REQUIREMENTS spelled out in Appendix A - See Att. #7 (p. 251) and Att. #8 (p. 252). If soil compaction is a significant issue, I suggest the USFS check the soil conditions on the recently logged road right-of-ways of Arizona Highway 67 and U.S. 89A. The log skidding and slash disposal were accomplished on a variety of soil conditions. SKID TRAIL WATER BARRING. See item #7 on Att. No. 7. Water bars cannot be effectively installed when the skid trails are frozen or snow covered. If the goal is to minimize potential soil erosion from skid trails, winter logging should be minimized. SOIL STABILITY. Please refer to Attachment No. 9 (p. 83) Soil Stability. Note that analysis indicated that erosion rates for the first year after the fire would be about 18 tons per acre per year and, within three (3) years, return to natural background erosion rates, which, according to Attachment No. 10 (p. 91) would be about 3 tons per acre per year. Within 3 to 5 years the flashy nature of runoff would decrease as ground cover is re-established. Please refer to Attachment No. 11 (p. 92). Note that FSWEPP modeling indicates that ALTERNATIVE No. 2 erosion rates would be about 0.3 tons per acre per year for slopes 0 to 15 percent. For ALTERNATIVE NO. 3 (WINTER LOGGING) analyses indicate that erosion rates would be about 0.2 tons per acre per year for slopes 0 to 15 percent. I DO NOT BELIEVE THE 0.1 TONS PER ACRE PER YEAR DIFFERENCE IN EROSION RATES BETWEEN ALTERNATIVE NO. 2 AND ALTERNATIVE NO. 3 JUSTIFY WINTER LOGGING. The solution is simple—log only slopes 0-15 percent, plus short spans on slopes between 15 and 30	

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			percent. It is also important to remember that the Warm Fire occurred in 2006 and is not likely to be logged until 2009 (best case), four years after the fire, which means that the ground cover should have recovered to prefire conditions. WINTER LOGGING OPTION? By the time the Warm Fire fire-killed timber is available for logging it will be of marginal value. The current lumber market, thanks to sub-prime home loans, is in recession. My guess is that it will take two years to recover. Winter logging will significantly increase logging costs. I am afraid that if Alternative 3, WINTER LOGGING is offered, no one in his right mind would be interested, especially for that timber in the southeast portion of the project area.	
18		Soil/ Hydro	4. WATERSHED. I scanned all of the watershed pages referenced in the DEIS index. I have not found any statements regarding the impacts of snowmelt runoff timing. The Warm "USE" Fire and Wildfire burned a total of 58,000 acres, which is a pretty good sized black spot on the landscape. My guess is that a lot of wildlife and/or cattle will be looking for "tank" water that was normally available in the late spring and now it is long gone.	Comment noted: The EIS will be updated to include a discussion of changes to the timing of snowmelt and it's effects on water yield.
18		Other	5. SERVICE CONTRACT. Consideration should be given to dividing the Warm Fire Recovery Project into four to six Service Contracts. Potential Service Contractors should be contacted to determine if and what portion of the Project they may be interested in discussing.	The method of implementation of the actions will be addressed during project implementation.
18		NEPA	6. PUBLIC INVOLVEMENT. The review period for the Warm Fire Recovery Project ends on April 14, 2008. In the future I would suggest that the USFS hold a public meeting (s) two weeks prior to the close of the review period. A good Power Point presentation followed by a question and answer session would probably increase public input. Providing the public with the name and address, etc. of a "local" person that could be contacted regarding DEIS questions should be considered.	Comment noted. Future efforts will evaluate holding public meetings during review periods.

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			Remember, people do business with people. The Warm Fire DEIS contains about three hundred (300) pages with a lot of technical terminology. If you really want public input, you need to reach out and touch them. I would also suggest that the DEIS Summary include the ten+ (10+) key graphs that tells the public "WHAT'S HAPPENING."	
18		Other	7. WARM FIRE DEIS DOCUMENT EDITING. As I reviewed portions of the document, I ran across a few "what's this?" items, which I have randomly listed below. a. See page 257, add IRM to your list of Acronyms and to the Glossary. b. See page 48, add TPA to your list of Acronyms and to the Glossary. c. See page 196, Table 80, replace Alternative 5(?) data with Alternative 4 data. d. See page 98, last paragraph should read Prefire not Postfire (?), see Table 28. My guess is that you have already picked up most of these items. One other suggestion, the index in the DEIS needs significant improvement. As an example, go find info on snags within five minutes.	Comments noted. Typos have been corrected in the EIS and additions to the acronyms and glossary added to assist readers.
18		Other	Lois, I hope that my comments are meaningful and will contribute to getting the right things done on the ground. As you know, I am a forester (USU-62) by training, spent six years with the USFS (timber), spent twenty-eight years with Kaibab Industries (headquarter in Fredonia, AZ) managing forest road building, logging, and sawmill operations. I have a good understanding of what has happened on the North Kaibab RD over the past forty years. But, I have also been "out-of the-game" since 1996, over 10 years. I guess if you find one item in this document that provides "food for thought" it will have been worth the effort.	Comment noted.

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			I hope the Warm Use/Wildfire (58,000 acres -10% of the manageable acres on the NKRD) is not an omen (canary in the coal mine) of things to come.	
19	1	NEPA	Thank you for the opportunity to provide comments on the Warm Fire Recovery Draft Environmental Impact Statement. Please incorporate by reference our initial letter to the U.S. Forest Service dated October 9, 2006, and our comments on the proposed action dated January 25, 2007.	Comment noted. Prescoping comments were considered in the development of the proposed action. Other forest projects were also reviewed to avoid duplicative proposed actions.
19	2	Other	Given its ecological diversity, isolation, proximity to Grand Canyon National Park, critical wildlife habitat for numerous species, and relatively extensive remaining old growth, we feel the Kaibab Plateau should serve as a landscape within which science based collaborative approaches to ecologically appropriate fire management and forest restoration can be tested and demonstrated. Because mixed-intensity fires will continue to burn across the Plateau for years to come, defining ecologically appropriate post-fire rehabilitation strategies will be critically important in such a fire management and forest restoration context. Post-fire rehabilitation strategies should be focused on directing the disturbed ecosystems toward a system dominated by native trees, shrubs, forbs, and grasses in a spatial arrangement congruent with the ecosystems' natural range of variability, and resilient to recurring natural disturbance. Activities aimed at recovering economic value from burned timber, reforesting burned stands, and reducing fuels should occur if and only if they support such a rehabilitation trajectory in a broad ecological context.	The forest recognizes the fire recovery research opportunities present. Various research projects have been proposed to learn more about the effects from the fire, including studies to look at understory plant responses and a comparison of potential effects of salvage logging for local effects. Reforestation efforts are planned to restore native tree species, and stewardship salvage contracts that provide economic value will help offset tree planting costs. The broad ecological context includes ponderosa pine and mixed conifer stands that historically burned on the surface, and did not include thousands of acres of stand-replacing crown fires. Open stands of ponderosa pine are more resilient to disturbance, and can be set on this trajectory with the proposed action.
19	3	NEPA	While we fully appreciate the complexity of the issue of post-fire restoration (setting the context for the discussion about post-fire logging) and the difficult task you have in balancing ecological, economic, and social factors within this planning process, we are very concerned that the Forest Service has not fully contemplated the environmental effects of the alternatives presented, and has not conducted adequate analysis to ensure that the public at-large has	The interdisciplinary team considered scientific studies of post-fire management activities and resulting conditions relevant to the Kaibab Plateau were considered during the analysis. We are tasked with "use of the best science available" and relevant literature was cited in the various resource analyses. In addition, an effort was made to review past fires and salvage projects on the Kaibab National

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			information sufficient to fully engage in the NEPA process. The Ninth Circuit has noted, "the manner in which an agency addresses scientific evidence … can promote meaningful public involvement and advances the goals of NEPA: 'Agency regulations require that public information be of 'high quality' because '[a]ccurate scientific analysis … and public scrutiny are essential to implementing NEPA.'" Id. at 1066, citing Idaho Sporting Cong. v. Thomas, 137 F.3d 1146, 1151 (9th Cir. 1998) (citing 40 C.F.R. § 1500.1(b)). In this context, we are concerned that the Forest Service has not yet conducted a searching review of literature, performed an in-depth analysis of the scientific evidence both supporting and opposing salvage logging on the Warm Fire site, recognized the scientific uncertainty surrounding post-fire salvage logging in the southwestern United States, or provided a reasoned explanation of the Forest Service's approach to making an informed decision in the face of this uncertainty.	Forest. A full review provided in the EIS, appendix B.
19	4	Other	Our specific concerns are organized under the following headings: 1) The DEIS provides an incomplete set of alternatives 2) The DEIS inadequately portrays scientific complexities and/or conflicting scientific perspectives related to the potential ecological costs of post-fire logging. 3) The DEIS inadequately portrays scientific complexities and/or conflicting scientific perspectives related to the potential ecological benefits of post-fire logging. 4) Economic analysis within the DEIS is based on a series of unclear and/or flawed assumptions. 5) Analysis within the DEIS does not demonstrate that any of the action alternatives are sufficiently consistent with the Kaibab NF Forest Plan Our comments on these aspects of the DEIS follow.	Introduction to concerns addressed separately.

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19	5	NEPA Alterna-tives	1. The DEIS provides an incomplete set of alternatives Overall, we feel the alternatives offered in the DEIS serve as a starting point for discussing mid- to large-scale salvage logging as compared to no action, or natural regeneration as the case may be. Each of the action alternatives responds to the project's stated purpose and need, yet each follows a very similar suitability analysis protocol that assumes post-fire logging is necessary and appropriate except where exceptional circumstances dictate otherwise. The DEIS is missing a crucial alternative or set of alternatives that explicitly recognize(s) the need for active post-fire rehabilitation meeting the purpose and need stated for the project, but also recognize(s) the significant potential risks of post-fire logging. Two of the alternatives considered but not analyzed in the DEIS (referenced below) serve adequately in this fashion. We regret the agency's decision to not consider an alternative (the design criteria for which are included in appendix A) proposed by Grand Canyon Trust and reviewed by several additional environmental NGOs. We designed this alternative to meet the purpose and need described in the proposed action and reiterated in the Draft EIS. The alternative designated in a spatially explicit fashion hazard tree removal zones that could also be expanded to serve as future fire management containment boundaries and access points. We believe the alternative clearly met the recovery project's stated purpose and need by generating up to 17 million board feet of lumber, allowing natural regeneration and reforestation to occur across the burn area, and breaking up fuel continuity across the area in a strategic fashion. In addition, the alternative could have avoided some of the inevitable controversy surrounding larger-scale post-fire logging. The agency's failure to evaluate this alternative diminished the overall value of the planning process, restricting from consideration a viable and defensible alternative. Additionally, we question the rationale underlying the decision to not evaluate prescribed burning in the recovery planning process. Post-wildfire prescribed burning has been identified as a viable	In addition to alternatives 2, 3 and 4, six other alternatives were considered for this analysis as noted at the end of chapter 2. The district completed an analysis for hazard tree removals to address safety concerns as soon as possible. The alternative submitted by the Grand Canyon Trust was considered and upon review would include strips of treatment 40 to 50 feet wide on the outer edges of the areas included in the "Hazard Tree Removal Along Highways and Forest System Roads and Trails in the 2006 Warm Fire" project. The decision for the hazard removal project was signed July 19, 2007. Regarding the suggestion to consider prescribed burning in the Warm Fire Recovery in lieu of salvage logging. There are a few reasons why this option is not studied in detail in this EIS, as follows. First, a notable component of the large fuels that are currently standing snags would need to fall down and accumulate on the surface prior to conducting the prescribed fire. That process will take a decade or more for approximately half the fire-killed trees to fall, and 2 decades or more for the vast majority of snags to fall (Passovoy and Fule, 2006). The NEPA process is based on studying actions that are ripe for decision. Prescribed burning actions that are a decade or more away are not ripe for decision. Second, there is a need to establish conifer regeneration in the burned area via planting where seed sources have been lost. The conifer seedling planting would have to be delayed for a decade or 2 until after the prescribed fire treatments occurred, otherwise the burning would kill the conifer regeneration and waste the planting investment.

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			post-wildfire fuel reduction strategy in southwestern ponderosa pine forests that can minimize future re-burn potential without exposing severely burned areas to many of the ecological risks associated with post-fire logging (see, for example, Passovoy and Fule (2003) and others). According to the rationale offered in the DEIS, "future prescribed burning proposals would be analyzed when developed based on the site specific conditions present at the time." Much of the ecological rationale offered for post-fire logging within the DEIS is linked to modeled forest structure and fuel loading trajectories extending 20-50 years into the future - presented with some certainty. Given the weight these assumed trajectories play in the current DEIS, we feel analysis of prescribed burning effects 5-10 years into the future is more than appropriate. If prescribed burning truly cannot be considered in this effort, one must assume that consideration of post-wildfire prescribed burning as a viable alternative to post-fire logging cannot be considered in most if not all post-wildfire recovery planning efforts. We disagree with and cannot support this construct.	Third, if prescribed fire were to be used to reduce the large surface fuels a decade or two hence, soil heating effects and root damage to the recovered vegetation in the burned area would have undesirable effects (Monsanto and Agee, 2008), setting back the Warm Fire burned area recovery process.
19	6	Reforesta-tion	2. The DEIS inadequately portrays scientific complexities and/or conflicting scientific perspectives related to the potential ecological costs of post-fire logging. While we fully appreciate the difficult task at hand in balancing ecological, economic, and social factors within this planning process, we are very concerned that the DEIS insufficiently and/or inappropriately describes the need for and potential ecological effects (costs and benefits) of the proposed alternatives. We feel that analysis and presentation is skewed toward supporting larger-scale post-fire logging with insufficient scientific justification, and that insufficiently grounded presentation of the ecological costs and benefits will disallow meaningful consideration of the merits of each alternative by the general public. We include below a list of issues we feel merit additional analysis. 2.1. Soil damage	We have acknowledged that tractor logging will have an impact on vegetation. There are many design features included in the WFR project that are intended to reduce disturbance of recovering vegetation such as: restricting skidders and other fuels treatment equipment to designated skid trails during non-winter harvest and fuels reduction activities, using existing skid trails where available and by limiting the operation of feller-buncher to a single pass (entry and exit) on any skid trail that is not located on a designated skid trail. Refer to chapter 2 for additional requirements that will protect soils and vegetation. While it is important to consider the concepts presented in the papers you have cited, none of the studies that you cite occurred in the dry ponderosa pine forests of northern Arizona. Scientific studies of post-fire management activities and resulting conditions relevant to the Kaibab

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			Please see section 3.2 below. 2.2 Impacts to natural regeneration We are very concerned about the effect of salvage logging on natural regeneration and successional processes in the burn area. Smith and Wass (1980) have shown that skid trails formed during logging operations can negatively impact long-term productivity of trees growing directly on those skid trails. Sexton (1998) has shown that salvage logging may reduce vegetation biomass and overall plant species richness in the first years after logging. Kotliar et al. (2002), Roy (1956), and Grifantini et al. (1992) have shown that salvage logging can have pronounced negative effects on species that require early successional habitat – precisely the species land managers should avoid putting under additional stress (Beschta et al. 2004, Karr et al. 2004). For instance, impacting early successional N-fixers (such as Lupinus spp.) can "significantly affect a major pathway of nutrient replenishment in the postfire environment" (Beschta et al. 2004). Sexton (1998) found that in an Oregon ponderosa pine fire site, salvage logging impaired regeneration by negatively affecting microsite conditions. Logged sites were warmer, drier, and windier than unlogged sites (Sexton 1998). Even when salvage operations occurred over snow in an Oregon ponderosa pine forest, regenerating understory plants were significantly negatively affected (Sexton, 1998). Logging activities conducted beyond six months after a burn event may have the greatest detrimental effects by disrupting native plant colonization (Kolb, 2002). Beschta et al. (1995) argue that "there is no ecological need for the immediate intervention on the post-fire landscape….By acting quickly, we run the risk of creating new problems before we solve the old ones." We find several elements of the DEIS discussions surrounding effects of post-fire logging on natural regeneration particularly challenging to accept. In particular, the literature referenced in discussing the potential effects of post-fire logging on natural regeneration is sparse and incomplete. The DEIS discussion	Plateau were considered during the analysis. For example Savage and Mast (2005) studied multiple ponderosa pine sites within the southwestern U.S. that had experienced stand-replacing crown fire in the late 20th century. Although the effects of large, stand-replacing wildfires are variable, several fires have led to long-term changes from forested systems. One of the potential vegetation pathways they determined was long-term, self perpetuating grass or shrub fields with little or no conifer presence. Indications at this time is that conifer natural regeneration within the high severity burn areas within the WFR project is nonexistent (Raccaforte et al. 2008) and that these areas that do not have substantial aspen sprouting are on a pathway to long-term, self perpetuating grass and brush fields. The reforestation project design is an effort to re-establish conifer presence and interrupt the vegetation pathway that has resulted from a stand-replacing crown fire. See south and southwest aspects of the Wild Willy Fire area as an example of type conversion to brush 20 years after stand-replacing crown fire. Another comparative analysis relative to post-fire recovery within southwestern ponderosa pine ecosystems has become available since the release of the Warm Fire DEIS. Monitoring observations (USDA Forest Service 2008) document recent field observations of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. This paper evaluates the success of these areas in maintaining soil productivity and progress toward attainment of long-term desired conditions in terms of reforestation, growth rates, understory vegetation response, presence of coarse woody debris and snags, and an evaluation of the time to recovery to desired forest structure. The findings in this paper affirm the assumptions concerning vegetation recovery and

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			focuses only on two pieces of literature – Shatford et al. (2007) and Donato (2006). While we wouldn't expect an entirely exhaustive literature review, we feel additional literature should be reviewed to further clarify potential impacts of post-fire logging on natural regeneration processes. Specifically, we suggest reviewing and incorporating science that explores the effects of post-fire logging on early colonizers, as described in the paragraph above. Being one early colonizer of undeniable ecological importance, aspen deserves specific consideration in any literature reviews. We hope that such review will shed light on one metric of opaque origin within the DEIS. In several cases, an assumption is offered that predicts a 20% reduction in natural regeneration, based on predictions that salvage logging activities will affect 20% of any particular harvest units – a reduction considered "not enough to have a negative effect on natural regeneration." The origin of this assumption is unclear, and its following interpretation seems highly doubtful – at least without additional clarification.	logging effects that were made in designing the WFR project. Short-term impacts to soils and vegetation are acknowledged in the project analysis. The project analysis also considers the longer term negative impacts of excessive coarse woody debris to soils and vegetation, as documented by Brown, Reinhardt, and Kramer (2003) and Monsanto and Agee (2008). Both of these papers address warm dry forest types such as those in the ponderosa pine and dry mixed conifer forest types in the Warm Fire Recovery project area. Effects of the alternatives on non-native invasive species are addressed in chapter 3 of the EIS.
		NNIS	2.3 Non-native species invasions. Stakeholders invested in management of Kaibab Plateau forests and woodlands have long recognized the dire threat posed by cheatgrass in the region. Especially given the explosion of cheatgrass following the Bridger Complex fire in 1996, cheatgrass control has become one of the primary threats facing the Plateau, and a key issue of concern in post Warm Fire management planning. Threats related to post-fire cheatgrass invasion have been preliminarily quantified in landscape-scale spatially-explicit cheatgrass occurrence models recently developed by researchers at Northern Arizona University, working in collaboration with USGS staff and the Grand Canyon Trust. Given the well-known degradation caused by invasive nonnative species serious potential for post-fire cheatgrass spread in the Warm Fire area, in combination with studies indicating increased nonnative spread as a function of logging and road construction	The 1996 Bridger Fire burned over a large area of pinyon-juniper/sagebrush and ponderosa pine/pinyon-juniper ecotone (transitional) habitats on the west side of the Kaibab Plateau. The areas now dominated by cheatgrass in the Bridger Fire area are found below 6000′ in elevation, with climatic conditions similar to the Great Basin where cheatgrass colonization can cause permanent alterations to the ecosystem. The Warm Fire Recovery project is located at higher elevations in ponderosa pine and dry mixed conifer communities where the effects of cheatgrass are not as strong due to climatic conditions. A 2008 field review by Higgins of the Bridger Fire area that burned in the ponderosa pine type found common mullein present, not cheatgrass (USDA Forest Service, Kaibab NF, 2008). See also response to letter 15, comment 29 pertaining to NNIS. The EIS has been updated to include a discussion on the effects of reopening non-system roads for use in the harvest activities.

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			(CWWR 1996, Beschta et al. 2004, Greenberg et al. 1994, Sexton 1998), we are very concerned about potential action alternative effects and the analysis thereof. While the section describes an increased potential for cheatgrass invasion within the area as a function of logging activities, the document does not provide a sense of magnitude or significance associated with this invasion. It neither describes current distribution and abundance of cheatgrass in the area, nor differentiates between low and high risk areas (the differentiation of which is necessary given a significant elevation gradient spanning the project area). Furthermore, it does not relate road-building activities or road use inherent within action alternatives to cheatgrass spread potential in a quantitative or semi-quantitative fashion. While uncertainty will pervade this issue, as it will many others, analysis must take advantage of all reasonably available data to predict potential effects. In this vein, and because of the potential magnitude of the issue, we feel it should be requisite for an analysis of the effects of post-fire logging on cheatgrass distribution and abundance in the Bridger Complex fire to be included in effects analysis.	
		Roads	2.4 Effects of road building. Throughout the document, action alternative effects are described as having negligible effects as a result of road construction, due to stated intentions to use existing road networks. We feel this portrayal is disingenuous at best. Much of the road network in the Warm Fire area has not been maintained, and has been allowed to begin the slow process of restoration - and we applaud the Forest Service for this. "Re-opening" these functionally closed (or very lightly used) roads would likely have impacts that extend well beyond the neutral to positive effects described in the document. We feel a more complete and specific accounting of current road status in combination with a quantitative measure of re-opening impacts on soil, nonnative species distribution and abundance, and overall watershed characteristics is necessary for completion of the EIS.	

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19	7	Fuels	3. The DEIS inadequately portrays scientific complexities and/or conflicting scientific perspectives related to the potential ecological benefits of post-fire logging. 3.1 Post-fire fuel loading and re-burn potential Of central importance to the ecological justification provided for post-fire logging within the DEIS is the issue of post-fire fuel loading. As described on page 38 of the DEIS, no action will result in "above acceptable" CWD quantities that are roughly similar to CWD quantities predicted under action alternatives 2-4 five years post fire, 12-18% higher 20 years post fire, and 11-15% higher 40 years post fire. While we agree that management activities should be identified and implemented that account for unacceptable future fuel loading (that would, in theory, diminish the risk of large-scale intense fire throughout the burn area), we are concerned that such fuel loading and re-burn potential may not be nearly as significant an issue as is described in the DEIS. Especially given the inherent imprecision associated with FVS modeling, and the relatively small CWD differences predicted between no-action and action alternatives over time, we feel strongly that best available science needs to be (and has not yet been) brought to bear on this issue. Within the literature selectively referenced in the DEIS, empirical evidence shows only that fire hazard levels increase in the short-term as a function of post-fire logging (Donato et al. 2006, Thompson et al. 2007, McIver and Ottmar 2007). Two of the studies (Thompon et al. 2007 and McIver and Ottmar 2007) postulate that unlogged areas are likely to experience longer-term elevated fire hazard levels, though empirical evidence is not offered. The lack of empirical evidence for this postulation is reinforced by McIver and Starr (2000), who state in their comprehensive international literature review: "Following Beschta and others (1995) and Everett (1995), we found no studies documenting a reduction in fire intensity in a stand that had previously burned and then been logged." Scientific literature recently published in the Southwest (that has	The actions proposed in the Warm Fire project will reduce fuel loading and the associated fire behavior and effects in the long term. While the reduction in fuels and associated fire behavior is not substantial, it does result in a difference in effects. Please see additional information added to the EIS that helps to demonstrate the effects more clearly. An important concept in the fuel reduction purpose and need is that concerns about future fire severity in areas burned by the 2006 Warm Fire are directed more toward fires in future decades, rather than potential fires in the near term. Fire risk in the next decade or more, even with salvage logging, has been significantly reduced in the Warm Fire area due to the fire itself, which consumed most of the available fuel. In the absence of salvage, all fire-killed trees will eventually fall and accumulate on the soil surface. Future fuel loading (tons/acre) for the WFR project were predicted by modeling data obtained through stand exams. Estimates of surface fuels were made using FVS-FFE, Forest Vegetation Simulator with the Fire and Fuels Extension (Rheinhardt and Crookston 2003). The Fire and Fuels Extension to FVS simulates fuels dynamics and potential fire behavior over time and can be used to simulate and predict snag fall down rates, fuel loadings, parameters affecting fire behavior and fuels accumulation and decay. The decay and fall rates of snags and fuels within the model vary depending on species, size class, and the current conditions of snags and logs. The simulated breaking and falling snags are added to the surface fuels where further decay modeling occurs. Model results are used to highlight relative differences, not absolute conditions. The fall down rates and subsequent fuel loading are important to model and compare effects of removing fuels and not removing fuels in future stand

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			not been referenced in the DEIS), reinforces the broader body of scientific literature describing long-term fire hazard conditions as a function of passive versus active management. In a study of seven historic fires that burned around Flagstaff, Passavoy and Fule (2006) found that post-fire downed fine woody debris ranged from 2.7 to 10 mg/ha-1—well below the estimated range of 25.8 to 130.1 mg/ha-1 of slash in standard fire behavior models. The authors conclude that "the lower values at the seven wildfire sites imply that surface fire behavior at these sites would likely be substantially less intense than even that of a light logging slash fuel model." Furthermore, downed coarse woody debris (CWD) never exceeded the amounts (11.2 to 44.8 mg/ha-1) deemed appropriate for maintaining long-term forest productivity and wildlife habitat while minimizing fire hazard and soil heating in warm, dry forests. In fact, CWD measured within the most recent of the fires studied fell below the recommended thresholds. Recognizing the dearth of data (especially pertaining to southwestern forests) for this topic, Passavoy and Fule (2006) are measured in their recommendations. However, the authors do assert that "since the fuel loads in our study fell within the ranges that are recommended as being both beneficial to the ecology of the site and not a wildfire threat, salvage logging based on future fire hazard does not seem appropriate for these sites." The authors go on to offer two alternatives for managing post-fire fuels. Prescribed burning is suggested as a management technique for lowering fuel loads in areas where post-fire fuels are deemed excessive. Such burning can lower near-term fire hazard by reducing fine fuels, lower fire hazard associated with CWD in a controlled manner, and preserve soil intactness and wildlife habitat in the area treated. For those areas where fuel loading is not deemed excessive, the authors suggest passive management (no treatment). The authors conclude that, "there is no evidence that continued passive management of these sites would have negative effects."	management. Modeling predicted fuel loads both small and large over time. Modeling was based on individual stand characteristics and on whether the stand experienced high, moderate, or low intensity fire. Standing fuels were not included in this summary. The desired condition statement for the WFR project clearly states that the "surface fuel levels are such that effects from future fires are acceptable and the benefits to soil productivity and wildlife habitat can be realized. The future forest can be sustained with fire functioning as a key ecological process. Desired fuel conditions in ponderosa pine are 5 to 20 tons per acres in ponderosa pine sites and the dry mixed conifer sites (Brown, Reinhardt, and Kramer, 2003)." Surface fuel levels are such that the historic fire regime (relatively frequent and low to mixed fire intensity) and the associated ecological processes can be maintained." While Passavoy and Fulé found CWD to be within the acceptable range in their study area, modeling indicates that many of the stands within the WFR project will far exceed the acceptable range thus not meeting the desired condition for the project. Modeling also indicates that salvage harvest will reduce the accumulation of CWD resulting in a condition much closer to, if not within the desired range. It appears the Passavoy and Fulé averaged CWD fuel loads in the fires they examined, including burned grassland and pine savannah areas where little to no CWD exists. In addition, many of the ponderosa pine sites in the fires they examined were dominated by pine thickets (4 to 16″ d.b.h.), which are very different than the larger tree (12 to 40″ d.b.h.) dominated sites burned by the Warm Fire. The results of the fuel modeling done for the WFR project were similar to the findings reported by McIver and Ottmer (2007) in their study of post-fire logging in severely burned ponderosa pine forest in northeastern Oregon.

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			In sum, we realize that the potential for reduced long-term fire hazard and re-burn serves as one of the central arguments for post-fire logging, within the DEIS. We feel that this topic has been inadequately addressed. Specifically, models with very little to no empirical foundation have been used to generate assumptions regarding long-term fuel loading and fire hazard potential. Literature referenced within the document does not strongly support model assumptions, and results. Conflicting science concerning potential long-term fuel loading and fire hazard conditions has not been adequately considered. Within the context of empirically weak modeling efforts, and inadequate interpretation of existing literature, the DEIS does not adequately disclose scientific uncertainties associated with effects of post-fire logging on long-term fuel loading and fire hazard potential.	Recent research on long-term post-wildfire dynamics of coarse woody debris after salvage logging and implications for soil heating (Monsanto and Agee, 2008) has become available since the DEIS was issued and that research has been incorporated in the EIS. This research supports the concerns about fire effects in future decades.
19	8	Soils	3.2. Soil damage as a function of post-fire logging The DEIS, on pages 85-89, briefly describes potential effects of post-fire logging activities on soil hydrology characteristics, soil stability, and nutrient cycling. In effect the DEIS states, based in part on qualitative observations and in part on FSWEPP modeling, that postfire logging will improve soil hydrologic functioning, soil stability, and nutrient cycling as compared to no action. While empirical inputs and modeling parameters used to obtain modeling results are not evident in the document, it is apparent that external literature was referenced cursorily in the document, and largely discounted, based on a dearth of region specific literature. Given the preponderance of literature suggesting negative soil impacts associated with salvage logging, we are concerned that the conclusions drawn in the DEIS are incorrect and/or based on inadequate analysis and consideration of existing literature.1 Furthermore, of the ten pieces of literature referenced in the document, only one (Poff 1989) appears to support the contention that post-fire logging will reduce soil erosion rates. Finally, while we strongly support analysis of the area logged within the Bridger Complex burn area as a means of determining	The model inputs were disclosed in the assumptions section of the soil and hydrology report. A review of the literature was conducted and taken into consideration in the soils and hydrology analysis. Most of the significant research concerning the science of impacts to soil and water from salvage logging has been cited. However, much of the literature is not specific to the region or to the pertinent erosion processes of post-fire and/or salvage logging in northern Arizona. Some researchers, such as Robichaud (1996, 2000), McIvers (2003), and Klock (1975) have been more specific in describing the physical process of post-fire and salvage logging related erosion. Most of the cited research is relevant to Pacific Northwest ecosystems or to studies conducted where climate or topography is more pronounced. Further, erosion controls, as are prescribed for the Warm Fire Recovery project, were not as stringent: Klock (1975) indicates that advanced logging systems (circa 1975) appeared to cause minimal soil surface disturbance in all studies. The author found that less than 10 percent of the area yarded by

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			potential effects of such logging on soil erosion characteristics, we cannot draw reasonable conclusions from the photo and narrative describing a site visit to the burn area. We encourage additional quantitative analysis of the burn area if such analysis is to be used to characterize potential management action effects. 1 Literature referenced includes but is not limited to the following topics and authors: 1) Soil damage as a result of soil compaction (Kattleman 1996); 2) Increased runoff and erosion (Waters 1995, Karr et al. 2004, Klock 1975, Potts et al. 1985, Maser 1996); 3) Erosion as a function of roadbuilding (Megahan 1980, Beschta 1978, Swank et al. 1989, Megahan and Kidd 1972, Reid and Dunne 1984); 4) Catchment area effects (Mackay and Cornish 1982); 5) Slope effects (Chou et al. 1994a and b); 6) Skid trail effects (Van Lear et al. 1985); 7) Fire severity and soil characteristics (Megahan and Monitor 1975); Planting preparation (Walsh et al. 1995); and log retrieval systems (Klock 1975, Helvey et al. 1985)	modern logging system techniques had severe erosion disturbance compared with 16 to 30 percent with traditional yarding techniques. Further reviews of the Bridger Fire and others were conducted in 2008 (USDA Forest Service 2008a). The majority of the observations concur with the initial DEIS observations that the post-fire salvage logging on the Kaibab National Forest has not substantially affected soil productivity. All applicable BMPs to protect the soil resource have been incorporated on this project (see project design features near the end of chapter 2 of the EIS).
19	9	Reforesta-tion	3.3 Re-planting success as a function of post-fire logging. Despite the stated intention to restore forest conditions based on reference characteristics, it may be very difficult to do so. Across 10 historic (1948-1977) stand-replacing fires in New Mexico and Arizona studied by Savage and Mast (2005), all sites had not regained substantial mature overstory components after five decades. Five of the sites shifted to shrub or meadow-type ecosystems, and five regenerated to dense thickets, indicating a relatively low resilience to crown fire. Salvage logging occurred at all 10 sites. Passavoy and Fule (2006) studied a chronosequence of seven high intensity fires surrounding Flagstaff and found that regeneration was variable. One site had no regeneration after 4 years, another converted to an oak-dominated woodland, and another is currently densely stocked with aspen. Generally, the authors found that pine survivorship declined along a 27 year chronosequence, though the oldest site (the Radio Fire)	The areas selected for planting are areas that have a low probability of natural regeneration and a reasonable chance of planting survival based on existing (post-fire) conditions. It is recognized that there is going to be high levels of variation across the landscape after the Warm Fire due to aspen sprouting, variable and sometime heavy natural regeneration adjacent to existing seed sources, variable planting densities and survival in areas identified for planting and slow (in some cases 100+ years) recolonization of conifers in harsher areas with no seed sources. The reforestation project design is an effort to re-establish conifer presence and interrupt the vegetation pathway that has resulted from a stand-replacing crown fire. Recent monitoring of post-fire recovery (USDA Forest Service 2008a) documents field observations of four

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			had regained 79 pines/ha. Existing post-fire recovery evidence suggests that re-planting in some sites where replacement of coniferous species may be warranted, but also suggests that we should not be overly optimistic about replanting success rates. We do not see but feel it is necessary to see within the DEIS a strong evaluation of predicted re-planting success rates, based on historic re-planting activities that have occurred across the Kaibab Plateau.	ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. Tree growth of planted trees in the recovering areas were noted to be comparable to those in unburned areas on the Kaibab Plateau and stocking to be adequate in planted areas. Natural regeneration was virtually nonexistent except within 100 to 150 feet of seed sources. In the spring of 2008 conifer seedlings were planted on 1589 acres of circa 1990s regeneration harvest units (shelterwood/seed tree cuts) that were burned in the 2006 Warm Fire. Survival of those planted seedlings after the first growing season is over 90 percent, based on field sampling data (personal communication with Garry Domis, North Kaibab district silviculturist). Survival rates are not always this high, especially in years when the amount and timing of precipitation are poorer.
19	10	Economics	4. Economic analysis within the DEIS is based on a series of unclear and/or flawed assumptions. Recovering economic value from burned trees is recognized as an important consideration within the DEIS. We fully support the development of community-based industries utilizing forest products from appropriately-scaled forest restoration projects, and have been working to develop such industries in the greater Flagstaff area for the last decade. While we support the development of such industry, feel that it can be sustainable, and provide important economic benefits to local communities, we are highly doubtful that the proposed salvage operations will be beneficial in this manner. We strongly encourage investment in pro-active fire management and restoration and related community-based industries as a more sustainable means of maintaining long-term forest health and supporting local economies.	Volume estimates in the DEIS were based on defect estimates from district personnel (Hidden Salvage). The Regional Office provided new information currently being used by the district to determine sale defect. Volume estimates were adjusted in the EIS to reflect the increased timeline from when the volume estimates where originally made for the DEIS. Comments noted pertaining to the development of community based industries and fire management. Several items in the proposed action and project design features included in the action alternatives address soil resource concerns, specifically no new road construction, use of existing skid trails, limiting ground-based equipment use to slopes less than 20 percent were identified to limit compacted areas for soil resources.

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			Within the DEIS, and even through thorough review of Table 76 on page 191, we cannot find the origin of the 1% figure meant to indicate the overall significance of wood products utilization and forest restoration industries in the region's economy. Furthermore, we wonder if employment and labor income both exist at 1% levels, as there is no particular reason they should be equal, and no clear origin for either datum. We are unclear about the origin of the -$382,305 present net value figure stated on page 197, paragraph 3. It appears that the present net value for all project activities related to alternatives 1-4 are 0, -$2,513,549, $1,611,320, and $1,695,345, respectively. Present net value figures for post-fire logging activities alone are 0, -$2,034,359, -$1,190,377, and - $1,235,292. In either case, it is obvious that no action alone saves taxpayers millions of dollars as compared to any proposed post-fire logging proposals. This is consistent with broader reviews of salvage revenues vs. costs in remote harvest areas (see for example DellaSala et al. 2006). Language meant to describe qualifications to this analysis, specifically that describing net public benefits on page 197, is unclear and potentially misleading.	The information was obtained from IMPLAN tables. The wood products industry and forest restoration are included in other categories (e.g. retail and building supplies). The present net values for all project activities compare the incremental differences between alternatives. All action alternatives would result in a financially deficit sale. Non-market values, for example values for large fuels reduction and the reduced future soil heating effects, were not available.
19	11	NEPA Soils Wildlife Vegetation	5. Analysis within the DEIS does not demonstrate that any of the action alternatives are sufficiently consistent with the Kaibab NF Forest Plan Given incomplete and skewed analysis conducted thus far, we are not able to support any of the action alternatives proposed. We feel that such alternatives have not been shown to provide ecological or economic benefit that outweighs their costs. Furthermore, we feel that such alternatives do not appear to be consistent with the following elements of the Kaibab National Forest Plan: 1) "Carry out an ecological approach to multiple use resource management" (KNF Plan, p. 7); 2) "(Conserve) the ecosystem and human environment" (KNF	The WFR project follows Kaibab National Forest plan direction through the development and implementation of project design features and best management practices (1, 2, 3 & 6). The proposed salvage operation is designed and mitigated to achieve multiple-use management through ecological planning. The goal is ecosystem conservation with elements specific to benefiting the human environment. This is achieved through harvesting economic benefits while assuring neutral to beneficial impacts to soils, watershed values, wildlife, and scenic values. Design and mitigation developed to address these multiple goals include: no new roads; minimum distances between skid trails; use of existing skid trails, skidding over snow; extensive snag mitigation; artificial regeneration in areas

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			Plan, p. 7); 3) Emphasize watershed condition improvement (KNF Plan, p. 10); 4) Commit to "improving diversity, providing quality old-growth habitats, and composition of successional stages of vegetation and integrating desired wildlife habitat characteristics as a major consideration in the design of all vegetative treatments, whether they are for habitat improvement or for other purposes" (KNF Plan, p. 12); 5) "Improve wildlife habitats (on the North Kaibab R.D.) through expanding knowledge of species requirements, development of habitat quality and diversity, and the identification and protection of key habitats" (KNF Plan, p. 18); 6) "Maintain soil productivity and watershed condition" (KNF Plan, p. 19); 7) "Apply ecosystem approaches to manage for landscape diversity mimicking natural disturbance patterns, incorporating natural variation in stand conditions and retaining special features such as snags and large trees, utilizing appropriate fires, and retention of existing old growth in accordance with forest plan old-growth standards and guidelines (KNF Plan, p. 26); 8) "Encourage diversity of plant species in the overstory, understory, and ground cover" (KNF Plan, p. 42)	with little or no seed source; and continued natural regeneration of aspen. Activities will take place on less than half the area that burned severely. Research has shown that "natural recovery" of fires that burned in forests outside the historic range of variability, hence resulting in unnaturally high levels of fire severity, might not occur (Savage and Mast 2005, Strom and Fulé 2007). The proposed action will ensure recovery of coniferous forest by planting areas that could otherwise remain in a shrub dominated state. Reducing fuel loads increases the ability to let future fires safely burn or, if future fires are deemed too high a risk, maintain the potential to safely fight fire within the project area boundaries. The resulting forest is expected to recover faster, provide wildlife habitat that may not recover on its own, and create a landscape that benefits the human environment. (4) The silviculture report discloses the affects of all alternatives (no action and three action alternatives) to forest cover type and vegetative structural stages. Evaluation of alternatives for forest plan consistency within the silviculture report found alternatives 2, 3, and 4 to be consistent while alternative 1 was not. (5) Key habitats (MSO critical habitat) has been identified and mapped by the U.S. Fish and Wildlife Service. MSO target and threshold habitat has been identified and mapped collaboratively by Forest Service and U.S. Fish and Wildlife Service biologists. Development of habitat quality will be expedited on the acres that will be treated by planting seedlings in areas that have a low probability of regenerating naturally, while still retaining other habitat components such as standing and down dead wood. Other vegetative structure that provides wildlife habitat, such as shrubs, grasses and forbs will regenerate naturally.

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				(7) The silviculture report discloses the affects of all alternatives (no action and three action) to forest cover type and vegetative structural stages. Evaluation of alternatives for forest plan consistency within the silviculture report found alternatives 2, 3, and 4 to be consistent while alternative 1 was not. (8) The silviculture report discloses the affects of all alternatives (no action and three action) to forest cover type and vegetative structural stages. Evaluation of alternatives for forest plan consistency within the silviculture report found alternatives 2, 3, and 4 to be consistent while alternative 1 was not. Monitoring and evaluation relative to post-fire recovery within Southwestern ponderosa pine ecosystems has become available since the release of the Warm DEIS. Monitoring observations (USDA Forest Service 2008a) note conditions of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. This paper evaluates the success of these areas in maintaining soil productivity and progress toward attainment of long-term desired conditions in terms of reforestation, growth rates, understory vegetation response, presence of coarse woody debris and snags, and an evaluation of the time to recovery to desired forest structure. The findings in this paper confirm the assumptions concerning vegetation recovery and logging effects that were made in designing the WFR project.
19	12		Recognizing again the complexity of this issue, and the interest this issue has generated and will surely continue to generate across the region, we strongly encourage you to take a step back and evaluate an alternative that is based upon a science-based, restorative and long-term management strategy. Components of this strategy	The Warm Fire Recovery project is science-based, restorative, and provides a strategy for long-term recovery and sustainability. 1. Alternative 3 reduced the amount of salvage logging and

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			might include: 1) Dramatically reduced salvage operations. There may be significant value in identifying limited areas where the effects of salvage-based management can be comprehensively and rigorously compared to alternate management strategies (see #2 below), to inform the highest priority questions relating to the ongoing salvage debate. Such a research program should be identified collaboratively, and undergo a multi-stakeholder peer review process. Research areas should be minimal in spatial extent, and strategically placed to meet multiple research, restoration, and fire management objectives. 2) Identification of prescribed burning and passive management strategies that occur across a great majority of the burn area, and allow ecosystems to regain resilience, and move toward an envelope of natural range of variability. 3) Strategic tree replanting. Replanting should occur with local genotypes in areas with scarce natural seed sources, and where replanting will neither negatively impact natural regeneration processes, nor create unacceptable future fire hazard conditions. 4) Limited hazard tree removal along roads anticipated to be open following travel management planning in a manner that reduces short-term risk and long-term maintenance needs. Existing road densities across the project area are extremely high (see Appendix B). Across the suppression portion of the Warm Fire burn area (approximately 61 sq. miles), 417 miles of roads are shown to exist. Mean road density across this area is approximately 6.8 miles per square mile. Across the entire Coconino National Forest – in a much more highly populated region – mean road densities are less than 2.4 miles per square mile. Much of the road network in the Warm Fire area has not been maintained, and has been allowed to begin the slow process of restoration, and we applaud the Forest Service for this. "Re-opening" these functionally closed (or very lightly used) roads and using such roads for salvage operations would be entirely inappropriate and detrimental with	restricts salvage operations in high erosion severity areas to winter conditions. Alternative 4 reduced the amount of area considered for salvage logging to address maintaining higher levels of snags in MSO habitat. Alternative 1 addresses a no salvage logging scenario. The forest coordinated with various researchers and is working cooperatively to support research efforts. 2. An alternative to consider use of prescribed fire in 5 to 10 years on sites recently burned was considered as an alternative in the EIS and not given detailed study. Fine fuels to carry a prescribed burn are lacking across many of the project area acres. Over the next 5 to 10 years, the large diameter fire-killed trees would be difficult to ignite due to a lack of fine fuels to carry fire across the area. The North Kaibab Ranger District contains many overstocked acres that have not experienced recent fuels treatments or wildfire events to reduce surface fuels. Areas outside the Warm Fire area would be a higher priority for fuels treatments, such as thinning and prescribed burning. The forest plan provides direction for use of prescribed fire and future prescribed burning proposals would be analyzed when developed based on the site-specific conditions present at that time. The Forest Service does not conduct site-specific National Environmental Policy Act analyses 5 to 10 years in advance of proposed management action. The Warm Fire Recovery project would move the area burned in the Warm Fire toward the "natural range of variability" by reducing fuels to levels closer to historic condition and re-establishing conifer trees where they are not expected to return without planting. The reduced fuel loads will help provide for sustaining the recovering forest in the future in this fire-adapted ecosystem. 3. Planting operations will follow all FS reforestation handbook requirements including using local genotypes.

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			respect to desired watershed, wildlife habitat, and fire ignition conditions. We suggest that you identify a reasonable and conservative road network, and remove hazard trees along these roads for safety concerns. 5) Restoration-based small diameter tree removal in encroached meadows, and in unburned pockets and lightly burned areas within the burn perimeter where restoration needs dictate. Tree removal in these situations would effectively enhance public safety, restore ecological integrity, and (combined with limited hazard tree removal along a conservative road network) likely generate significant commercial timber volume. 6) Consideration of on-site "mastication" of burned trees across some portions of the burn area as a means of re-distributing nutrients to the forest floor and creating microsites for native species re-establishment. 7) Development and implementation of an invasive non-native species early detection, monitoring, and management plan. 8) Re-seeding with native species on a limited basis and only where necessary to prevent invasive non-native species colonization and establishment, and watershed protection. 9) Identification of science-based and cautious post-fire livestock management in the burn area that allows for meaningful and sufficient rehabilitation of edaphic and vegetation resiliency. 10) Development of and allocation of funds to a rigorous multi-stakeholder implementation and effectiveness program.	The areas selected for planting are areas that have a low probability of natural regeneration and a reasonable chance of planting survival based on existing (post fire) conditions. The reforestation project design is an effort to re-establish conifer presence and interrupt the vegetation pathway that has resulted from a stand-replacing crown fire. Modeling indicates that the stocking resulting from the planting effort will not result in an unacceptable fire hazard. Future desired trees per acre stocking guides for goshawk habitat areas follow recommendations adopted in the forest plan and the Kaibab NF implementation and interpretation guidelines. 4. An alternative was considered to limit hazard tree removal along roads anticipated to be opened following travel management planning. This was similar to and would nearly duplicate the "Hazard Tree Removal Along Highways and Forest System Roads and Trails in the 2006 Warm Fire" project. The decision for the hazard removal project was signed July 19, 2007. This proposal does not propose to change the existing road system. The forest is completing a roads analysis and motorized access travel management decision for the North Kaibab Ranger District (initiated in 2008) and will address the long-term management needs of the existing road network. Refer to "Scope of the Project, Analysis, and Decision Framework" in EIS chapter 1. 5. Treatment of green trees was considered. The North Kaibab Ranger District contains many overstocked acres that have not experienced recent fuels treatments or wildfire events to reduce surface fuels. Areas outside the Warm Fire area would be a higher priority for treatment of small diameter tree removals to address encroached meadows. The focus of this project is to address the areas that burned with moderate to high and high severity burns.

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				Refer to "Scope of the Project, Analysis, and Decision Framework" in EIS chapter 1. 6. Various fuels treatments were considered during the planning of the Warm Fire Recovery prescriptions. We agree that mastication can be an effective fuels treatment. However, cost, environmental impacts, feasibility, and effectiveness were all considerations given. Under these scenarios, mastication was not chosen as one of the treatments. 7. An invasive weed detection, control, and monitoring program is in place for the Warm Fire area. For more information refer to the "Warm Fire Rehabilitation and Recovery Plan and Status Summary," which is posted and updated on the the Kaibab NF Internet site. Also, refer to "Scope of the Project, Analysis, and Decision Framework" in EIS chapter 1. 8. Reseeding was completed to address immediate erosion hazard concerns in the Burned Area Emergency Response analysis and implementation. See response to letter 15, comment 29 regarding invasive species. Reseeding needs to be clearly identified. Native species also include ponderosa pine and Douglas-fir, but revegetation includes planting trees rather than aerial seeding. 9. Livestock grazing is reviewed in allotment management plans. Forage establishment will be reviewed annually and adjustments in grazing identified during the annual operating instructions discussions with permittees. 10. The Kaibab National Forest welcomes assistance from interested stakeholders with implementing projects and monitoring resource conditions. We particularly appreciate

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				all the assistance provided by the Grand Canyon Trust with resource management work on the North Kaibab District. The forest maintains the "Warm Fire Rehabilitation and Recovery Plan and Status Summary" on the forest Web site at http://www.fs.fed.us/r3/kai/projects/warm/ . This is the overall recovery plan for the area affected by the Warm Fire and includes the status of many different fire rehabilitation projects and programs in progress in the Warm Fire burned area.
19	13	Other	Lastly, we strongly recommend that the Kaibab National Forest support a collaborative, science-based landscape assessment process designed to identify long-term landscape-scale fire management and restoration priorities for the Kaibab Plateau. We can, through such an assessment, build the capacity to proceed with ambitious fire management and restoration initiatives across the Plateau for decades to come. Thank you for your consideration of our comments. We look forward to continuing to participate in the NEPA process. We also look forward to assisting substantially with on-the-ground ecologically appropriate rehabilitation activities over the coming years. Please feel free to contact me with any questions you might have about Grand Canyon Trust's comments on this DEIS.	The "Kaibab National Forest Land and Resource Management Plan" is currently undergoing revision and associated collaboration efforts are in progress. Identifying long-term landscape management priorities for the Kaibab Plateau goes beyond the WFR project boundary.
19	14	Alts. considered	Appendix A Design criteria for hazard tree removal / future fire management alternative	A chapter 2 note this alternative was considered and determined to nearly duplicate the existing roadside hazard tree removal project decision that was analyzed separately to address safety issues, and is currently being implemented. Due to this alternative's similarity to ongoing activities, it was not given detailed analysis in the Warm Fire Recovery EIS.
20	1	Other	Please accept these comments on the Warm Fire Recovery project on behalf of the Sierra Club's Grand Canyon Chapter, Center for Biological Diversity and WildEarth Guardians.	Statement introducing commenters.

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			The Sierra Club is America's oldest, largest and most influential grassroots environmental organization. Inspired by nature, the Sierra Club's more than 750,000 members—including 13,000 plus in Arizona as part of the Grand Canyon Chapter—work together to protect our communities and the planet. Many of our members enjoy recreation and educational experiences on the Kaibab National Forest including the area covered by the Warm Fire Recovery project. The Sierra Club submitted detailed comments on the Warm Fire Salvage Logging project during the public scoping period. The Center for Biological Diversity ("the Center") has more than 50 staff and over 40,000 members who have a strong interest and are concerned about the proper management of the Warm Fire Recovery project. The Center and its members also have a long-standing and well-established interest in the proper management of the Kaibab Plateau. The Center and its members regularly visit the Kaibab National Forest for a variety of recreational, scientific, and spiritual purposes, including the proposed project area, and the Center's interests would be harmed if this project proceeds as it is currently proposed. The Center has a long history of involvement on the Kaibab National Forest and submitted detailed comments on the Warm Fire Salvaging Logging project during the public comment period. WildEarth Guardians is a non-profit corporation with its principal office in Santa Fe, New Mexico. WildEarth Guardians has approximately 3,500 members, most of whom reside in New Mexico, Utah, and Arizona. Members of Forest Guardians frequently use and enjoy forest lands throughout the southwestern United States for recreational, aesthetic, and scientific activities. In pursuit of these activities, WildEarth Guardians members regularly observe and enjoy wildlife in its natural habitat. WildEarth Guardians and its members are committed to the protection of intact forest ecosystems throughout the Southwest. To achieve this protection, WildEarth Guardians works through administrative appeals, litigation, and otherwise to assure that all federal agencies	

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			fully comply with the provisions federal environmental laws, including NFMA, HFRA, and NEPA. WildEarth Guardians, its staff, and its members have a substantial interest in continuing to use the area where the Warm Fire project is planned and are adversely affected and aggrieved by the USFS's failure to protect the land and comply with the law. WildEarth Guardians (then known as Forest Guardians) submitted detailed comments on the Warm Fire Salvaging Logging project during the public comment period. Our comments below detail numerous problems that we've identified with the DEIS.	
20	2	NEPA Alt. 1	The Draft Environmental Impact Statement Warm Fire Salvage Project (DEIS) fails to adequately addresses the full range of reasonable alternatives. Nor does it adequately analyze or compare the potential environment impacts of these alternatives, including the overall cumulative impacts. The DEIS inappropriately exaggerates the beneficial impacts of salvage logging both ecologically and economically. The economic benefits are questionable, the ecological benefits are not substantiated, and both economic and ecological concerns can better be addressed via restoration. We believe that implementing post-fire salvage logging across this large of an area will have both long and short-term detrimental environmental impacts and that the proposed actions will result in a net loss to the American taxpayers. Because of that and the failure of the Forest Service to include an alternative which focuses on restoration and research, we can only support Alternative 1 – No Action, at this time. We continue to have concerns about this proposal that we do not believe were adequately addressed in the DEIS. Before focusing on the specific aspects of the DEIS, we want to reiterate our concerns. By logging these burned areas, especially those that have burned intensely, the Forest Service will be contributing to greater erosion and soil compaction. In addition, after a fire like this, it is difficult to determine which trees will survive and how long "dead" trees	Comment noted on alternative supported. The economic analysis has been updated to incorporate updated defect factors for the salvaged timber. The analysis acknowledges the costs of the entire proposed project would result in negative present net values. In addition to economic considerations, the analysis considered the long-term impacts to soils and the future fuel loading anticipated. Large trees that fall to the ground become large fuels that when burned, burn for a longer time exposing the soil beneath and around them to higher levels of heat for longer periods of time than smaller diameter material. Breaking up the future large fuel component is one of the purposes for the WFR project. Future fires would expose the soils beneath and directly around coarse woody debris to high heat for extended periods of time, exposing roots to lethal temperatures (Monsanto and Agee 2008). Monsanto and Agee (2008) noted lethal cover ranged up to 24.7 percent on unsalvaged portions of a past fire area, almost twice the lethal cover noted on salvaged portions. Monsanto and Agee (2008) also note "most of the concerns regarding salvage logging have dealt with short-term issues (Beschta et al. 2004). Longer term ecological effects, such as some of the effects of excessively high levels of coarse woody debris, should be factored into the decisionmaking

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			will remain standing. Some burned trees could live for another three to ten years and during that time they provide important habitat for wildlife, a seed source for the next generation of trees, and can help stabilize the soil. Snags, the standing dead trees, also provide critical wildlife habitat, especially for animals like cavity nesting birds.	process. In dry forest types there may be some long-term advantages for managers if excessive coarse woody debris loads are reduced early in the post-wildfire period." Monitoring and evaluation relative to post-fire recovery within Southwestern ponderosa pine ecosystems has become available since the release of the Warm DEIS. Monitoring observations (USDA Forest Service 2008a) note conditions of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. This paper evaluates the success of these areas in maintaining soil productivity and progress toward attainment of long-term desired conditions in terms of reforestation, growth rates, understory vegetation response, presence of coarse woody debris and snags, and an evaluation of the time to recovery to desired forest structure. The findings in this paper reinforce the principles concerning vegetation recovery and logging effects that were made in designing the WFR project. This project recognizes the roles snags and down coarse woody debris in the ecosystem and proposed actions incorporating maintaining snags and coarse woody debris through project design and the project design features. Only a small portion of the fire area is proposed for salvage logging (approximately 20 percent), and in the areas proposed for salvage logging, five to seven of the largest snags per acre would be retained in clumps. A great deal of burned habitat would be left unsalvaged in the fire area (approximately 80 percent), resulting in large areas of snag-related wildlife habitat. Current literature on snags and down logs, and effects of salvage logging on cavity-nesting species was considered in the impact analysis for these species. This is documented in the project wildlife reports.

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				Only dead trees are proposed for harvest in this project. With more than 2 years ensuing since the Warm Fire, it is readily apparent which conifer trees are dead and which have green needles and alive.
20	3	Fuels	Salvage logging can increase fire danger by leaving the smaller more flammable wood (slash) and increasing human access to the forests. Reconstructing, opening and utilizing roads that are currently closed, in this already heavily roaded area, will be detrimental to the forest, to wildlife, and as we mentioned earlier will expose it to greater fire risk.	Fire hazard can indeed increase when small woody fuel loading is increased. However, fuel arrangement is also important. Under the proposed action alternatives, excess levels of small woody fuels are treated through various methods including piling and lop and scatter. These treatments reduce the effects of the increased fuel loading by rearranging or removing some the fuels to increase decomposition rates and reduce the associated fire behavior. While this will increase fire risk in the short term, it also provides soil protection until adequate vegetation returns to the site. The addition of smaller woody fuels is a relatively short-term effect and largely mitigated by the planned fuel treatments. Under no action, the same fuels fall to the ground but are generally more available for burning, resulting in increased negative effects. Additional information has been added to the EIS to better demonstrate the effects of the various alternatives. An important concept in the project's fuel reduction purpose and need is that concerns about future fire severity in areas burned by the 2006 Warm Fire are directed more toward fires in future decades, rather than potential fires in the near term. Fire risk in the next decade or more, even with salvage logging, has been significantly reduced in the Warm Fire area due to the fire itself, which consumed most of the available fuel. In the absence of salvage, all fire-killed trees will eventually fall and accumulate on the soil surface, posing risks of much more intense fire behavior and severe fire effects several decades hence (Brown, Reinhardt, and Kramer 2003; Monsanto and Agee, 2008). Based on 30 years of fire occurrence data on the North Kaibab District, there has been an average annual fire

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				occurrence of 66 fires per year. Future fire events in this fire-adapted ecosystem are reasonably assured.
20	4	Economic	In addition to other concerns, salvage logging will cost the taxpayers money. In these times of tight budgets the limited dollars that are available should be focused on protecting communities from fire in the wildland-urban interface area, and not on further decimating our forests through salvage operations.	Statement expressing economic views and how dollars should be spent. Alternative 1, no action, addresses no salvage logging.
20	5	Other	We have no objection to tree removal for public safety purposes, but believe it should be limited to that. Instead of logging these burned areas, we would like to see the Forest Service, its biologists, fire experts, etc. learn from this fire and from the recovery of this area. Instead of planning huge timber sales, the Forest Service should also focus on educating and informing residents about the dangers of living in fire-prone areas and working to protect communities at risk from the fire dangers.	Limiting removals to hazard trees was considered but eliminated from detailed analysis in the "Warm Fire Recovery EIS" since that was similar to the "Hazard Tree Removal Along Highways and Forest System Roads and Trails in the 2006 Warm Fire Project" that was approved July 19, 2007. The Forest Service will continue efforts in fire education. Biologists, fire experts, etc., can learn from this fire and from the recovery of this area by comparing actions taken for the protection of soils, watershed, and wildlife values in the areas treated, to the no action areas interspersed across the high-severity burn area.
20	6	NEPA	I. Purpose and Need The Forest Service's attempt to define the project purpose and need in such narrow terms that only large salvage sales meet its objectives is unlawful. Although "[t]he stated [purpose and need] of a project necessarily dictates the range of 'reasonable' alternatives . . . an agency cannot define its objectives in unreasonably narrow terms." Carmel-by-the-Sea v. U.S. Dept. of Transp., 123 F.3d 1142, 1155 (9th Cir. 1997). By defining the purpose and need of the project to exclude any consideration of alternatives that would deal with threats to public safety and ecological restoration without proposing significant salvage logging of large trees, the Forest Service has defined its objectives in unreasonably narrow terms.	The purpose and need includes three aspects: (1) Recover economic value from burned timber; (2) Reforest burned conifer stands to move toward desired conditions; and (3) Break up fuel continuity in the project area. Limiting removals to hazard trees was considered but eliminated from detailed analysis since that was similar to the "Hazard Tree Removal Along Highways and Forest System Roads and Trails in the 2006 Warm Fire Project" that was approved July 19, 2007. The project area contains approximately 39,110 acres, which is the entire 2006 Warm Wildfire suppression area. The action alternatives propose a varying amount of salvage logging as summarized in the alternative comparison tables in the summary and in chapter 2.

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				Alternatives 2, 3 and 4 propose salvage logging on 9,114 acres (23 percent), 5,756 acres (15 percent), and 5,541 acres (14 percent). The responsible official determined these, along with the alternatives considered but eliminated from detailed analysis, provided an adequate range of alternatives. Please refer to the "Scope of the Project, Analysis, and Decision Framework" in EIS chapter 1. Other alternative concepts were considered, but not given detailed study in the EIS as described in chapter 2. It should also be noted that many other restoration actions have been planned and are being implemented in the Warm Fire area, as documented in the "Warm Fire Rehabilitation and Recovery Plan and Status Summary" on the forest Web site at http://www.fs.fed.us/r3/kai/projects/warm/. This is the overall recovery plan for the area affected by the Warm Fire and includes the status of many different fire rehabilitation projects and programs in progress in the Warm Fire burned area.
20	7	NEPA	The identified purpose and need for the project does not adequately consider the environmental integrity or rehabilitation needs of the area and clearly puts private economic interests above environmental recovery and the economic interests of the larger public. We would like to emphasize that there is no "need" to recover the economic value from the burned timber and this recovery attempt will in fact be environmentally destructive. In addition, the alleged need to break up fuel continuity in the burned area is inconsistent with the best available science on the "reburn hypothesis."	Part of the purpose and need is to break up fuel continuity in the project area. This aim is focused on the long-term impacts to soils and the future fuel loading anticipated. Large trees that fall to the ground become large fuels that when burned, burn for a longer time exposing the soil beneath and around them to higher levels of heat for longer periods of time than smaller diameter material. Future fires would expose the soils beneath and directly around coarse woody debris to high heat for extended periods of time, exposing roots to lethal temperatures (Monsanto and Agee 2008). Monsanto and Agee (2008) noted lethal cover ranged up to 24.7 percent on unsalvaged portions of a past fire area, almost twice the lethal cover noted on salvaged portions. Monsanto and Agee (2008) also note "most of the concerns regarding salvage logging have dealt with short-term issues (Beschta et al. 2004). Longer term ecological

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				effects, such as some of the effects of excessively high levels of coarse woody debris, should be factored into the decisionmaking process. In dry forest types there may be some long-term advantages for managers if excessive coarse woody debris loads are reduced early in the post-wildfire period." This research adds significantly to the body of scientific information regarding long-term fuels concerns following wildfires in the West, including "Coarse Woody Debris; Managing Benefits and Fire Hazard in the Recovering Forest," Brown, Reinhardt, and Kramer 2003, which discusses reburn potential and risks. Monitoring and evaluation relative to post-fire recovery within Southwestern ponderosa pine ecosystems has become available since the release of the Warm DEIS. Monitoring observations (USDA Forest Service 2008a) note conditions of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. This paper evaluates the success of these areas in maintaining soil productivity and progress toward attainment of long-term desired conditions in terms of reforestation, growth rates, understory vegetation response, presence of coarse woody debris and snags, and an evaluation of the time to recovery to desired forest structure. The findings in this paper reinforce the principles and anticipated effects concerning vegetation recovery and logging effects that were used in designing the WFR project.
20	8	NEPA	Because the Forest Service has failed to provide an ecological justification for salvage logging, and because salvage logging would come at significant ecological costs, the "recovery of the economic value of the timber" is, in effect, the dominant prevailing purpose and need for this project. But the real need is ecosystem recovery. We believe that the DEIS' failure to focus primarily on	The WFR project is one step in the recovery process. Whereas the comment assumes "salvage logging would come at significant ecological costs," the analysis in the EIS compares the ecological costs of the no action alternative with the various action alternatives. The scientific literature, in an examination of natural recovery

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			ecosystem recovery now may result in management activities that establish permanent and undesirable ecological trends such as exotic plant invasions, lack of forest regeneration, permanent soil damage, damaged wildlife habitat—factors that, in addition to their ecological consequences, are likely also to require significant future taxpayer investments. The purpose and need, by placing economic goals above the ecological needs of the burned area, directly conflicts with clear guidance set forth in the Kaibab National Forest plan: • "Carry out an ecological approach to multiple use resource management" (p. 7); • "(Conserve) the ecosystem and human environment" (p. 7); • Emphasize watershed condition improvement (p. 10); • Commit to "improving diversity, providing quality old-growth habitats, and composition of successional stages of vegetation and integrating desired wildlife habitat characteristics as a major consideration in the design of all vegetative treatments, whether they are for habitat improvement or for other purposes" (p. 12); • "Improve wildlife habitats (on the North Kaibab R.D.) through expanding knowledge of species requirements, development of habitat quality and diversity, and the identification and protection of key habitats" (p. 18); • "Maintain soil productivity and watershed condition" (p. 19); • "Apply ecosystem approaches to manage for landscape diversity mimicking natural disturbance patterns, incorporating natural variation in stand conditions and retaining special features such as snags and large trees, utilizing appropriate fires, and retention of existing old growth in accordance with forest plan old-growth standards and guidelines (p. 26); • "Encourage diversity of plant species in the overstory, understory, and ground cover" (p. 42)	in Southwest ponderosa pine forests, provides examples of the ecological costs of no action (Savage and Mast 2005, Strom and Fulé 2007). Lack of forest regeneration was documented in post-fire areas examined on the Kaibab National Forest. Areas with and without salvage did not differ in terms of site productivity potential. However, tree regeneration was typically limited to 150 feet or less from existing seed sources. Exotic plant invasions can be seen on the Bridger Fire within the Grand Canyon National Park. This element is not tied strictly to salvage operations and "natural recovery" does little to stop the spread of key noxious species. The forest has an overall recovery plan for the Warm Fire area, in which this project is one item. The decision maker identifies the purpose and need for proposed projects. For the WFR project the purpose and need includes three aspects: (1) Recover economic value from burned timber; (2) Reforest burned conifer stands to move toward desired conditions; and (3) Break up fuel continuity in the project area. Part of the purpose and need is to break up fuel continuity in the project area. This aim is focused on the long-term impacts to soils and the future fuel loading anticipated. Large trees that fall to the ground become large fuels that when burned, burn for a longer time exposing the soil beneath and around them to higher levels of heat for longer periods of time than smaller diameter material. Future fires would expose the soils beneath and directly around coarse woody debris to high heat for extended periods of time, exposing roots to lethal temperatures (Monsanto and Agee 2008). Monsanto and Agee (2008) noted lethal cover ranged up to 24.7 percent on unsalvaged portions of a past fire area, almost twice the lethal cover noted on salvaged portions. Monsanto and Agee (2008) also note "most of the concerns regarding salvage logging have dealt with short-term issues (Beschta et al. 2004). Longer term ecological

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				effects, such as some of the effects of excessively high levels of coarse woody debris, should be factored into the decisionmaking process. In dry forest types there may be some long-term advantages for managers if excessive coarse woody debris loads are reduced early in the post-wildfire period.” Monitoring and evaluation relative to post-fire recovery within Southwestern ponderosa pine ecosystems has become available since the release of the Warm DEIS. Monitoring observations (USDA Forest Service 2008a) note conditions of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. This paper evaluates the success of these areas in maintaining soil productivity and progress toward attainment of long-term desired conditions in terms of reforestation, growth rates, understory vegetation response, presence of coarse woody debris and snags, and an evaluation of the time to recovery to desired forest structure. The findings in this paper confirm the assumptions concerning vegetation recovery and logging effects that were made in designing the WFR project.
20	9	Economics	If the Forest Service continues to include “recovery of the economic value of the timber” as the primary purposes of this timber sale, it is imperative that it include a detailed cost-benefit analysis of how much the timber is worth, how much money the Forest Service is receiving from the sale, as well as how much the logging company will earn from the sale of the timber. The money the Forest Service receives from this timber sale must also be compared with the estimated final cost of the recovery effort. It is likely that the cost of failed recovery will not be covered by money gained from the salvage sale. Studies have shown that the expenses to the U.S. Treasury for post-fire salvage sales are often	The economic analysis has been updated to incorporate updated defect factors for the salvaged timber. The analysis acknowledges the costs of the entire proposed project would result in negative present net values. In addition to economic considerations, the analysis considered the long-term impacts to soils and the future fuel loading anticipated. Large trees that fall to the ground become large fuels that when burned, burn for a longer time exposing the soil beneath and around them to higher levels of heat for longer periods of time than smaller diameter material. Breaking up the future large fuel component is one of the purposes for the WFR project. Future fires would expose

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			substantially larger than the money they return.i Relatively recent large scale salvage logging in Arizona associated with the Rodeo-Chediski Fire provides an important example. In reviewing the Draft Environmental Impact Statement for that project, we found that none of the post-fire salvage logging alternatives returned dollars to the people of the United States and in fact, every alternative, except the no action alternative, was projected to result in a net loss to American taxpayers. Alternative 2 would have a net deficit of $190,354, Alternative 3 would have a net deficit of $224,954, Alternative 4 a loss of $149,654, and Alternative 5 a loss of $219,754.ii	the soils beneath and directly around coarse woody debris to high heat for extended periods of time, exposing roots to lethal temperatures (Monsanto and Agee 2008). Monsanto and Agee (2008) noted lethal cover ranged up to 24.7 percent on unsalvaged portions of a past fire area, almost twice the lethal cover noted on salvaged portions. Monsanto and Agee (2008) also note "most of the concerns regarding salvage logging have dealt with short-term issues (Beschta et al. 2004). Longer term ecological effects, such as some of the effects of excessively high levels of coarse woody debris, should be factored into the decisionmaking process. In dry forest types there may be some long-term advantages for managers if excessive coarse woody debris loads are reduced early in the post-wildfire period." Monitoring and evaluation relative to post-fire recovery within Southwestern ponderosa pine ecosystems has become available since the release of the Warm DEIS. Monitoring observations (USDA Forest Service 2008a) note conditions of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. This paper evaluates the success of these areas in maintaining soil productivity and progress toward attainment of long-term desired conditions in terms of reforestation, growth rates, understory vegetation response, presence of coarse woody debris and snags, and an evaluation of the time to recovery to desired forest structure. The findings in this paper confirm the assumptions concerning vegetation recovery and logging effects that were made in designing the WFR project.
20	10	NEPA	The Kaibab Forest Plan goal to "manage suitable timberland to provide a sustained level of timber outputs to support local dependent industry" does not signify that salvage logging is appropriate nor does it indicate that wildland fire use areas should	The WFR project does not include the wildland fire use area.

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			be opened to logging. Targeting wildland fire use areas for salvage logging sets an unfortunate precedent. As the DEIS admits, wood products processing and forest restoration industries supports only 1 percent of area employment, approximately 569 jobs (DEIS p191). Taking this information into account, it is clear that efforts to "Build capacity to accomplish restoration needs" as well as creating jobs from the sale of salvage material will actually create a timber industry and employment need based on logging, rather than "supporting local dependent industries."	
20	11	Other	The Forest Service does not provide adequate reasons for rejecting the two more modest action alternatives, saying only that these alternatives do not meet the need for economic recovery. The Forest Service does not provide adequate explanation for rejecting Alternative 3, which would better protect sensitive soils by requiring winter logging for increased soil protection. For this alternative, "The operation of equipment on soils identified with severe erosion hazard would be restricted when soil conditions are such that accelerated soil erosion, excessive soil surface displacement, or excessive compaction would occur." Such requirements are simple and important mitigation measures to implement. Requiring winter harvesting is a simple way to minimize soil erosion and protect water quality. The DEIS does not adequately explain why requiring these simple guidelines have been rejected.	The rationale for the decision is provided in the record of decision.
20	12	NEPA	The DEIS states that the "There is a need for recovering the economic value of some of the burned timber … before the commercial value of the wood is lost to deterioration" (p10). The DEIS also states that the "commercial value of the wood is lost to deterioration in a few years" (p188). It has been more than 22 months since the fire and is quickly approaching 24 months. In addition, the only areas proposed for logging are those that experienced very high or complete tree mortality. Therefore, it is likely that most of the trees proposed for logging have lost their economic value and the purpose and need of the project can no	See also response to letter 20, comment 8 above regarding the three aspects included in the purpose and need identified for the WFR project. The economic analysis has been updated to incorporate updated defect factors for the salvaged timber. The analysis acknowledges the costs of the entire proposed project would result in negative present net values. In addition to economic considerations, the analysis considered the long-term impacts to soils and the future fuel loading

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			longer be met.	anticipated. Large trees that fall to the ground become large fuels that when burned, burn for a longer time exposing the soil beneath and around them to higher levels of heat for longer periods of time than smaller diameter material. Breaking up the future large fuel component is one of the purposes for the WFR project. Future fires would expose the soils beneath and directly around coarse woody debris to high heat for extended periods of time, exposing roots to lethal temperatures (Monsanto and Agee 2008). Monsanto and Agee (2008) noted lethal cover ranged up to 24.7 percent on unsalvaged portions of a past fire area, almost twice the lethal cover noted on salvaged portions. Monsanto and Agee (2008) also note "most of the concerns regarding salvage logging have dealt with short-term issues (Beschta et al. 2004). Longer term ecological effects, such as some of the effects of excessively high levels of coarse woody debris, should be factored into the decisionmaking process. In dry forest types there may be some long-term advantages for managers if excessive coarse woody debris loads are reduced early in the post-wildfire period." Recent visits to the Warm Fire hazard tree sale reveal sound wood 2 years after the wildfire. Most of the larger diameter (commercial-sized) ponderosa pine heartwood is very sound at this time. Monitoring and evaluation relative to post-fire recovery within Southwestern ponderosa pine ecosystems has become available since the release of the Warm DEIS. Monitoring observations (USDA Forest Service 2008a) note conditions of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. This paper evaluates the success of these areas in maintaining soil productivity and progress toward attainment of long-term desired conditions in terms of

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				reforestation, growth rates, understory vegetation response, presence of coarse woody debris and snags, and an evaluation of the time to recovery to desired forest structure. The findings in this paper confirm the assumptions concerning vegetation recovery and logging effects that were made in designing the WFR project.
20	13		II. The DEIS fails to insure the scientific integrity of its analysis, fails to provide the public with hard data and objective analysis supporting the agency's opinions and conclusions, and fails to insure compliance with NFMA and Forest Plan requirements. "NEPA imposes a procedural requirement that an agency must contemplate the environmental impacts of its actions." Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1149 (9th Cir. 1998). NEPA requires federal agencies "to prepare a detailed EIS for all 'major Federal actions significantly affecting the quality of the human environment.'" Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208, 1211-12 (9th Cir. 1998), citing 42 U.S.C. § 4332(2)(C). This "ensures that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts; it also guarantees that the relevant information will be made available to the larger [public] audience that may also play a role in both the decision making process and implementation of that decision." Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349 (1989). The Forest Service is required to insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements. The agency must identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement. 40 C.F.R. § 1502.24. The Forest Service must provide hard data and analysis supporting its theory that logging large trees is required to meet project objectives. Ecology Center v. Austin, 430 F.3d 1057, 1065 (9th Cir. 2005) (holding that the Forest Service violated NEPA by presenting its logging proposal as	The analysis was completed considering the applicable scientific information available and sources are cited in chapter 3 by resource area. Methodology and information considered is included in the resource analysis sections, by resource area, in chapter 3. A literature review of submitted literature was completed and is included in appendix B. Effects to wildlife species and habitat, including the appropriate management indicator species, from the proposed actions are discussed in chapter 3. While most native species of plants and animals inhabiting forest ecosystems evolved with natural adaptations to frequent low intensity fires, the Warm Fire burned at a higher intensity due to fuel buildup as a result of fire suppression activities over the last century.

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			benefiting wildlife species that depend on old-growth dependent species as a fact instead of an untested and debated hypothesis); Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1150 (9th Cir. 1998) (holding that Forest Service cannot rely on expert opinion within an EA without providing the public with supporting hard data or analysis); 40 C.F.R. § 1502.24. NFMA also gives a prominent role to science. We believe that the 1982 NFMA regulations govern this project because these are the regulations in place when the current Kaibab Forest Plan was developed, and because these are the only set of NFMA regulations that have not been found unlawful. However, even the 2000 NFMA regulations require the Forest Service to ensure "that the best available science is considered in planning." 36 C.F.R. § 219.2(a). In particular, the requirement to consider the best available science applies to all project decisions implementing current forest plans. 26 C.F.R. § 219.35(a). NFMA also requires the Forest Service to "provide for diversity of plant and animal communities" when planning for or evaluating proposed projects on national forests. 16 U.S.C. § 1604(g)(3)(B). Therefore, the Forest Service must manage "fish and wildlife habitat to . . . maintain viable populations of existing native . . . species in the planning area." 36 C.F.R. § 219.19 (1982). In order to ensure that the Forest Service is maintaining viable wildlife populations, the forests must designate Management Indicator Species ("MIS"), whose populations serve as a gauge for the health of the forest generally. Id. For each MIS species, the Forest Service must monitor their "population trends" and determine the relationship between population trends and "habitat changes." Id. In order to adequately assess population trends and habitat changes, the Forest Service must compile quantitative data on prior and present MIS populations and habitat conditions before engaging in activities that may affect those populations. Id. § 219.26; Idaho Sporting Congress v. Rittenhouse, 305 F.3d 957, 962 (9th Cir. 2002). Such data is necessary so the Forest Service can meet its obligation to analyze the project's impacts in terms of	

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			"both amount and quality of habitat and of animal population trends of management indicator species." 36 C.F.R. § 219.19.	
20	14	Wildlife	a. Effects of salvage logging on wildlife The DEIS fails to properly disclose to the general public the importance and uniqueness of post-fire forests for numerous wildlife species, and the negative impacts of post-fire logging on these species. Most native species of plants and animals inhabiting forest ecosystems evolved with natural adaptations to fire. One of the effects of fire is the creation of dead trees. Fire-killed snags and logs serve vital roles in the structure and function of healthy forest ecosystems in general, and are especially important for natural recovery processes following fire events (Franklin and Spies, 1991). They provide food and shelter to wildlife, fish, and numerous insects, microbes, and fungi that are vital to post-fire recovery and long-term site productivity (Harrod et al. 1998). Salvage logging has been demonstrated (and is likely to) negatively impact the unique and important wildlife habitat that exists in post-fire snag forests by: • Removing a high percentage of the largest snags and logs; • Reducing the number and quality of tree cavities; • Reducing insect and small mammal populations that serve as prey for wildlife. Lindenmayer and Possingham (1996) report that salvage logging traditionally removes a high percentage of the largest dead woody structure on a given site and can thus significantly change postfire habitat for wildlife". Blake (1982), Saab and Dudley (1998), and Sallabanks and McIver (1998) describe the potentially negative "structural" effects (ie., removal of snags and downed wood), and "functional" effects (ie., reduction in insect populations that serve as food for numerous wildlife species) of salvage logging. McIver and Star (2001) assert that most cavity nesting bird species show "consistent patterns of decrease" after salvage logging. Kotliar et al. (2002) surveyed 23 burns across western forests in 7 states. All	Effects to wildlife from the proposed actions are discussed in chapter 3. While most native species of plants and animals inhabiting forest ecosystems evolved with natural adaptations to frequent low intensity fires, the Warm Fire burned at a higher intensity due to fuel buildup as a result of fire suppression activities over the last century. This project recognizes the roles snags and down coarse woody debris in the ecosystem and proposed actions incorporating maintaining snags and coarse woody debris through project design and the project design features. Only a small portion of the fire area is proposed for salvage logging, and in the areas proposed for salvage logging, five to seven of the largest snags per acre would be retained in clumps in pre-fire mixed conifer, and a minimum of three to five snags per acre in all other areas. The majority of burned habitat would be left unsalvaged in the fire area (approximately 80 percent of the Warm Fire suppression area would not be salvaged with alternative 2 and none of the nearly 20,000-acre fire use area is proposed for salvage). Therefore, ample snags would be available to provide habitat for certain bird species and other wildlife that use snags. Current literature on snags and down logs, and effects of salvage logging on cavity-nesting species was considered in the impact analysis for these species. This is documented in the project wildlife reports. Post-fire habitat and the species that use that habitat type are discussed in the BE, BA and wildlife reports. Impacts of post-fire logging to these species is analyzed and documented in those same reports. The forest identified management indicator species (MIS) to disclose effects to groups of species associated with

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			were predominantly stand replacement fires and less than 10 years old. Forest types included ponderosa pine/Douglas fir, Jeffrey pine, white fir, lodgepole pine, spruce/fir and mixed conifer. Despite the wide geographic area and great variety of forest types "many species showed remarkably consistent patterns" (Kotliar et al., 2002). They found that "severely salvaged burns may decrease the suitability of postfire forests for most cavity nesting species." Salvage logging usually removes the best remaining habitat for wildlife, including the large snags that serve as nest trees for cavity nesting woodpeckers. Woodpeckers can eat up to 90 percent of the bark beetles in a tree and act as a natural control on the beetles that can proliferate after a fire (Massey and Parker, 1981). In order to ascertain a more complete picture of the effects of salvage logging on wildlife viability, We are requesting that the Forest Service fully analyze the effects of the above-documented results of the salvage logging (the proposed action) on the following species (listed by functional guild): Effects of reducing the quantity and quality of snags, and the amount of unlogged snag forest, on these primary cavity nesting species that may occur in the project area: *Picoides scalaris* Ladder-backed woodpecker *Melanerpes formicivorus formicivorus* (NM) Acorn woodpecker *Picoides villosus* Hairy woodpecker *Picoides tridactylus dorsalis* (NM) Northern three-toed woodpecker *Melanerpes lewis* Lewis's woodpecker *Picoides albolarvatus* White-headed woodpecker *Colaptes auratus* Northern flicker *Sphyrapicus thyroideus* nataliae (NM) Williamson's sapsucker *Sitta pygmaea melanotis* (NM) Pygmy nuthatch *Sitta carolinensis nelsoni* (NM) White-breasted nuthatch	similar habitat characteristics, similar to functional guilds. The hairy woodpecker, pygmy nuthatch and red-naped sapsucker were analyzed as MIS species. The hairy woodpecker, specifically, represented snags in ponderosa pine, mixed conifer, and spruce-fir. Snags were a primary concern which was addressed through project design. The effects of the Warm Fire on snags were addressed as a stand alone concern under the environmental consequences as well as related issues under specific sensitive species (i.e., northern goshawk) and MIS (i.e., hairy woodpecker). The Forest Service is required to analyze impacts to Federal listed or candidate species, Forest Service sensitive species, Forest Service MIS, and migratory land birds. The Forest Service has met these obligations, and documentation is contained in the BA, BE and wildlife reports, and carried forward into the EIS. Please note that some of the species listed are not known to occur on the Kaibab Plateau.
20	15	Wildlife	Effects of reducing the quantity and quality of snags, and the amount of unlogged snag forest, on these secondary cavity nesting	Effects to wildlife from the proposed actions are discussed in chapter 3. While most native species of plants and animals inhabiting forest ecosystems evolved with natural

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			species that may occur in the project area: *Falco sparverius sparverius* American kestrel *Tyto alba scopoli* Common barn-owl *Aegolius acadicus acadicus* Northern saw-whet owl *Otus flammeolus* Flammulated owl *Glaucidium gnoma californicum* Northern pygmy owl *Chaetura vauxi* Vaux's swift *Myiarchus cinerascens cinerascens* (NM) Ash-throated flycatcher *Progne subis* Purple martin *Tachycineta thalassina lepida* Violet-green swallow *Tachycineta bicolor* Tree swallow *Poecile atricapillus* Black-capped chickadee *Poecile sclateri eidos* Mexican chickadee *Poecile gambeli gambeli* Mountain chickadee *Parus wollweberi* Bridled titmouse *Sitta Canadensis* Red-breasted nuthatch *Certhia Americana* Brown creeper *Troglodytes aedon parkmannii* House (Brown-throated) wren *Sialia mexicana bairdi* Western bluebird *Sialia sailis* Eastern bluebird *Strix occidentalis lucida* Mexican spotted owl *Sialia currucoides* Mountain bluebird	adaptations to frequent low intensity fires, the Warm Fire burned at a higher intensity due to fuel buildup as a result of fire suppression activities over the last century. This project recognizes the roles snags and down coarse woody debris in the ecosystem and proposed actions incorporating maintaining snags and coarse woody debris through project design and the project design features. Only a small portion of the fire area is proposed for salvage logging, and in the areas proposed for salvage logging, five to seven of the largest snags per acre would be retained in clumps in pre-fire mixed conifer and a minimum of three to five snags per acre in all other areas. A great deal of burned habitat would be left unsalvaged in the fire area. Current literature on snags and down logs, and effects of salvage logging on cavity-nesting species was considered in the impact analysis for these species. This is documented in the project wildlife reports. Post-fire habitat and the species that use that habitat type are discussed in the BE, BA and wildlife reports. Impacts of post-fire logging to these species is analyzed and documented in those same reports. The forest identified management indicator species (MIS) to disclose effects to groups of species associated with similar habitat characteristics, similar to functional guilds. The hairy woodpecker, pygmy nuthatch and red-naped sapsucker were analyzed as MIS species. The hairy woodpecker, specifically, represented snags in ponderosa pine, mixed conifer, and spruce-fir. Snags was a primary concern which was addressed through project design. The effects of the Warm Fire on snags were addressed as a stand alone concern under the environmental consequences as well as related issues under specific sensitive species (i.e., northern goshawk) and MIS (i.e., hairy woodpecker). The Forest Service is required to analyze impacts to Federal listed or candidate species, Forest Service sensitive species,

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				Forest Service MIS, and migratory land birds. The Forest Service has met these obligations, and documentation is contained in the BA, BE and wildlife reports, and carried forward into the EIS. Please note that some of the species listed are not known to occur on the Kaibab Plateau.
20	16	Wildlife	Effects of reducing the number and quality of snags, and the amount of unlogged snag forest, on these aerial feeding insectivorous species that may occur in the project area: *Cypseloides niger borealis* Black swift *Aeronautes saxatalis saxatalis* White-throated swift *Caprimulgus vociferus arizonae* Whip-poor-will *Phalaenoptilus nuttalli nuttalli* Common poor-will *Tachycineta bicolor* Tree swallow *Chordeiles minor* Common nighthawk *Tachycineta thalassina lepida* Violet-green swallow *Empidonax wrightii* Gray flycatcher *Empidonax oberholseri* Dusky flycatcher *Contopus cooperi* Olive-sided flycatcher *Empidonax hammondii* Hammond's flycatcher *Contopus pertinax pallidiventris* Greater pewee (Coue's flycatcher) *Myiarchus cinerascens cinerascens* Ash-throated flycatcher *Sayornis saya* Say's phoebe *Contopus sordidulus* Western wood-pewee *Empidonax occidentalis* Cordilleran flycatcher	Effects to wildlife from the proposed actions are discussed in chapter 3. While most native species of plants and animals inhabiting forest ecosystems evolved with natural adaptations to frequent low intensity fires, the Warm Fire burned at a higher intensity due to fuel buildup as a result of fire suppression activities over the last century. This project recognizes the roles snags and down coarse woody debris in the ecosystem and proposed actions incorporating maintaining snags and coarse woody debris through project design and the project design features. Only a small portion of the fire area is proposed for salvage logging, and in the areas proposed for salvage logging, five to seven of the largest snags per acre would be retained in clumps in pre-fire mixed conifer and a minimum of three to five snags per acre in all other areas. A great deal of burned habitat would be left unsalvaged in the fire area. Current literature on snags and down logs, and effects of salvage logging on cavity-nesting species was considered in the impact analysis for these species. This is documented in the project wildlife reports. Post-fire habitat and the species that use that habitat type are discussed in the BE, BA and wildlife reports. Impacts of post-fire logging to these species is analyzed and documented in those same reports. The forest identified management indicator species (MIS)

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				to disclose effects to groups of species associated with similar habitat characteristics, similar to functional guilds. The hairy woodpecker, pygmy nuthatch and red-naped sapsucker were analyzed as MIS species. The hairy woodpecker, specifically, represented snags in ponderosa pine, mixed conifer, and spruce-fir. Snags was a primary concern which was addressed through project design. The effects of the Warm Fire on snags were addressed as a stand alone concern under the environmental consequences as well as related issues under specific sensitive species (i.e., northern goshawk) and MIS (i.e., hairy woodpecker). The Forest Service is required to analyze impacts to Federal listed or candidate species, Forest Service sensitive species, Forest Service MIS, and migratory land birds. The Forest Service has met these obligations, and documentation is contained in the BA, BE and wildlife reports, and carried forward into the EIS.
20	17	Wildlife	Effects of locally reduced insect populations resulting from salvage logging to the following insectivorous species that may occur in the project area: *Cypseloides niger borealis* Black swift *Aeronautes saxatalis saxatalis* White-throated swift *Caprimulgus vociferus arizonae* Whip-poor-will *Phalaenoptilus nuttalli nuttalli* Common poor-will *Tachycineta* bicolor Tree swallow *Chordeiles minor* Common nighthawk *Tachycineta thalassina lepida* Violet-green swallow *Empidonax wrightii* Gray flycatcher *Empidonax oberholseri* Dusky flycatcher *Contopus cooperi* Olive-sided flycatcher *Empidonax hammondii* Hammond's flycatcher *Contopus pertinax pallidiventris* Greater pewee (Coue's flycatcher) *Myiarchus cinerascens cinerascens* (NM) Ash-throated flycatcher	The forest identified management indicator species (MIS) to disclose effects to groups of species associated with similar habitat characteristics, similar to functional guilds. The Forest Service is required to analyze impacts to Federal listed or candidate species, Forest Service sensitive species, Forest Service MIS, and migratory land birds. The Forest Service has met these obligations, and documentation is contained in the BA, BE and wildlife reports, and carried forward into the EIS. Please note that some of the species listed are not known to occur on the Kaibab Plateau.

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			Sayornis saya Say's phoebe *Contopus sordidulus* Western wood-pewee *Empidonax occidentalis* Cordilleran flycatcher *Psaltriparus minimus* Bushtit *Regulus satrapa* Golden crowned kinglet *Regulus calendula calendula* Ruby crowned kinglet *Peucedramus taeniatus arizonae* Olive warbler *Dendroica nigrescens* Black-throated gray warbler *Dendroica townsendi* Townsend's warbler *Vireo gilvus swainsonii* Warbling vireo *Vireo olivaceus olivaceus* Red-eyed vireo *Icterus galbula* Northern oriole *Pheucticus melanocephalus* Black-headed grosbeak *Piranga ludoviciana* Western tanager *Vireo solitarius* Solitary vireo *Dendroica graciae graciae* Grace's warbler *Piranga flava* Hepatic tanager *Cardellina rubrifrons* Red-faced warbler *Troglodytes aedon parkmannii* House (Brown-throated) wren *Gymnorhinus cyanocephalus* Pinyon jay *Perisoreus canadensis* Gray jay *Nucifraga Columbiana* Clark's nutcracker *Carpodacus mexicanus frontalis* House finch *Carpodacus purpureus* Purple finch *Cyanocitta stelleri macrolopha* Steller's jay *Stellula calliope* Calliope hummingbird *Lampornis clemenciae bessophilus* Blue-throated hummingbird *Eugenes fulgens* Rivoli's (Magnificent) hummingbird *Selasphorus platycercus platycercus* Broad-tailed hummingbird *Turdus migratorius* American robin *Vermivora virginiae* Virginia's warbler *Sialia mexicana bairdi* Western bluebird *Sialia currucoides* Mountain bluebird *Salpinctes obsoletus* Rock wren *Colaptes auratus* Northern flicker *Pipilo chlorurus* Green-tailed towhee *Molothrus ater* Brown-headed cowbird	

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			Oreortyx pictus Mountain quail *Meleagris gallopavo* Merriam's (?) turkey *Chaetura vauxi* Vaux's swift *Parus wollweberi* Bridled titmouse *Sialia sailis* Eastern bluebird *Picoides scalaris* Ladder-backed woodpecker *Sitta canadensis* Red-breasted nuthatch *Dendroica coronata* Yellow-rumped warbler *Picoides tridactylus dorsalis* Northern three-toed woodpecker *Picoides albolarvatus* White-headed woodpecker *Picoides villosus* Hairy woodpecker *Melanerpes lewis* Lewis's woodpecker *Sphyrapicus thyroideus nataliae* Williamson's sapsucker *Melanerpes formicivorus formicivorus* Acorn woodpecker *Poecile atricapillus* Black-capped chickadee *Poecile sclateri eidos* Mexican chickadee *Certhia americana* Brown creeper *Poecile gambeli gambeli* Mountain chickadee *Sitta carolinensis nelsoni* White-breasted nuthatch Sitta pygmaea melanotis Pygmy nuthatch	
20	18	Wildlife	Effects of fewer pine bark beetle brood trees and locally reduced populations of bark beetles on the following timber drilling and gleaning insectivores that may occur in the project area: *Picoides tridactylus dorsalis* Northern three-toed woodpecker *Picoides albolarvatus* White-headed woodpecker *Picoides villosus* Hairy woodpecker *Melanerpes lewis* Lewis's woodpecker *Sphyrapicus thyroideus nataliae* Williamson's sapsucker *Melanerpes formicivorus formicivorus* (NM) Acorn woodpecker *Poecile atricapillus* Black-capped chickadee *Poecile sclateri eidos* Mexican chickadee *Certhia americana* Brown creeper *Poecile gambeli gambeli* Mountain chickadee *Sitta carolinensis nelsoni* White-breasted nuthatch *Sitta pygmaea melanotis* Pygmy nuthatch	Post-fire habitat and the species that use that habitat type are discussed in the BE, BA and wildlife reports. Impacts of post-fire logging to these species is analyzed and documented in those same reports. The forest identified management indicator species (MIS) to disclose effects to groups of species associated with similar habitat characteristics, similar to functional guilds. The Forest Service is required to analyze impacts to Federal listed or candidate species, Forest Service sensitive species, Forest Service MIS, and migratory land birds. The Forest Service has met these obligations, and documentation is contained in the BA, BE and wildlife reports, and carried forward into the EIS. Please refer to previous discussion of the area left

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				unsalvaged in the Warm Fire. Habitat for bark beetles and prey for timber drilling and gleaning insectivore species will be plentiful and would not be a limiting factor for these species. Please note that some of the species listed do not occur on the Kaibab Plateau.
20	19	Wildlife	Effects of ground based logging operations on these ground nesting species that may occur in the project area: *Oreortyx pictus* Mountain quail *Bonasa umbellus* Ruffed grouse *Dendragapus obscurus obscurus* Blue grouse *Meleagris gallopavo* Merriam's turkey *Chordeiles minor* Common nighthawk *Caprimulgus vociferus arizonae* Whip-poor-will *Phalaenoptilus nuttalli nuttalli* Common poor-will *Myadestes townsendi townsendi* Townsend's solitaire *Catharus guttatus* Hermit thrush *Vermivora virginiae* Virginia's warbler *Cardellina rubrifrons* Red-faced warbler *Junco hyemalis* Dark-eyed junco	The forest identified management indicator species (MIS) to disclose effects to groups of species associated with similar habitat characteristics, similar to functional guilds. The Forest Service is required to analyze impacts to Federal listed or candidate species, Forest Service sensitive species, Forest Service MIS, and migratory land birds. The Forest Service has met these obligations, and documentation is contained in the BA, BE and wildlife reports, and carried forward into the EIS. Please refer to previous discussion of the area left unsalvaged in the Warm Fire. Habitat for bark beetles and prey for timber drilling and gleaning insectivore species will be plentiful and would not be a limiting factor for these species. Please note that some of the species listed do not occur on the Kaibab Plateau.
20	20	Wildlife	Effects of ground based logging operations on these ground gleaning species that may occur in the project area: *Columba fasciata fasciata* Band-tailed pigeon *Carpodacus cassinii* Cassin's finch *Junco hyemalis* Dark-eyed junco *Spizella passerina arizonae* Chipping sparrow *Zenaida macroura* Mourning dove *Turdus migratorius* American robin *Vermivora virginiae* Virginia's warbler *Sialia mexicana bairdi* Western bluebird	The forest identified management indicator species (MIS) to disclose effects to groups of species associated with similar habitat characteristics, similar to functional guilds. The Forest Service is required to analyze impacts to Federal listed or candidate species, Forest Service sensitive species, Forest Service MIS, and migratory land birds. The Forest Service has met these obligations, and documentation is contained in the BA, BE and wildlife reports, and carried forward into the EIS.

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			Sialia currucoides Mountain bluebird *Salpinctes obsoletus* Rock wren *Colaptes auratus* Northern flicker *Pipilo chlorurus* Green-tailed towhee *Molothrus ater* Brown-headed cowbird *Oreortyx pictus* Mountain quail *Meleagris gallopavo* Merriam's turkey	Please refer to previous discussion of the area left unsalvaged in the Warm Fire. Habitat for bark beetles and prey for timber drilling and gleaning insectivore species will be plentiful and would not be a limiting factor for these species. Please note that some of the species listed do not occur on the Kaibab Plateau.
20	21	Wildlife	b. Effects to Management Indicator, Sensitive and T&E Species Northern goshawk The Warm Fire project violates NFMA because the Forest Service fails to demonstrate compliance with Forest Plan standards and guidelines for northern goshawks. 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 Plan, to provide additional standards and guidelines for northern goshawks. The Forest Service has failed to demonstrate that the project will comply with the Plan's mandatory standards and guidelines for the northern goshawk. 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 Plan. These standards and guidelines apply to all forested lands that are outside the protected areas for the Mexican spotted owl. The standards and guidelines for northern goshawks include, but are not limited to: (1) The Forest Service must survey the management analysis area prior to any habitat modifying activities, including a ½ mile beyond the proposed project boundary. The Forest Service must	The Forest Service is required to analyze impacts to Federal listed or candidate species, Forest Service sensitive species, Forest Service management indicator species, and migratory land birds. The Forest Service has met this obligation, and documentation is contained in the BA, BE and wildlife reports. Impacts to northern goshawks have been analyzed and documented in the wildlife report and updated in the EIS. This report discusses forest plan standards and guidelines per the amendment that provides for additional standards and guidelines for northern goshawks. Project design considers those standards and guidelines, and impact analysis is based on those standards and guidelines. Under research being done by RMRS every known nest is monitored on the N. Kaibab Plateau (including the national park). If nests are not occupied, territories containing those nests are searched to determine occupancy. Any spaces between territories not known to have been ever occupied are surveyed to R3 protocol to find any nest sites. The entire area of the WFR project is covered by known territories. All known historic nest sites were monitored and territories without occupied nests were monitored for occupancy. PFAs, based on historic nest trees were mapped to evaluate the effects of the Warm Fire. A nest site needs to be

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			use the R3 survey protocol in order to get complete coverage of the management analysis area, and must complete at least one year of surveys. (2) The Forest Service must establish and delineate on a map, a post-fledgling family area that includes 6 nesting areas per pair of nesting goshawks for known nest sites, old nest sites, areas where there is historic data of past nest sites, and where there have been repeated sightings. A post-fledgling family area (PFA) must be approximately 600 acres in size, and must include the nest sites and habitat most likely to be used by the fledglings during their early development. The 6 identified nest sites should each be approximately 30 acres in size, requiring a minimum total of 180 acres of nest areas within each PFA. (3) The Forest Service must manage for uneven-age stand conditions for live trees and retain live reserve trees, snags, downed logs, and woody debris levels; (4) The Forest Service must manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape; (5) The Forest Service must sustain a mosaic of vegetation densities, age classes and species composition across the landscape; (6) The Forest Service must provide foods and cover for goshawk prey; (7) The Forest Service must limit human activity in nesting areas and near PFAs during the breeding season, which extends from March 1 to September 30; (8) The Forest Service must manage the ground surface layer to maintain satisfactory soil conditions i.e., minimize soil compaction and maintain hydrologic and nutrient cycles; (9) The required habitat structures, such as tree size, snags, dead and down material, etc., are to be evaluated at (a) the ecosystem	mapped and documented to design treatments to restore or retain needed forest structure, such as large trees, canopy cover, etc. Proposed treatments will only occur in mixed-high to high fire severity which due to high tree mortality is no longer goshawk habitat. Only dead trees will be removed, therefore, there will be no change in forest structure at the nest site, PFA, or project area levels. Because no action alternative will change the green tree forest structure, it was not necessary to arbitrarily map 30-acre nest sites. The plan uses the term "should" be at EMA level as the largest scale because most projects are smaller than this scale. EMAs are generally around 10,000 acres and goshawks have home ranges around 6,000 acres in size so this is a good scale from which to evaluate changes in habitat characteristics. The WFR project is over 39,000 acres and contains all or parts of 10 EMAs. The total Warm Fire contains 2 additional EMAs. Therefore, the analysis was based on the GA as the largest scale, with the project boundary being the middle scale, and the site being the small scale. Site data was aggregated to evaluate the middle and larger scales. Because of the size of goshawk home ranges, it is not reasonable or practical to measure many of the habitat elements at the GA or district-wide scale which for GA 13 is over 275,000 acres. See chapter 3 of the EIS for the analysis on goshawks. As described in chapter 1 of the EIS, the scope of the Warm Fire Recovery project does not include modifying road densities or decisions related to motorized access. Those topics are being addressed district-wide (including the Warm Fire area) in a separate analysis scheduled for 2009 and a decision anticipated in 2010. The soil section in chapter 3 notes the Region 3 FSH 2509.22_20. Best Management Practices for timber and

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			management area level, (b) the mid-scale such as drainage, and (c) the small scale of site. (10) For areas outside of PFAs, the required distribution of vegetation structural stages is 10% VSS1, 10% VSS2, 20% VSS3, 20% VSS4, 20% VSS5, and 20% VSS6. (Actual percentages may vary + or – up to 3%). (11) Snags are to be 18 inches or larger dbh and 30 feet or larger in height, downed logs are to be 12 inches in diameter and at least 8 feet long, and woody debris must be 3 inches or larger on the forest floor. (12) For areas outside PFAs, canopy cover for Ponderosa pine forest is to average 40+% for VSS4, 5, and 6. (13) Within PFAs, the canopy cover for Ponderosa pine forest is to average 50+% for VSS4, 5, and 6. (14) Within nesting areas, the area must contain only mature to old forest (VSS5 and 6) having a canopy cover between 50-70% with mid-aged VSS6 trees 200-300 years old. (15) Road densities are to be managed at the lowest level possible, and where timber harvesting is prescribed to achieve desired forest conditions, the Forest Service is to use small, skid trails in lieu of roads. Problems attending modeling of future forest development detailed in the "regeneraton" and "soils" sections of these comments undermine conclusions about the ability of the proposed actions to comply with or maximize movement toward Forest Plan direction for northern goshawk habitat management in the context of a burned forest environment. The DEIS therefore fails to demonstrate that the proposed project will comply with these numerous mandatory requirements from the KNF Plan, in violation of NFMA. Neighbors of Cuddy Mountain, 137 F.3d at 1377, citing 16 U.S.C. § 1604(i); 36 C.F.R. § 219.10(e). Moreover, the DEIS fails to provide the public with the hard data and objective analysis that is necessary to independently determine and calculate whether	road activities are incorporated into the design features. This complies with the sustainability of soils requirements in the National Forest Management Act, the maintenance of water quality and improving degraded waters as described in the Clean Water Act, and complying with the MOU on Water Quality with the State of Arizona.

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			the project will in fact be consistent with these requirements. Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1150 (9th Cir. 1998) (holding that NEPA requires the public to receive the underlying environmental data from which the Forest Service experts derive their opinions and conclusions). As it stands, there is no way for the public to determine compliance with the numerous, mandatory northern goshawk standards and guidelines, and therefore the Forest Service has not demonstrated compliance with these standards as required by NFMA. The failure of DEIS to demonstrate compliance with all applicable goshawk standards and guidelines violates NFMA. Neighbors of Cuddy Mountain, 137 F.3d at 1377; 16 U.S.C. § 1604(i); 36 C.F.R. § 219.10(e).	
20	22	Wildlife	Kaibab and red squirrel The Forest Service must provide for the diversity of fish and wildlife populations, 16 U.S.C. 1604(g)(3)(B), and must therefore insure the viability of fish and wildlife species that depend on our national forests for habitat. Each of these species use green (unburned) conifer forests as their primary habitat, the Kaibab squirrel preferring ponderosa pine (though will use mixed conifer) forests and the Red squirrel mixed conifer forests. The DEIS fails to analyze the effects of increased fire frequency resulting from cheat grass invasions (stemming from the Warm Fire and exacerbated by salvage logging and livestock grazing activities) on mixed conifer forests located adjacent to the project area. The proposed action has the potential to increase the likelihood of fires spreading from the project area into adjacent mixed conifer forests, potentially resulting in uncharacteristically homogenous severe fire and destroying additional habitat for both species. The Forest Service's conclusion for Kaibab squirrel and red squirrel is arbitrary and in violation of both NEPA and NFMA for a number of reasons. The Forest Service provides no information regarding current populations or the population trends throughout the national forest or ranger district, no information the amount of habitat needed for these species throughout the forest or ranger	See response to letter 15, comment 29 regarding NNIS. Both habitat trends and population trends for Kaibab squirrel and red squirrel are discussed in the wildlife report. Additionally, the current condition of the project area as it relates to habitat for these species is discussed. Analysis of impacts is based on the current habitat condition within the project area. No activities are proposed in unburned conifer forest. While cheatgrass is expected to be present in the burned area, it is not expected to dominate the project area for two reasons: (1) the project area is a higher elevation (cooler and wetter climate) than the Great Basin habitats where cheatgrass colonization has been more problematic (see NNIS report, EIS chapter 3) and (2) after two growing seasons following the fire, the native grass and forbs response in the burned area is strong and expected to out-compete cheatgrass.

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			district, and no information on the amount of habitat that is currently available throughout the forest or ranger district. As a result, neither the public nor decisionmaker will have any rational basis to conclude whether or not this project is "likely" to affect the forest-wide habitat, population trends, or viability of this species. Until this information is made available, the proposed project violates NFMA and NEPA. See e.g., Neighbors of Cuddy Mountain v. U.S. Forest Service, 137 F.3d 1372 (9th Cir. 1998) (explaining Forest Service obligations under NFMA and NEPA for wildlife species); Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1150 (9th Cir. 1998) (agency must provide public with hard data and analysis to support conclusions); 16 U.S.C. 1604(g)(3)(B); 40 C.F.R. 1502.24.	
20	23	Wildlife	Red-naped sapsucker The Forest Service must provide for the diversity of fish and wildlife populations, 16 U.S.C. 1604(g)(3)(B), and must therefore insure the viability of fish and wildlife species that depend on our national forests for habitat. For the red-naped sapsucker, the DEIS acknowledges the importance of aspen forest and that red-naped sapsucker populations are likely declining Forest-wide (but no population data are provided here). See DEIS 145-146. The DEIS fails to analyze the effects of increased fire frequency resulting from cheat grass invasions (stemming from the Warm Fire and exacerbated by salvage logging and livestock grazing activities) on the development of future aspen forests. The DEIS also fails to analyze the cumulative impacts of livestock and wildlife grazing and browsing on aspen recruitment, the development of aspen stands and indirect effects therein to red-naped sapsucker habitat and populations. The Forest Service's conclusion for red-naped sapsucker is arbitrary and in violation of both NEPA and NFMA for a number of reasons. The Forest Service provides no information regarding current populations or the population trends throughout the national forest or ranger district, no information the amount of	Both habitat trends and population trends for red-naped sapsucker are discussed in the wildlife report. Additionally, the current condition of the project area as it relates to habitat for this species is discussed. Analysis of impacts is based on the current habitat condition within the project area. Refer to the discussion of cheatgrass invasion in the preceding response. Livestock and wildlife grazing are not expected to significantly affect aspen regeneration in the Warm Fire. There have been a number of large fires in ponderosa pine and mixed conifer forest types on the North Kaibab District in the past 30 years. These have created numerous foraging opportunities for the Kaibab deer herd. Ungulate browsing impacts to aspen regeneration in past fires have not been highly notable or problematic. For example, the 1974 Moquitch Fire area has a very strong aspen component that developed in the presence of ungulate browsing (Angela Gatto, North Kaibab District wildlife biologist, personal communication). The Arizona Game and Fish Department manages the Kaibab Plateau big game population with strong preference toward mule deer and against elk, so the

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			habitat needed for these species throughout the forest or ranger district, and no information on the amount of habitat that is currently available throughout the forest or ranger district. As a result, neither the public nor decisionmaker will have any rational basis to conclude whether or not this project is "likely" to affect the forest-wide habitat, population trends, or viability of this species. Until this information is made available, the proposed project violates NFMA and NEPA. See e.g., Neighbors of Cuddy Mountain v. U.S. Forest Service, 137 F.3d 1372 (9th Cir. 1998) (explaining Forest Service obligations under NFMA and NEPA for wildlife species); Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1150 (9th Cir. 1998) (agency must provide public with hard data and analysis to support conclusions); 16 U.S.C. 1604(g)(3)(B); 40 C.F.R. 1502.24.	elk population there has been nonexistent to very small and is expected to remain so in the future.
20	24	Wildlife	Hairy woodpecker The Forest Service must provide for the diversity of fish and wildlife populations, 16 U.S.C. 1604(g)(3)(B), and must therefore insure the viability of fish and wildlife species that depend on our national forests for habitat. For the hairy woodpecker, the DEIS acknowledges the importance of high severity post-fire habitat, that the species is in the area, and the species will be adversely and significantly affected by the proposed logging. See DEIS at 141-144. The DEIS fails to analyze the life of suitable unlogged snag forest habitat for hairy woodpecker as it may occur temporally and cumulatively across the Kaibab Plateau, and it fails to analyze the potential effects of the action alternatives within that context. The DEIS then arbitrarily concludes, however, that the logging is "unlikely" to affect the forest-wide habitat or population trends of the species. DEIS at 144. The Forest Service's conclusion for hairy woodpecker is arbitrary and in violation of both NEPA and NFMA for a number of reasons. The Forest Service provides no information regarding current populations or the population trends throughout the national forest or ranger district, no information the amount of	Both habitat trends and population trends for hairy woodpecker are discussed in the wildlife report. Additionally, the current condition of the project area as it relates to habitat for this species is discussed. Analysis of impacts is based on the current habitat condition within the project area.

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			habitat needed for these species throughout the forest or ranger district, and no information on the amount of habitat that is currently available throughout the forest or ranger district. As a result, neither the public nor decisionmaker will have any rational basis to conclude whether or not this project is "likely" to affect the forest-wide habitat, population trends, or viability of this species. Until this information is made available, the proposed project violates NFMA and NEPA. See e.g., Neighbors of Cuddy Mountain v. U.S. Forest Service, 137 F.3d 1372 (9th Cir. 1998) (explaining Forest Service obligations under NFMA and NEPA for wildlife species); Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1150 (9th Cir. 1998) (agency must provide public with hard data and analysis to support conclusions); 16 U.S.C. 1604(g)(3)(B); 40 C.F.R. 1502.24.	
20	25	Wildlife	California condor The DEIS on pages 125 and 126 states, "The project area is over 3 miles from the nearest site where nesting has been attempted. Project related activities would have no effect on condors attempting to nest at that site. If condor nesting activity is identified within 0.5 mile of any treatment area, the district biologist will identify appropriate temporal or spatial limitations to human disturbance during the nesting season (see project design features in chapter 2). Salvaging would open up areas, increasing potential transitory foraging habitat. Mule deer carcasses or gut piles present during or after hunting season would provide scavenging opportunities and would be more accessible to condors after salvage due to the more open nature of the salvaged areas. Condors are curious birds and may be attracted to the area during activities. If condors arrive and remain in or near human activity centers, additional measures would be taken as shown in chapter 2, project design features: (1) Avoid contact with the condors and contact the district biologist immediately; (2) education; and (3) cleanup work sites at the end of each day. Cleanup of the work sites would reduce the potential for interaction. The district biologist would coordinate with the appropriate Agency personnel	Impacts to California condors have been analyzed and documented in the biological assessment (BA), which was concurred by the Forest Service and U.S. Fish and Wildlife Service.

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			and necessary actions would be taken." Again, the Forest Service may not rely on mitigation measures and BMPs in lieu of actual effects analysis pursuant to NEPA. The DEIS fails to actually analyze the direct and indirect effects of California condors being attracted to, potentially coming into contact with, various aspects of the salvage logging operation. Such effects might include (1) consumption of or exposure to spilled hydrologic or motor fluids from logging equipment (despite BMPs or mitigation measures such spill frequently occur and go unnoticed), (2) direct contact with logging tractors, equipment or trees being felled, and (3) harassment by logging operations during foraging. The Forest Service must undertake a thorough analysis of potential direct, indirect and cumulative impacts of salvage logging operations to California condors in order for the DEIS to comply with NEPA, NFMA and ESA's Section 7 requirements.	
20	26	Wildlife	Mexican spotted owl In June 1996, Regional Forest Supervisor Charles Cartwright amended the forest plans of all 11 Southwestern Region National Forests. These amendments included new standards and guidelines to protect the Mexican spotted owl and the northern goshawk and their habitat as well as new grazing utilization standards, and old growth designations. While the adopted standards and guidelines are not adequate in many respects, particularly in relation to the conservation and protection of the goshawk, they still provide important management requirements. Standards and guidelines continue to apply to the project area even though the forest has burned because studies have documented that MSOs can return to burned areas. Jenness (2000) found that the presence of recent fire in a territory showed no evidence of affecting whether owls will be present or reproducing at that location.1 He also used statistical methods to demonstrate that the percentage of pine in a burned territory had the most influence on owl response, and that no fire severity variables had any significant and biologically interpretable influence on owl response. Although,	Surveys to protocol have been done over several years on the North Kaibab Ranger District. Protocol surveys have failed to ever detect MSO on the district. The MSO Recovery Plan, the final rule for designating critical habitat for MSO and forest plan direction all guide project design and impact analysis for MSO. This is documented in the biological assessment, which was concurred by the Forest Service and U.S. Fish and Wildlife Service.

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			the author states his results may not apply to 100% stand replacing fires, he does state that there is a threshold somewhere between 55% and 100%. Research from California indicates that not only to spotted owls return to burned territories, but may also be reproducing successfully in burned territories (Bond 2002). Bond demonstrates that, with regard to spotted owls that had returned to sites that experienced moderate to severe burns, 4 of 7 owl pairs produced fledglings the year following fire in their territories. The MSO standards and guidelines prohibit logging of trees greater than 24 inches in diameter in mixed-conifer and pine-oak forests (restricted areas). The MSO standards and guidelines and the Recovery Plan also recognize the need to prohibit disturbing activities in MSO habitat during nesting periods (March-Aug.). Such activity is inconsistent with standards set forth in the Forest Plan and would therefore violate NFMA. While we recognize that there is a low likelihood that breeding pairs of Mexican spotted owls exist in or near the project area (although we note a complete survey has not been conducted), the purpose of the recovery plan is to facilitate recovery of the threatened species, and to thus protect what has deemed to be potential habitat for the species. In that light, and in light of aforementioned studies about the owls' use of post-fire, adherence to Forest Plan standards and guidelines and the Recovery Plan is necessary in order to demonstrate compliance with NFMA and ESA's Section 7 requirements.	
20	27	Cactus	Paradine plains cactus The EIS on page 151 states that, "All action alternatives have the same number of units that are proposed for treatment within the known range of the cactus. No known occurrences are located near units proposed for treatments. Some treatments are present within the known range of the species (primarily reforestation). Due to the limited distribution and specific habitat types for this species, design criteria to prevent direct and indirect effects to this species include a complete flag and avoidance during project implementation. In addition, design criteria to reduce the chance of	During consultation with the U.S. Fish and Wildlife Service impacts to Paradine plains cactus were reviewed and updated. This information has been updated in the EIS. "No project activities would occur near any known populations of *Pediocactus paradinei* (Dr. Barbara Phillips, personal communication July 21, 2008). *P. paradinei* is associated with pinyon-juniper woodlands and shrub/grassland communities (Phillips et al. 1996). The key to presence and maintenance of this cactus is the occurrence of vescicular-arbuscular endomycorrhizaee to

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			the project introducing noxious or invasive weeds have been established. No treatment units occur within the project area that would be considered cumulative in effects to the Paradine plains cactus. The Warm Fire may have contributed to the spread of cheatgrass, which has been proven to increase fire frequency. A portion of the Warm Fire impacted the conservation area for this species. Within the suppression portion of the fire, 4,660 out of 5,735 acres (81 percent) are estimated to have complete vegetation mortality (Sanders 2006). Surveys for the Paradine plains cactus were conducted during September 2006 (Frye 2006) and the summer of 2007 (Rebitzke 2007) to determine the extent of effects from the Warm Fire to the species within the known range and found extensive mortality and impacts from downstream flooding. Past management activities and current use from grazing and illegal plant collections contribute to the existing conditions, but cause no new changes to the habitat for this species." As discussed later in these comments, the EIS cannot rely on mitigation measures in lieu of an actual analysis pursuant to NEPA. In this case, the Forest Service may not rely on mitigation measures to circumvent an analysis of the potential effects of project activities within known range of the cactus. The very existence of mitigation measures evidences the potential for those effects; they must be fully analyzed and disclosed pursuant to NEPA.	inoculate seedlings, which are associated with pinyon-juniper woodlands (Dr. Barbara Phillips, personal communication, July 21, 2008). The proposed project would occur within mixed conifer and ponderosa pine vegetations types. By definition, no project activities would occur in pediocactus habitat. No salvage treatments are proposed near any known occurrences of the cactus. Two stands slated for hand planting have potential to be near the Paradine Plains Cactus Conservation Assessment Area, but no known plants occur in this region of the conservation area. (Dr. Barbara Phillips, personal comm., July 21, 2008). Based on the discussion above, the effects of these activities, singly or in combination, would have no effect on the occurrences of Paradine plains cactus." See response to letter 15, comment 29 regarding NNIS.
20	28	NEPA	III. The DEIS fails to adequately consider, discuss and disclose the science and scientific disagreement and uncertainty concerning the potential environmental impacts of post-fire logging. As stated, the Forest Service is required to insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements. The agency must identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement. 40 C.F.R. § 1502.24. The Forest	Page 15 of the EIS notes the general lack of research specifically addressing high volumes of coarse woody debris and subsequent fire threat to soils, developing forests, and future fire control efforts. However, monitoring observations suggest fuels management can be effective in supporting forest recovery in fire-dependent ecosystems (USDA Forest Service 2008a). Based on 30 years of fire occurrence data on the North Kaibab District, there has been an average annual fire occurrence of 66 fires per year.

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			Service must provide hard data and analysis supporting its theory that logging large trees is required to meet project objectives. Ecology Center v. Austin, 430 F.3d 1057, 1065 (9th Cir. 2005) (holding that the Forest Service violated NEPA by presenting its logging proposal as benefiting wildlife species that depend on old-growth dependent species as a fact instead of an untested and debated hypothesis); Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1150 (9th Cir. 1998) (holding that Forest Service cannot rely on expert opinion within an EA without providing the public with supporting hard data or analysis); 40 C.F.R. § 1502.24. Significantly, an EIS must plainly disclose and respond to conflicting science and opposing scientific opinion in order to satisfy NEPA's procedural requirements. Earth Island Institute v. U.S. Forest Service, 442 F.3d 1147, 1172 (9th Cir. 2006); Sierra Club v. Bosworth, 199 F. Supp.2d 971 (N.D. Cal. 2002).	Future fire events in this fire-adapted ecosystem are anticipated. Scientific disagreement over potential impacts to post-fire logging are discussed in the EIS in the "Vegetation" section under the heading "Postfire Management Actions Discussion", in the "Soil Watershed" section, and in the "Fire" section. A literature review of submitted items considered is included in appendix B of the EIS.
20	29	Fuels	a. Fuel loading and re-burn Despite a significant body of either contradictory or unsupportive literature, the Forest Service's ecological argument for logging to prevent future fires relies nearly exclusively on Brown (2003). The DEIS does not include any other models or studies that corroborate or contradict this model. There is substantial research that refutes the "reburn hypothesis." The Warm Fire DEIS does not provide any substantial explanation for why the Forest Service has rejected the science that demonstrates salvage logging is ecologically destructive and that salvage logging does not prevent later burns. The DEIS relies centrally on the issue of post-fire fuel loading to provide ecological justification to post fire logging. According to the DEIS on page 38, CWD quantities differ little between the no action and action alternatives. The inherent uncertainties and inaccuracies in the modeling underpinning these conclusions provides an extremely weak empirical basis for decision making and renders the small differences in outputs conjectural at best. Moreover, the best available science on this subject, which has not been adequately discussed or considered in the DEIS (in fact, much	As stated in the EIS, part of the purpose of the Warm Fire Recovery project is "to break up fuel continuity in the burned area." Based upon reference conditions, the intent is to have surface fuel levels such that the historic fire regime of relatively frequent fires with low to mixed fire intensity and the associated process are maintained. We acknowledge that there is controversy over the so called "Re-burn hypothesis." The stated purpose of the WFRP is to break up the continuity of fuels, with the objective of promoting fuels conditions with low surface fire intensity and severity, and promote easier fire line construction, thereby allowing safe and effective management of both wildfires and prescribed fire. Treatments are designed to reduce the adverse effects of future fires. Additional literature reviews and modeling using the best available science and information has been added to the EIS to better demonstrate the effects of the various alternatives.

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			of its been ignored), either directly contradicts or fails to support the Forest Service's assertions that post-fire fuel loading poses a risk of future large scale intense fire in the burn area. It is critical, then, that the Forest Service fully analyze the effects of post-fire fuel loading using the best available science. The best available science either refutes or does not support the Forest Service's assertion that a significant risk of re-burn exists. Donato et al. (2006), Thompson et al. (2007) and McIver and Ottmar (2007) provide empirical evidence showing that short term fire hazard increases as a result of post-fire logging. Thompon et al. (2007) and McIver and Ottmar 2007 propose that unlogged areas are likely to experience longer-term elevated fire hazard levels, though empirical evidence is not offered. McIver and Starr (2000) state in their comprehensive literature review: "Following Beschta and others (1995) and Everett (1995), we found no studies documenting a reduction in fire intensity in a stand that had previously burned and then been logged". Beschta et al. (1995) state, "There is no ecological need for immediate intervention on the post-fire landscape.", "Fires are an inherent part of the disturbance and recovery patterns to which native species have adapted," and "Fires reset temporal patterns and processes that, if allowed to proceed undisturbed by additional human impact, provide dynamic and biologically critical contributions to ecosystems over long time frames." Rather than thoroughly examine the Beschta Report or any of the other abovementioned studies in the DEIS or acknowledge teir import, the Forest Service seeks every opportunity to justify post-fire salvage logging based on promotion of its reburn hypothesis by selectively relying on Brown (2003). Moreover, the DEIS ignores scientific literature published in the Southwest that reinforces the broader body of scientific literature describing long-term fire hazard conditions as a function of passive versus active management. Passavoy and Fulé (2006) documented post-fire downed fine woody debris ranged from 2.7 to 10 mg/ha-1 - well below the estimated range of 25.8 to 130.1 mg/ha-1 of slash	Future fires would expose the soils beneath and directly around coarse woody debris to high heat for extended periods of time, exposing roots to lethal temperatures (Monsanto and Agee 2008). Monsanto and Agee (2008) noted lethal cover ranged up to 24.7 percent on unsalvaged portions of a past fire area, almost twice the lethal cover noted on salvaged portions. Monsanto and Agee (2008) also note "most of the concerns regarding salvage logging have dealt with short-term issues (Beschta et al. 2004). Longer term ecological effects, such as some of the effects of excessively high levels of coarse woody debris, should be factored into the decisionmaking process. In dry forest types there may be some long-term advantages for managers if excessive coarse woody debris loads are reduced early in the post-wildfire period." Monitoring and evaluation relative to post-fire recovery within Southwestern ponderosa pine ecosystems has become available since release of the Warm Fire DEIS (USDA Forest Service 2008) which documents recent field observations of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. This paper evaluates the success of these areas in maintaining soil productivity and progress toward attainment of long-term desired conditions in terms of reforestation, growth rates, understory vegetation response, presence of coarse woody debris and snags, and an evaluation of the time to recovery to desired forest structure. The interdisciplinary team considered information from relevant literature and reviewed literature as documented in appendix B of the EIS, including Passavoy and Fulé (2006), Savage and Mast (2005) and several articles by Franklin. The WFR project design features include leaving snags to

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			in standard fire behavior models. They state, "the lower values at the seven wildfire sites imply that surface fire behavior at these sites would likely be substantially less intense than even that of a light logging slash fuel model". They documented coarse woody debris (CWD) below amounts (11.2 to 44.8 mg/ha-1) deemed appropriate for maintaining long-term forest productivity and wildlife habitat while minimizing fire hazard and soil heating in warm, dry forests. CWD measured within the most recent of the fires studied fell below the recommended thresholds as well. Noting the lack of data specific to southwestern forests on this topic, they conclude that, "since the fuel loads in our study fell within the ranges that are recommended as being both beneficial to the ecology of the site and not a wildfire threat, salvage logging based on future fire hazard does not seem appropriate for these sites". The authors offer two management recommendations: (1) Prescribed burning for lowering fuel loads in areas where post-fire fuels are deemed excessive. (Such burning can lower near-term fire hazard by reducing fine fuels, lower fire hazard associated with CWD in a controlled manner, and preserve soil intactness and wildlife habitat in the area treated.) (2) The authors suggest passive management where fuel loading is not deemed excessive. They conclude, "there is no evidence that continued passive management of these sites would have negative effects". Savage (2005) looked at Ponderosa pine forests after fire and worried that full recovery was not guaranteed. She counsels against actions on post-fire landscapes that could compound recovery problem and sees post-fire resource extraction as the problem. "Mitigation of the effects of intense fires may begin by avoiding actions that increase stress on these ecosystems, such as salvage logging or grazing. . ." Franklin (2003) is clearly against removing large trees from post-fire landscapes. He further advises against establishing dense plantations where they did not exist previous to fire. The DEIS employs models with little or no empirical foundation to generate weakly grounded assumptions regarding long-term fuel	meet or exceed forest plan guidelines, and retaining CWD on salvaged units for soil resource productivity. The "Fire Fuels" section in EIS chapter 3 notes the action alternatives would increase the amount of acres with flame lengths over 4 feet in the short term after salvage activities. However, by 2027 the action alternatives would have fewer acres in the flame length classes above 4 feet when compared to the no action alternative. This translates to fewer acres with potential for severe soil heating in 40 years under the action alternatives. The fire behavior, resistance to control and potential soil heating effects of the no action alternative are projected to become more severe over time. Much of the area would experience increasing fuel loads and the potential for more severe fire behavior and effects associated with the higher fuel hazard.

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			loading and fire hazard potential. Literature referenced within the document does not strongly support model assumptions or results. Conflicting science concerning potential long-term fuel loading and fire hazard conditions has not been adequately considered. Within the context of empirically weak modeling efforts, and inadequate interpretation of existing literature, the DEIS does not adequately disclose scientific uncertainties associated with effects of post-fire logging on long-term fuel loading and fire hazard potential.	
20	30	Soils	b. Soil effects The DEIS effects analysis for soils on pages 88-90 asserts that salvage logging would improve soil conditions and no logging would not. It considers soil impacts across three topical areas: soil hydrology, soil stability and nutrient cycling. The analysis offers primarily qualitative, narrative opinions on the effects of each alternative. The analysis fails to support conclusions with hard data and analyses; no empirical evidence is provided supporting analysis conclusions. It fails to discuss or disclose modeling data, assumptions, or meaningfully discuss analysis outputs. DEIS soils effects conclusions contradict the preponderance of published literature on salvage logging impacts—literature that the DEIS largely fails to cite, discuss or otherwise consider. Finally, we have attached as Appendix II to these comments a Warm Fire soils assessment conducted by Karen Goodwin. We hereby request that assessment be analyzed in the context of soil hydrology, stability and nutrient cycling. Soil hydrology The DEIS asserts that logging would improve soil hydrology and no logging would have no effect. It states that under the no action alternative soil hydrology would remain essentially the same. It states that soil hydrology conditions would improve slightly over current conditions under alternatives 2, 3 and 4. The DEIS fails to explain why or how salvage logging would actually improve soil hydrology or how salvage logging is better for soil hydrology than	The soils and hydrology field data and analysis were conducted to estimate whether proposed action alternatives would substantially affect soil hydrology, soil stability, or nutrient cycling. Indicators of disturbance to soil quality are generally based on visual indicators of disturbance, estimates of soil surface organic material (FSH 2509.18). Soil disturbance surveys, stratified by burn severity and soil type, were also conducted following methods described by Howes (2003). The "Howes" surveys were conducted to assess whether the fire and past activities had detrimentally affected soil productivity. Since the field observations of soil condition, as described by the Region 3 supplement to the Soil Management Handbook, are visual, the analysis is, by its nature, qualitative. Visual classes have been used by a variety of public and private entities (e.g. Craigg and Howes, 2007; Page-Dumroese et al. 2006; Curran et al. 2005; Heninger et al. 2002) for the assessment of change in soil-surface conditions from pre- to post-harvest. Visual classes (rather than classes dependent on analysis) offer a method to gather information about soil condition class in an efficient and consistent way. Therefore, most of the descriptions of potential disturbance to soil hydrology, soil stability, and nutrient cycling are more narrative and qualitative due to the fact that the Region 3 Soil Management Handbook directs the assessment of soil conditions through visual indicators of soil surface

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			no tractor logging. The DEIS cites no empirical studies, provides no modeling data, assumptions or outputs supporting its conclusions and fails to consider any published scientific literature on salvage logging impacts on soil hydrology. Moreover, the DEIS' conclusions directly contradict published literature demonstrating that salvage logging impedes the retention of soil moisture. For example, McIver (2001) found that salvaged landscapes experience greater heating of soils from lack of shade which decreases soil moisture content. Graham (1999) notes the same effect on salvaged landscapes of decreased soil moisture as a result of increased wind in treated post-fire landscapes. Soil stability The DEIS asserts that no logging would impair soil stability and logging would improve it. It states that for the no action alternative soil stability would be in an impaired or unsatisfactory condition for most soil map units due to a lack of ground cover and postfire accelerated erosion processes. For each action alternative, which were analyzed together and for which no discernable effects differences are noted, the DEIS states that soil stability would be improved for logged areas owing to the addition of logging slash to the soil surface. It states, "The decrease in erosion as compared to the no action condition is attributable to the increase in soil surface roughness from slash fines and CWD. Modeled sediment delivery to stream channels would be essentially the same as the volumes predicted for the upslope erosion rate. Soils would be less exposed to accelerated erosion due to the increased soil surface roughness added by residual logging slash. There would be some attendant soil displacement from the endlining of logs to skid trail areas on treatment units, but overall the negative effects would be minimized due to the application of project design features and BMPs." The Forest Service cites FSWEPP modeling that "indicates that erosion rates would be approximately 0.3 tons per acre per year for slopes 0 to 15 percent and 1 ton per acre per year for slopes 15 to 40 percent in alternatives 2 and 4; and approximately 0.2 ton per	characteristics. The soil erosion modeling efforts were conducted in order to aid in the discussion of soil displacement and erosion. The analysis utilized the Watershed Erosion Prediction Project (WEPP) web interfaces (both for the road interface and the disturbed WEPP interface). The model inputs are described in the "Assumptions" section of the "Soil and Hydrology" section of the EIS. The EIS will be updated to include model results for the no action which was included in the current condition description. The current scientific literature was considered and incorporated into the project design. Most of the soil and hydrology project design features are measures designed to address concerns raised by authors such as Beschta (1994) and Karr (2004). Recommendations concerning CWD and nutrient cycling (Graham, 1994; Brown, 2003) have also been built into the design of the project. The current scientific literature is not conclusive about post-fire salvage logging (McIver, 2003). There are several articles for and against post-fire salvage logging. However, there are very few scientific studies which describe the impacts of post-fire salvage logging utilizing current forest practices. For example, the literature review by McIver and Star (2000) indicates that logging residue may inhibit erosion by impeding overland flow. Pannkuk and Robichaud (2000) found that "A 50 percent cover of ponderosa pine needles reduced interrill erosion by 60 percent and rill erosion by 40 percent." Further, in the study by McIver (2003) erosion and sediment transport were measured in four replicated units with three different treatments (unharvested control, partial harvest, full harvest). "Soil displacement, compaction, and erosion were the most commonly observed types of machine caused disturbance. There was a significant difference among

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			acre per year for slopes 0 to 15 percent and 0.7 ton per acre per year for slopes 15 to 40 percent in alternative 3. The difference in erosion and sedimentation rates between alternative 3 and alternatives 2 and 4 is due to the decrease in ground disturbance on over-snow logging activity units for alternative 3." Again, no modeling results are provided for the no action alternative. No explanation of the model employed—its assumptions, data inputs, or methods—are provided in the DEIS. The DEIS fails to provide a detailed discussion of the impacts of tractor logging on soil stability, such as would occur as the result of tire rutting and soil gouging from endlining, or the construction of temporary roads or landings. The DEIS must fully disclose and analyze the negative effects that would be expected to result from tractor logging on burned soils. Salvage logging displaces soil by felling and dragging large-diameter trees across the exposed ground surface, thereby directly initiating erosion. One of the natural recovery processes initiated by fires is that when large-diameter snags fall to the ground across the slope contour, they serve as natural check-dams that slow runoff and retain soil, which is especially important on steep slopes (Maser et al. 1988. Brown et al. 2001). Thus, salvage logging also indirectly facilitates erosion through removal of large snags and logs that would naturally slow overland flow and retain soil. As discussed later in these comments, the Forest Service may not rely on BMPs and mitigation measures in place of a full analysis. The Forest Service is required to fully analyze and disclose anticipated effects to the environment that may result from the proposed action—including negative effects resulting from tractor logging.	treatments in the percentage of mechanically disturbed soil area, with controls having less area disturbed than harvested units. Despite significant soil disturbance, however, little sediment transport out of experimental units occurred, due largely to: (1) the practice of hand felling; (2) logging over snow or on dry ground; (3) low slopes; (4) heavy soils; (5) no new roads; and (6) the absence of extreme weather events after logging. Visual inspections indicated that relatively little sediment left the experimental units in the short term, and that the existing road system was responsible for most sediment transport." The EIS does not "assert" that "no logging would impair soil stability." The EIS maintains that soil hydrology and soil stability would be maintained through the project design features and best management practices. There will be some short-term impacts from soil displacement due to the felling and end lining of trees. Ground-based equipment will use existing skid trails where available, compaction areas will be limited, and ground-based equipment will be generally limited to 20 percent slopes or less with short pitches (of less than 100 feet) to 30 percent slopes. Some surface soil displacement will occur at sites where trees are yarded. However, because all ground-based activities are limited to slopes 20 percent or less with short pitches (100 feet or less), it is not expected that the project activities will create substantial erosion. The analysis considers the short-term impacts of salvage activities and the long-term impacts of maintaining high quantities of large fuels over the long term. Large trees that fall to the ground become large fuels that when burned, burn for a longer time exposing the soil beneath and around them to higher levels of heat for longer periods of time than smaller diameter material. Breaking up the future large fuel component is one of the purposes for the WFR project. Future fires would expose the soils beneath and directly

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				around coarse woody debris to high heat for extended periods of time, exposing roots to lethal temperatures (Monsanto and Agee 2008). Monsanto and Agee (2008) noted lethal cover ranged up to 24.7 percent on unsalvaged portions of a past fire area, almost twice the lethal cover noted on salvaged portions. Monsanto and Agee (2008) also note "most of the concerns regarding salvage logging have dealt with short-term issues (Beschta et al. 2004). Longer-term ecological effects, such as some of the effects of excessively high levels of coarse woody debris, should be factored into the decisionmaking process. In dry forest types, there may be some long-term advantages for managers if excessive coarse woody debris loads are reduced early in the post-wildfire period."
20	31	Soils	Soil nutrient cycling The DEIS asserts that logging would improve soil nutrient cycling and that no logging would leave nutrient cycling in an impaired condition. The DEIS states that "nutrient cycling would be in an improving condition for alternatives 2, 3, and 4 over approximately 9,114 acres, 5,756 acres and 5,541 acres respectively due to the addition of small and large woody material." It states that "nutrient cycling on a majority of the soil map units within the project area would be in an impaired or unsatisfactory condition due to the lack of ground cover and available organic materials at the soil surface. Soil organic material was largely removed from most soil map units within the high and moderate/high burn severity areas within the project area. The effects of the fire on soil hydrology, soil stability, and nutrient cycling would essentially stay on the current slow improvement trend of the postfire condition. However, exposed soils would be vulnerable to erosion due to the limited ground cover condition. The majority of treatments are proposed for areas where soil organic material was largely removed from most soil map units within the high and moderate/high burn severity areas within the project area." The DEIS fails to explain	The EIS notes the conflicting scientific views of salvage logging, specifically: "Post-wildfire salvage logging has been and continues to be a controversial activity on public lands. The arguments for and against post-fire salvage logging are particularly acute in the areas concerning effects to soil and water resources. Several white papers and opinion papers (Beschta et al. 1994; Ice, 2004) reflect the discussion from opposing viewpoints at high levels of the forest management research community. An exhaustive literature review by McIver and Starr (2000) further describes the lack of factual studies concerning the effects of different logging systems on soil and aquatic resources in various ecological regions. Much of the heated debate comes from concerns over logging practices in burned watersheds that are valid in the context of certain regional factors: geologic, biologic, or aquatic; however, these concerns may be greater or less significant or play a smaller role when viewed in the context of another physical or biological region. Thus, the issue of post-wildfire logging is further complicated by the lack of research specific to post-wildfire logging effects at the ecoregion scale.

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			why or how salvage logging would actually improve soil nutrient cycling or how salvage logging is better for soil nutrient cycling than no tractor logging. The DEIS cites no empirical studies, provides no modeling data, assumptions or outputs supporting its conclusions and fails to consider any published scientific literature on salvage logging impacts on soil nutrient. Nor are effects considered across alternatives and across time spans. This is particularly problematic for the issue soil nutrient cycling because trees removed during proposed logging contain nutrients that if left would eventually contribute to soil nutrient cycling. Moreover, the DEIS' conclusions directly contradict published literature demonstrating that salvage logging impedes soil nutrient cycling. Damage to soils through compaction (Kattleman 1996) and increased runoff and erosion (Waters 1995, Karr et al. 2004, Klock 1975, Potts et al. 1985, Maser 1996), which in turn may undermine the effectiveness of other postfire rehabilitation efforts aimed at reducing soil erosion and runoff (Robichaud et al. 2000). Removal of soil organic matter, reducing soil moisture retention capacity (Jenny 1980), and affecting soil biota and plant growth (Rose et al. 2001, Brown et al. 2003). Increased severity of subsequent fires (CWWR 1996, Odion et al. 2004), potentially resulting in further soil damage. In a study that compared five different post-fire salvage logging methods on ponderosa pine sites in eastern Washington, conventional tractor-based systems disturbed nearly 75% of the area, and caused erosion on over 30% of the area, but even helicopter logging caused soil disturbance on 12% of the area (Klock and Glen 1975). In addition to erosion, salvage logging is also known to cause soil compaction (Beschta et al. 1995, Sexton 1994). This also adversely impacts post-fire recovery and long-term site productivity by eliminating pore spaces in soil that retain air, water, and facilitate spread of fine roots. The result of decreased water infiltration and retention is increased surface runoff, sheetwash erosion, and subsequent sedimentation in streams. Salvage logging also causes nutrient losses not only directly	Even though research on the watershed effects of post-fire salvage is limited (McIver and Starr 2001), Ice (2004) finds that there is little evidence that carefully planned and conducted salvage harvest cannot be conducted without significant impacts (Neary and Hornbeck 1994). For example, the control watershed on the Entiat Burn yielded more post-fire sediment than those that were salvage logged (Helvey 1980). Further, several studies have suggested that needles, fine fuels, and other slash from salvage logging can increase the percent of ground cover and surface roughness, thereby reducing overland flow velocities and surface erosion (Robichaud 2003, Poff 1989). A more recent study of post-fire logging (Chase, 2006) concludes that logging slash is less of a factor in reducing sediment delivery due to the lack of ground contact it provides; Chase goes on to say that ground cover resulting from needle fall and revegetation of local plant species does provide for a reduction in sediment production. The analysis considers the short-term impacts of salvage activities and the long-erm impacts of maintaining high quantities of large fuels over the long term. Large trees that fall to the ground become large fuels that when burned, burn for a longer time exposing the soil beneath and around them to higher levels of heat for longer periods of time than smaller diameter material. Breaking up the future large fuel component is one of the purposes for the WFR project. Future fires would expose the soils beneath and directly around coarse woody debris to high heat for extended periods of time, exposing roots to lethal temperatures (Monsanto and Agee 2008). Monsanto and Agee (2008) noted lethal cover ranged up to 24.7 percent on unsalvaged portions of a past fire area, almost twice the lethal cover noted on salvaged portions. Monsanto and Agee (2008) also note "most of the concerns regarding salvage logging have dealt with short-term issues (Beschta et al. 2004).

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			through removal of topsoil, but indirectly through the removal of snags and logs that function as a major source of soil organic matter and a long-lasting reservoir of essential nutrients for microorganisms, plants, and animals (Maser et al. 1988). The problem with soil displacement, compaction, and erosion is that once topsoil has been removed from the ecosystem, it constitutes an irreplaceable loss of fertility, productivity and nutrient cycling, at least in human timescales (Beschta et al. 1995). Consequently, protection of the topsoil is a primary requisite for aiding post-fire recovery and maintaining long-term forest ecosystem health. The DEIS employs models with little or no empirical foundation to generate weakly grounded assumptions regarding long-term fuel loading and fire hazard potential. Literature referenced within the document does not strongly support model assumptions or results. Conflicting science concerning potential long-term fuel loading and fire hazard conditions has not been adequately considered. Within the context of empirically weak modeling efforts, and inadequate interpretation of existing literature, the DEIS does not adequately disclose scientific uncertainties associated with effects of post-fire logging on long-term fuel loading and fire hazard potential.	Longer term ecological effects, such as some of the effects of excessively high levels of coarse woody debris, should be factored into the decisionmaking process. In dry forest types,there may be some long-term advantages for managers if excessive coarse woody debris loads are reduced early in the post-wildfire period." Recent site visits to and monitoring of the Bridger Fire (June 2007) by the IDT hydrologist/soils scientist (Cavan Maloney) and the former Kaibab National Forest soils scientist (Dave Brewer), and monitoring (USDA Forest Service 2008a) found evidence that woody species and ground cover recovery were meeting desired conditions in salvage logged areas. The Bridger Fire burned approximately 10 years ago on the North Kaibab Ranger District and occurred on similar soils and slopes to the Warm Fire. Salvage logging was implemented shortly after the fire, and logging treatments and the implementation of BMPs were comparable to what is proposed for the Warm Fire area. There are no quantitative studies that were conducted on the Bridger post-fire logging, but these recent site visits indicate that ground cover and surface organic materials can recover within relatively short periods of time (Maloney 2006, observation, and Brewer 2006, personal communication)." Large trees that fall to the ground become large fuels that when burned, burn for a longer time exposing the soil beneath and around them to higher levels of heat for longer periods of time than smaller diameter material. Breaking up the future large fuel component is one of the purposes for the WFR project. Future fires would expose the soils beneath and directly around coarse woody debris to high heat for extended periods of time, exposing roots to lethal temperatures (Monsanto and Agee 2008). Monsanto and Agee (2008) noted lethal cover ranged up to 24.7 percent on unsalvaged portions of a past fire area, almost twice the

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				lethal cover noted on salvaged portions. Monsanto and Agee (2008) also note "most of the concerns regarding salvage logging have dealt with short-term issues (Beschta et al. 2004). Longer term ecological effects, such as some of the effects of excessively high levels of coarse woody debris, should be factored into the decisionmaking process. In dry forest types, there may be some long-term advantages for managers if excessive coarse woody debris loads are reduced early in the post-wildfire period." Monitoring and evaluation relative to post-fire recovery within Southwestern ponderosa pine ecosystems has become available since the release of the Warm EIS. Monitoring observations (USDA Forest Service 2008a) note conditions of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. This paper evaluates the success of these areas in maintaining soil productivity and progress toward attainment of long-term desired conditions in terms of reforestation, growth rates, understory vegetation response, presence of coarse woody debris and snags, and an evaluation of the time to recovery to desired forest structure.
20	32	Reforesta-tion	c. Tree regeneration, replanting and re-vegetation Although the DEIS acknowledges that tractor logging would impair natural regeneration, the DEIS inadequately discusses the scientific literature relating to this topic. The following salvage logging impacts have been demonstrated to directly and indirectly effect recovery and natural regeneration by: • reducing long-term productivity of trees; • crushing tree seedlings;	We have acknowledged that tractor logging will have an impact on vegetation. There are many design features included in the WFR project that are intended to reduce disturbance of recovering vegetation such as: restricting skidders and other fuels treatment equipment to designated skid trails during non-winter harvest and fuels reduction activities; using existing skid trails where available; and by limiting the compaction areas (refer to "Project Design Features and Monitoring," chapter 2).

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			• reducing vegetation biomass and plant species richness; • destroying nitrogen fixing plants and their benefits to early-succession biological communities; • negatively impacting micro-sites and their attendant tree regeneration; • increasing temperatures, winds and dryness of burned forests; • promoting the establishment and spread of invasive, exotic noxious weeds. Smith and Wass (1980) have shown that skid trails formed during logging operations can negatively impact long-term productivity of trees growing directly on those skid trails. Sexton (1998) has shown that salvage logging may reduce vegetation biomass, and overall plant species richness in the first years after logging. Kotliar et al. (2002), Roy (1956), and Grifantini et al. (1992) have shown that salvage logging can have pronounced negative effects on species that require early successional habitat – precisely the species land mangers should avoid putting under additional stress (Beschta et al. 2004, Karr et al. 2004). For instance, impacting early successional Nfixers (such as Lupinus spp.) can "significantly affect a major pathway of nutrient replenishment in the postfire environment" (Beschta et al., 2004). Sexton (1998) found that in an Oregon ponderosa pine fire site, salvage logging impaired regeneration by negatively affecting microsite conditions. Logged sites were warmer, drier, and windier than unlogged sites (Sexton, 1998). Even when salvage operations occurred over snow in an Oregon ponderosa pine forest, regenerating understory plants were significantly negatively affected (Sexton, 1998). Logging activities conducted beyond six months after a burn event may have the greatest detrimental effects by disrupting native plant colonization (Kolb, 2002). Beschta et al. (1995) argue that "there is no ecological need for the immediate intervention on the postfire landscape….By acting quickly, we run the risk of creating new problems before we solve the old ones."	While it is important to consider the concepts presented in the papers you have cited, none of the studies that you cite occurred in the ponderosa pine forests of Arizona. Scientific studies of post-fire management activities and resulting conditions relevant to the Kaibab Plateau were considered during the analysis. For example, Savage and Mast (2005) studied multiple ponderosa pine sites within the Southwestern U.S. that had experienced stand-replacing crown fire in the late 20th century. Although the effects of large, stand-replacing wildfires are variable, several fires have led to long-term changes from forested systems. One of the potential vegetation pathways they determined was long-term, self perpetuating grass or shrub fields with little or no conifer presence. Indications at this time are that conifer natural regeneration within the high severity burn areas within the WFR project is nonexistent (Roccaforte et al. 2008) and that these areas that do not have substantial aspen sprouting are on a pathway to long-term, self perpetuating grass and brush fields. The reforestation project design is an effort to re-establish conifer presence and interrupt the vegetation pathway that has resulted from a stand-replacing crown fire. Rapid reforestation to levels of site occupancy from 35 to 55 percent of max SDI will have many benefits. Forest cover will be promoted, wildlife habitat will be maintained, functioning watersheds will be restored, and thrifty stands of healthy trees will store carbon. This process will take decades, but the conditions that resulted in stand-replacing crown fire have also developed over decades. Restoration of fire-adapted ecosystems on the Kaibab Plateau is essential for many benefits to multiple groups of forest users. Open stands of ponderosa pine with an aspen associate will at least be fire resistant. The Warm Fire Recovery project is the first step in this process. Monitoring and evaluation relative to post-fire recovery

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			Donato (2006) points to another specific mechanism for salvage logging impacts to ecological health. He found that modern logging practices have severe impacts on natural restocking levels, reducing natural regeneration levels of conifers by 71%. While he looked at conifers, it can be assumed that many other species were similarly impacted. Further, salvage logging is a cumulative impact to pre-fire impacts and fire-fighting, both of which could harm natural regeneration potential. Shatford (2007) found that mixed conifer forests at a variety of elevations and exposures naturally recovered from fire if left unlogged, even in areas with tree mortality greater than 90%. This occurred when seed sources were generally a few hundred yards, up to a quarter of a mile from the plots in question. The successful natural restocking densities were generally higher than the number of trees to be planted under typical Forest Service projects. The naturally regenerating conifers were able to successfully out-compete shrubs and other vegetation without human intervention. The DEIS fails to disclose modeling assumptions and inputs on pages 59-64 relating to predicted future VSS distribution across alternatives. It's critical that these assumptions and inputs be disclosed and discussed in the context of afore-described literature. To the extent that model outputs reflect opinion-based inputs, those inputs and assumptions must be firmly grounded in, or be discussed in the context of, existing literature. This discussion must also disclose the Forest Service's assumptions about replanting success, and those assumptions must be considered in the context of published literature and success rates as quantified with field measurement for replanting efforts to date in burned areas on the District (such as Bridger) and in northern Arizona. Based on published literature and the poor success rates of past planting efforts, we suspect modeling outputs relating to post-fire regeneration are largely opinion-based and overestimate the extent of regeneration that would result from action alternatives. Published literature also suggests that DEIS assumptions about post-logging, post-fire regeneration may be fatally flawed. Across	within Southwestern ponderosa pine ecosystems has become available since the release of the Warm EIS. Monitoring observations (USDA Forest Service 2008) note conditions of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. This paper evaluates the success of these areas in maintaining soil productivity and progress toward attainment of long-term desired conditions in terms of reforestation, growth rates, understory vegetation response, presence of coarse woody debris and snags, and an evaluation of the time to recovery to desired forest structure. The findings in this paper confirm the assumptions concerning vegetation recovery and logging effects that were made in designing the WFR project. The "Methodology" of the "Vegetation Resource" section of the WFR EIS discloses the modeling assumptions used. The concepts of disturbance ecology and post-fire vegetation recovery for the Kaibab Plateau were taken into consideration in the development of these assumptions. The areas selected for planting are areas that have a low probability of natural regeneration and a reasonable chance of planting survival based on existing (post-fire) conditions. It is recognized that there is going to be high levels of variation across the landscape after the Warm Fire due to aspen sprouting, variable and sometime heavy natural regeneration adjacent to existing seed sources, variable planting densities and survival in areas identified for planting and slow (in some cases 100+ years) recolonization of conifers in harsher areas with no seed sources. The reforestation project design is an effort to re-establish conifer presence and interrupt the vegetation pathway that

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			10 historic (1948-1977) stand-replacing fires in New Mexico and Arizona studied by Savage and Mast (2005), all sites had not regained substantial mature overstory components after five decades. Five of the sites shifted to shrub or meadow-type ecosystems, and five regenerated to dense thickets, indicating a relatively low resilience to crown fire. Salvage logging occurred at all 10 sites. Passavoy and Fule (2006) studied a chronosequence of seven high intensity fires surrounding Flagstaff and found that regeneration was variable. One site had no regeneration after 4 years, another converted to an oak-dominated woodland, and another is currently densely stocked with aspen. Generally, the authors found that pine survivorship declined along a 27 year chronosequence, though the oldest site (the Radio Fire) had regained 79 pines/ha. Existing post-fire recovery evidence suggests that re-planting in some sites where replacement of coniferous species may be warranted, but also suggests that we should not be overly optimistic about replanting success rates. We do not see but feel it is necessary to see within the DEIS a strong evaluation of predicted re-planting success rates, based on historic re-planting activities that have occurred across the Kaibab Plateau.	has resulted from a stand-replacing crown fire. See response to letter 19, comment 9 above regarding reforestation. Monitoring observations (USDA Forest Service 2008a) note conditions of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. Tree growth of planted trees in the recovering areas were comparable to those in unburned areas on the Kaibab Plateau and stocking to be adequate in planted areas. Natural regeneration was virtually non-existent except within 100 to 150 feet of seed sources. See response to letter 15, comment 29 regarding NNIS.
20	33	NNIS	d. Exotic/invasive plants As noted in the DEIS, logging operations will exacerbate invasive exotic plant problems within and beyond the project area. Salvage logging operations have been demonstrated to facilitate invasive plant establishment and spread by creating “safe sites” for existing or new seeds and by transporting new seeds into the project area on machines. (CWWR 1996, Beschta et al. 2004, Greenberg et al. 1994, Sexton 1998). Any increase in the abundance, extent and richness of invasive noxious exotic plants would, through competition with native species, further impair the natural recovery and regeneration of the burned area and increase the potential for exotic invasive plant spread from the project area south into Grand Canyon National Park. Although the DEIS notes that alternative 2 has the highest risk of promoting the establishment and spread of exotic invasive plants, we believe the DEIS underestimates that	

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			risk. Specifically, the DEIS has not adequately evaluated the potential for spread of cheat grass within and beyond the project area as a result of salvage logging activities. While some discussion of the Bridger salvage is included in the DEIS, the analysis needs to take a close and hard look at cheat grass invasions in logged versus unlogged areas therein. Moreover, the DEIS fails to consider indirect effects of cheat grass spread—particularly the potential for the establishment of uncharacteristically high-frequency fire regimes in the post-salvage environment, and the resulting impact that would have on post-fire regeneration, wildlife habitat, fuel loading, etc. We urge the Forest Service to work with Grand Canyon Trust to mobilize cheat grass models developed by Dr. Brett Dickson for the Kaibab Plateau in order to more substantially ascertain risks attending proposed salvage logging operations.	
20	34	Soils	e. Reliance on Mitigation Measures and BMPs In addressing the various anticipated effects to the proposed salvage logging on natural regeneration and recovery, soils, watershed and wildlife, the Forest Service may not rely on BMPs and mitigation measures in place of a full analysis. The Forest Service is required to fully analyze and disclose anticipated effects to the environment that may result from the proposed action. The Neighbors of Cuddy Mountain case provides clarification with respect to the Forest Service's duty to properly formulate and discuss mitigation measures: "The Forest Service's perfunctory description of mitigating measures is inconsistent with the "hard look" it is required to render under NEPA . . . A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA." 137 F.3d at 1380 (quoting Carmel-by-the-Sea v. U.S. Dep't of Transp., 123 F.3d 1142. 1154 (9th Cir. 1997 and Northwest Indian Cemetery Protective Ass'n v. Peterson, 795 While the use of BMPs is to be encouraged in timber salvage projects, these measures are not in and of themselves sufficient to	The analysis includes a discussion on anticipated effects of proposed activities on soils, watershed and wildlife in chapter 3. The proposed action is analyzed in terms of the soil quality standards and guidelines (FSH 2509.18).

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			ensure compliance with the law. Again Neighbors of Cuddy Mountain, "The Forest Service's broad generalizations and vague references to mitigation measures in relation to the streams affected …. do not constitute the detail as to mitigation measures that would be undertaken, and their effectiveness, that the Forest Service is required to provide." Id.	
20	35	Other	e. Defining "dead trees" Although the DEIS states that only dead trees will be eligible for removal by salvage logging, empirical data collected from the Bridger-Knoll and Slide wildfires demonstrates that less than 100% of trees exhibiting 100% crown scorch actually died three years following fires (McHugh and Kolb, 2003). (Figure 5.) Based on these data, it would be difficult or impossible to determine which trees exhibiting 100% crown scorch will ultimately survive or die, and which of those should be retained and not logged to provide seedstock, habitat and the attending biological legacy that results from residual live trees in an otherwise burned forested landscape. Based on these data, it is a distinct possibility that the few trees that may survive would be logged, foreclosing their biological contributions to a recovering forest.	In the study referenced, the total number of trees for the Bridger-Knoll Wildfire (BKWF) were 67 trees with 100 percent total crown damage (scorch + consumption). At the end of 3 years, 92.5 percent of these trees had died, 62 of 67 with only 5 trees alive. For the Slide Fire, 95 percent of the trees were dead after 3 years with a total crown damage of 100 percent so 57 of the total 60 trees with only 3 alive. So of the sampled trees, there were very few trees with that total amount of crown damage left alive 3 years post-fire. While ponderosa pine can survive 100 percent crown scorch, it does so because of how the buds are protected, either by timing of bud flush/bud set in relation to the fire. So if the fire burned prior to bud flush in the fire year, there may not be 100% bud kill, thus the new vegetation may be able to produce enough food for the trees to survive. However, if bud flush had occurred and bud hardening or bud set had not happened by the time the fire happened, then not only is the current year's best photosynthesis producing vegetation lost, but also next years, which could contribute to higher levels of mortality. All of this could be influenced by how different the individual fires were from each other. There will always be some level of uncertainty related to these questions. The trees in the Warm Fire may have been more stressed due to drought factors in the interim (pre-fire). Because of this, the severity of the BKWF and the Warm Fire may have been different, which also means the Warm Fire trees

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				may have also suffered higher levels of cambium damage, i.e., basal girdling and perhaps deeper effects to the root systems, and higher levels of bud kill, all of which may contribute to higher levels of mortality than those experienced in either the BKWF or Slide Wildfire. So, bringing in other damage factors to the tree, such as to the roots and bole as secondary decision factors may be useful. In other earlier studies, Wagner (1955/56) Dietrich (1976) may indicate that more trees with 100 percent crown scorch may show some higher survival rates, but I think you have to put their fires in the context of changing conditions, such as drought, fuels buildup, timing of fires, and the severity and intensity of their fires compared to the BKWF/Slide Fires and Warm Fire. In the study referenced, the percent volume total crown damage which consisted of crown scorch and crown consumption of the pre-fire live crown volume. Figure 4 in the paper referenced shows that almost all trees with greater than 60 percent crown consumption died after 3 years. There is a little reduction at the 80 percent level, but that is the miracle of ponderosa pine. It is resilient and can survive large amounts of crown damage. However, in the study, those numbers were very few for the timeframe studied. Effect on tree survival is influenced in the context of drought induced tree stress, collateral damage to other tree structures, such as the bole and roots, pre- and post-fire environmental factors, timing of the fire in relation to tree physiology, and location of bark beetle populations. By planning to remove only trees with 100 percent consumption and trees with 100 percent total crown damage as defined by the referenced study, the number of times a live tree would be removed that might live is likely to be rare. The project may incidentally remove a tree that may live. Yes, there is still some level of uncertainty, but the project is being very cautious on how trees are selected for removal. The fact that the project is leaving many trees

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				with lower levels of crown damage suggests that the project will likely leave many trees to provide a future seed source for regeneration, and some of those trees will die as well, providing future snags and large woody debris back to the site if this is of concern. (C. McHugh, personal communication). Trees severely scorched by the 2006 fire with no green needles 2 or 3 years later can reasonably be considered dead.
20	36	NEPA Alts.	IV. The DEIS Violates NEPA by Failing to Fully Analyze Reasonable Alternatives Proposed During the Scoping Process, Failing to Consider a Reasonable Range of Alternatives, and By Failing to Sharply Define and Provide a Clear Basis of Choice Between the Alternatives that are Considered The alternatives section is described as the "heart" of a NEPA analysis, allowing the agency to sharply define the issues and provide a clear basis for choice among options by the decisionmaker and the public. 40 C.F.R. § 1502.14. Agencies are therefore required to "[r]igorously explore and objectively evaluate all reasonable alternatives." Id. at § 1502.14(a); see also 42 U.S.C. § 4332(2)(E) (agencies required to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources"). a. The DEIS fails to examine the opportunity for research or adaptive management regarding post-fire conditions. The DEIS notes the controversial nature of salvage logging and the need for further research on the subject (P85-86), however not one alternative offers the opportunity to study the results of natural regeneration. The Forest Services' own documents caution about the need to further study the site-specific impacts of salvage logging. In addition, as stated by McIver and Starr 2000: [W]e believe that like most practices, postfire logging is certain to have a wide variety of effects, from subtle to significant, depending on where the site lies in relation to other postfire sites of	Please note that NEPA requires a "range of reasonable alternatives," not a "reasonable range of alternatives." Please refer to previous responses to comments regarding the range of alternatives. Of the 39,100-acre suppression area, alternatives 2, 3 and 4 propose treatments on a fraction of the burned areas (9,114; 5,756; and 5,541 acres, respectively). All action alternatives provide for research opportunities. In particular, to support research opportunities, 25 untreated 10-acre blocks (to be determined during project implementation) would be established for various research projects within the salvage/planting activity units for comparative studies paired with similar salvage/planting blocks. The scientific studies being considered include effects of post-fire management activities on soils/watershed, weeds, fuels, wildlife, and forest composition/structure. The objective of the studies would be to learn more about post-fire management.

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			various ages, site characteristics, logging methods, and intensity of fire. Even though additional research will be necessary to more completely understand the mechanisms behind the various effects of postfire logging, there is no substitute for the practice of adaptive management, particularly if it is undertaken with unlogged controls, replicated units, and response (monitoring) variable that can be measured with good precision. The Warm Fire burn area provides the perfect opportunity to study natural recovery.	
20	37	NEPA Alts.	b. The DEIS fails to analyze a sufficiently broad range of action alternatives, including the conservation alternative submitted by Center for Biological Diversity and Grand Canyon Trust. The DEIS considers four alternatives—one no action alternative and three action alternatives. However, there is very little difference between the three action alternatives. This is readily apparent by the DEIS's repeated combining of the "action alternatives" in its discussion and analysis of environmental impacts for virtually all forest resources. This is impermissible under NEPA. Rather, the Forest Service must "take a 'hard look' at alternatives which not only emphasize differing factors, but lead to differing results. Consideration of alternatives which lead to similar results is not sufficient under NEPA." Citizens for Envtl. Quality v. United States, 731 F. Supp. 970, 989 (D. Co. 1989) (citing State of California v. Block, 690 F.2d 753 (9th Cir. 1982)). In this case, each action alternative proposes salvage logging of large trees (greater than 14 inches in diameter) and opening closed roads. The fact that the DEIS continuously lumps together the effects analysis for the action alternatives shows that they are really only slight variations of the same alternative. The DEIS states that the preferred alternative "has been modified slightly since [February 2007] scoping" (DEIS p14). It is clear that the Forest Service did not seriously take any public scoping comments into account when drafting the DEIS alternatives and selecting the	As noted in the EIS, the suggested alternative was nearly duplicative of the "Hazard Tree Removal Along Highways and Forest System Roads and Trails in the 2006 Warm Fire Project" that was approved July 19, 2007, and is being implemented. See response to letter 20 comment 40, below, pertaining to economic analysis.

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			preferred alternative. Moreover, the DEIS fails to demonstrate how a conservation alternative proposed by Center for Biological Diversity and Grand Canyon Trust (Appendix I to these comments) fails to meet the project purpose and need. The DEIS states, "An alternative suggestion was received that included the following: limit salvage to only roadside areas in order to provide increased fire management effectiveness; increase hazard tree removal areas along open roads by 40 to 50 feet on each side of the road hazard tree project to result in clearing snags one and a half tree lengths (i.e. 120 to 150 feet) on each side of the roads; restrict salvage operations in high erosion severity areas to winter conditions; target clearing one tree length in aspen areas; thin small green trees in the low and moderate severity burn areas to set those areas up for prescribed burning in the future. This alternative was considered and is similar to the 'Hazard Tree Removal Along Highways and Forest System Roads and Trails in the 2006 Warm Fire' project. The decision for the hazard removal project was signed July 19, 2007. Alternative 3 incorporates restricting salvage operations in high erosion severity areas to winter conditions. The proposed treatments of this alternative suggestion do not meet the identified purpose and need component of recovering economic value from burned timber and effectively breaking up fuels to increase the likelihood of safe and successful fire protection efforts in the future; therefore, this alternative was considered but eliminated from detailed analysis. The no action alternative would have similar results." Specifically, the DEIS fails to demonstrate how the conservation alternative "fails to meet the identified purpose and need component of recovering economic value from burned timber and effectively breaking up fuels to increase the likelihood of successful fire protection efforts in the future. On the former issue, and as discussed in the economics section of these comments, the DEIS demonstrates that none of the action alternatives can be implemented for a net economic gain. Using the Forest Service's	

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			own standard of recovering economic value from the burned timber, none of the action alternatives meet the purpose and need and none should have been evaluated as alternatives under NEPA. Given that the Forest Service did analyze action alternatives that fail to recover economic value from burned timber, it should also have analyzed the conservation alternative. The DIES fails to provide any rationale or quantitative information describing how the conservation alternative fails to meet economic goals of the purpose and need independently or in comparison to action and no action alternatives that were analyzed. On the latter issue, and as also discussed in these comments, the fails to support the with hard data, analysis and published literature the Forest Service's opinion that a significant risk of future re-burn exists and/or warrants salvage logging. The DEIS employs models with little or no empirical foundation to generate weakly grounded assumptions regarding long-term fuel loading and fire hazard potential. Literature referenced within the document does not strongly support model assumptions or results. Conflicting science concerning potential long-term fuel loading and fire hazard conditions has not been adequately considered. Within the context of empirically weak modeling efforts, and inadequate interpretation of existing literature, the DEIS does not adequately disclose scientific uncertainties associated with effects of post-fire logging on long-term fuel loading and fire hazard potential. The Forest Service cannot simply dismiss the conservation alternative on the grounds of unproven and unlikely assumptions underpinning the project purpose and need relating to re-burn.	
20	38	NEPA Alts.	c. NEPA does not allow the Forest Service to combine all "action alternatives" together in analyzing potential impacts to various forest resources As stated, the very purpose of the NEPA requirement for agencies to consider a reasonable range of alternatives is to sharply define the issues and provide a clear basis of choice among options by the decision maker and public. 40 C.F.R. 1502.14. This is not possible, where – as here, the agency simply lumps together all the "action"	The effects discussions are combined where the results of an activity would be similar and the difference between alternatives is the amount of acres experiencing the effect. The alternative maps display the difference in areas to be treated. The decision maker considered all facets of the actions proposed in the alternatives and how each alternative addresses the purpose and need. The record of decision includes the decision rationale.

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			alternatives in its discussion and analysis of environmental consequences. While this may save time and work for the Forest Service, it fails to satisfy one of NEPA's most basic requirements. Not only must the Forest Service add to its chosen alternatives to present a broader range for the public and decision maker to assess, it clearly must analyze and disclose the differences in the various chosen alternatives in its discussion of potential environmental impacts in order to allow the public and decision maker to understand the various significant issues that are involved with this project, and to understand the differences between the "action" alternatives for purposes of environmental consequences.	
20	39	NEPA Watershed Wildlife NNIS	IV. The Forest Service failed to consider the overall, cumulative effects of the proposed action along with past, current and reasonably foreseeable connected, cumulative, and similar actions. NEPA emphasizes "coherent and comprehensive up-front environmental analysis" to ensure an agency "will not act on incomplete information, only to regret its decision after it is too late to correct." Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208, 1216 (9th Cir. 1998). NEPA thus requires federal agencies to analyze the direct, indirect, and cumulative impacts of the proposed action. 42 U.S.C. § 4332(C); 40 C.F.R. §§ 1508.7, 1508.8, 1508.25 (the scope of a proposed action must include connected, cumulative, and similar actions); Sierra Club v. Bosworth, 2007 U.S. App. LEXIS 28013 (9th Cir. 2007). Cumulative impacts include the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. 40 C.F.R. § 1508.7. A cumulative effects analysis must also provide detailed and quantifiable information, and cannot rely on general statements and conclusions. Neighbors of Cuddy Mountain v. U.S. Forest Service,	The post-fire condition is the existing condition for the WFR project. The existing condition is discussed by resource area in the EIS. Cumulative effects are analyzed in chapter 3 by resource area and included all past, current, and foreseeable future projects where information existed for the IDT to consider. In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions, of which the known actions recorded in the district databases are listed above. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects. This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain, however, a listing of known actions is provided. Current conditions have been impacted

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			137 F.3d 1372, 1380 (9th Cir. 1998). Forest Service has ignored important cumulative impacts. For example, the DEIS ignores the cumulative impact of the proposed logging and other logging currently occurring or proposed on private, reservation, or national forest land (DEIS p 41-43). The cumulative logging activities will result in detrimental environmental impacts, including increased erosion in shared watersheds and negative impacts to wildlife species. The Forest Service must also take into account the impacts of all forms of past and future wildland fire (prescribed fire, wildland fire use, wildfire) and this is entirely neglected. The Forest Service also failed to provide a meaningful discussion on the cumulative effects that would arise from increased spread of cheatgrass—including the crowding of native understory species, reduction in native pollinators and prey base for insectivorous birds, reptiles and mammals, and facilitation of unnaturally frequent fire regime. Significantly, the DEIS fails to include the past and ongoing impacts caused by the Forest Service's fire-fighting tactics in fighting the 2006 Warm Fire, including bulldozing firelines, constructing landings and safety zones, backburns, and the use of chemical fire retardant. League of Wilderness Defenders v. Forsgren, 184 F. Supp.2d 1058, 1069 (D. Oregon 2002) ("Moreover, the uncertainty is increased because the aggressive fire-fighting tactics employed by the Forest Service – 35 miles of firelines were bulldozed, and 72,000 gallons of chemical fire retardant were dumped on the Hash Rock area, including the project area – have yet to be fully analyzed.). Here, the DEIS not even disclose the extent and location of firelines and other critical information, let alone include these impacts in its cumulative impacts analysis. Simply stating that the firelines have been waterbarred – with no data or analysis to support that this would somehow wipe away all adverse affects – wholly fails to satisfy NEPA requirements. The DEIS additionally fails to fully analyze the cumulative impacts of increased invasive plant coverage within and outside the project	by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. Third, public scoping for this project did not identify any public interest or need for detailed information on individual past actions. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005, regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." For these reasons, the analysis of past actions in this section is based on current environmental conditions. The fire suppression activities contributed to the existing condition and were considered in the cumulative effects analysis for soils and water resources and noted in tables 23 and 24. See NNIS response to comments above (ltr 15 comm. 29).

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			area (these comments again urge. Of particular importance would be effects associated with cheat grass.	
20	40	Economics	VI. Economic Analysis and Effects Given that recovery of the economic value of the timber is one of the primary purposes of this timber sale, it is imperative that the analysis includes a detailed cost-benefit analysis of how much the timber is worth, how much money the forest service is receiving from the sale, as well as how much the logging company will earn from the sale of the timber. The money the Forest Service receives from this timber sale must also be compared with the estimated final cost of the recovery effort. It is likely that the cost of failed recovery will not be covered by money gained from the salvage sale. Studies have shown that the expenses to the U.S. Treasury for post-fire salvage sales are often substantially larger than the money they return.iii Relatively recent large scale salvage logging in Arizona associated with the Rodeo-Chediski Fire provides an important example. In reviewing the Draft Environmental Impact Statement for that project, we found that none of the post-fire salvage logging alternatives returned dollars to the people of the United States and in fact, every alternative, except the no action alternative, was projected to result in a net loss to American taxpayers. Alternative 2 would have a net deficit of $190,354, Alternative 3 would have a net deficit of $224,954, Alternative 4 a loss of $149,654, and Alternative 5 a loss of $219,754.iv The DEIS claims that revenue from this salvage sale will help to fund restoration and reforestation efforts. However, according to the economic analysis on page 197, all actions alternatives will result in a significant financial deficit (-$2,513,549 Alt 2; -$1,611,320 Alt 3; -$1,695,345 Alt 4), the largest deficit being for preferred alternative 2. Arguments that "net public benefits," although not quantifiable, ought to be included in this financial analysis are disputable, particularly since the great majority of comments submitted during scoping opposed the Warm Fire	The economic analysis has been updated to incorporate updated defect factors for the salvaged timber. The analysis acknowledges the known costs of the proposed project would result in negative present net values. In addition to economic considerations, the analysis considered the long-term impacts to soils and the future fuel loading anticipated. Large trees that fall to the ground become large fuels that when burned, burn for a longer time exposing the soil beneath and around them to higher levels of heat for longer periods of time than smaller diameter material (Monsanto and Agee 2008). Dollar costs associated with increased soil heating do not exist; therefore, those costs could not be factored into the analysis. Monitoring and evaluation relative to post-fire recovery within Southwestern ponderosa pine ecosystems has become available since the release of the Warm Fire DEIS. Monitoring observations (USDA Forest Service 2008a) note conditions of four ponderosa pine forest areas on or near the Kaibab NF that experienced stand-replacing fire sometime in the last 4 decades of the 20th century. Three of the areas were partially or completely salvage logged and planted. This paper evaluates the success of these areas in maintaining soil productivity and progress toward attainment of long-term desired conditions in terms of reforestation, growth rates, understory vegetation response, presence of coarse woody debris and snags, and an evaluation of the time to recovery to desired forest structure. The findings in this paper confirm the assumptions concerning vegetation recovery and logging effects that were made in designing the WFR project. Roccaforte et al. (2008) have found no conifer natural

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			salvage project. Moreover, it is likely that the Forest Service has underestimated the financial deficit that will result from this project as timber prices are likely as the economy is likely to continue to weaken. Recovery costs must include all anticipated post-logging rehabilitation required to correct or mitigate the following anticipated effects (described above in comments and listed parenthetically in bullets below): 1. replanting (crushed tree seedlings, reduced tree productivity); 2. reseeding (reducing vegetation biomass and plant species richness, destroying nitrogen fixing plants and their benefits to early-succession biological communities); 3. replanting and micro-site rehabilitation (negatively impacting micro-sites and their attendant tree regeneration); 4. weed eradication (establishment and spread of invasive, exotic noxious weeds); 5. soil reclamation (soil compaction, churning and loss of nutrients); 6. erosion control (soil erosion).	regeneration within two study areas within the Warm Fire and forest monitoring (USDA Forest Service 2008a) found very sparse conifer natural regeneration on other fires that have burned on the Kaibab Plateau. This is consistent with field observations in the Warm Fire area made by North Kaibab District employees (Domis, personal communication). Planting costs were included in the incremental analysis completed for this project. Reseeding is not proposed. Planting rates were planned at a level that accounts for some anticipated mortality as discussed below. Where salvage harvest is planned, natural regeneration was assumed reduced by 20 percent to simulate the effect of equipment impact to natural regeneration that occurred prior to harvest. This is based on the assumption that logging equipment will potentially come in contact with up to 20 percent of a harvest unit, thus could potentially kill any natural regeneration it comes in contact with. This assumption is based on the design features included in the WFR project that are intended to reduce disturbance of recovering vegetation such as: restricting skidders and other fuels treatment equipment to designated skid trails during non-winter harvest and fuels reduction activities; using existing skid trails where available; and by limiting the compaction areas. All salvage harvest units are planned for hand planting within 5 years after harvest, regardless of proximity to potential natural seed source. Funding availability, planting stock availability, nursery failures, poor initial seedling survival, unexpected natural regeneration success, unexpected animal damage, and poor soil moisture and salvage harvest delays could extend the time required to accomplish the proposed planting. This is to promote prompt, vigorous recovery of appropriate forest cover. The intent is to reforest these sites approximating historical stocking levels and species composition.

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				Seedlings will be planted in groups with irregular spacing between each group after salvage operations are completed. The planting pattern will be based on the pre-fire stand structure with groups being concentrated adjacent to where legacy trees existed before the fire. The number of trees per planting was simulated based on the number of 21-inch trees that existed in the stand prior to the Warm Fire. It was then assumed that planting 6 trees per acre for each 21-inch tree would adequately approximate historical stocking. It was also assumed a minimum of 30 trees per acre would be planted. The range of planting intensity simulated was 30 to 160 trees per acre. We assume a 20 percent mortality rate in these planted seedlings over the first 5 growing seasons. Field examinations will be conducted after salvage operations to determine the required number of seedlings needed and the appropriate mix of species for the final planting prescription. Ongoing NNIS treatments will continue to be treated as per the "Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds" (USDA Forest Service 2005). See also, response to letter 15, comment 29 regarding NNIS. Incorporation of BMPs to address soil resources is factored into the general administration costs of the project and considered in the incremental economic analysis.
20	41	Economics	To demonstrate the economic feasibility and effects of the Warm Fire Salvage project, the Forest Service must also engage in an economic efficiency analysis that "adds other economic costs and benefits that are not part of Forest Service monetary transactions." FSH 2409.18.12.2. (See for instance Niemi and Whitelaw, [1997].)2 This includes all marketed and non-marketed benefits and costs to all those who derive economic value from the lands	A comprehensive economic efficiency analysis was not completed for this site-specific individual project. An incremental economic analysis was completed for the WFR project that looked at the values that were anticipated to differ between alternatives, for factors where values were available. The factors cited in the comments were impacted by the Warm Fire event and the resultant changed conditions and were not anticipated to differ measurably

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			affected by the project: 1. recreational opportunities and tourism; 2. recreational fisheries within the boundaries of the Kaibab National Forest and downstream; 3. habitat for important game species and hunting both within and outside of the Kaibab National Forest; 4. habitat for species sought by birders and other wildlife viewers; 5. enhanced property values; 6. clean water for communities downstream from the Kaibab National Forest; 7. regulation of water flowing through rivers and streams, including flood control; 8. non-timber forest products such as wild mushrooms, herbs, and medicinal plants; 9. biological resources that either have value now or have as yet unknown but potentially large economic and social value; 10. biological and genetic resources that can improve the long-term productivity of all forest land; 11. pest-control services provided by species that prey on agriculture and forest pests, and; 12. pollination services provided by species that pollinate important forest and agricultural crops. The Forest Service must fully analyze, but may not constrain economic analysis to, the anticipated costs and benefits incurred by the wood products sector. FSH 2409.18.32.2.	between alternatives, or no values were available. The environmental effects were analyzed and disclosed in the EIS by resource area.
21	1	Other	The Arizona Game and Fish Department (Department) appreciates the opportunity to comment on the Draft Environment Impact Statement (DEIS) for The Warm Fire Recovery Project. As you are	Statement introducing comments on the EIS. No response needed.

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			aware, the North Kaibab Ranger District (NKRD) provides important and rare wildlife habitat components to which the Arizona Game and Fish is responsible to conserve, enhance, and restore. While the Department fully appreciates the complexity of this issue, and the difficult task in balancing ecological, economic, and social factors within project we have some concerns related to the habitat conditions that may be a result from implementing the proposed action (Alt 2) in the DEIS. We offer our comments formally in this letter and encourage open discussion of our concerns between agencies:	
21	2	Other	Eastside pinyon-juniper habitat: In our initial letter dated January 26, 2007 the Department stated that we were concerned over the Eastside portion of the fire, which occurred in the pinyon-juniper ecosystem. As per the DEIS, this area is currently listed within the recovery footprint. We further defined that this area is especially important for mule deer, primarily during winter. Lastly, we made a request that the Forest Service (FS) explore options for recovery of this area as part of the DEIS due to the loss of non-fire adapted winter browse species such as cliffrose, 4-wing saltbush, and sage spp, and the potential for major cheatgrass invasion. Since the release of the DEIS our concerns continue. While we appreciate that the FS included some information related to the pinyon and juniper ecosystem in the DEIS with respect to vegetation conditions both pre and post fire, it has been sorely under represented and analyzed. This under representation lends itself to confusion regarding recovery efforts. For example, on page 5 of the summary section, it states under restoring the structure and function of the forest: that there is a need for "planting of browse species for mule deer winter and transitional range on the east side of the fire". The document then goes on to say on the next page that "planting browse species (e.g. cliffrose) in areas where browse species were consumed by fire to benefit deer" is instead an "ongoing action being considered under	Planning and implementation of an additional habitat improvement project is something that the NKRD could consider in the future, but is outside the scope of WFR project planning and analysis. Please refer to the "Warm Fire Rehabilitation and Recovery Plan and Status Summary" (which is maintained on the Kaibab NF's Web site) for a comprehensive summary of all the various programs and projects in the Warm Fire area, including wildlife and weed management activities. See response to letter 15, comment 29 regarding NNIS.

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			separate environmental reviews within the Warm Fire area". The Department requests clarification on whether there are any plans specifically within the DEIS to assess the effects of the Warm Fire on the pinyon juniper ecosystem, and consequently any plans to conduct habitat work and weed treatments on the eastside of the project	
21	3	NNIS	The Department would like to recognize the efforts by the NKRD range staff in their active approach to treating cheatgrass on the eastside of the fire perimeter occurring outside of this Warm Fire recovery effort. While we encourage continued aggressive management on this front, this effort alone is not enough to treat the anticipated flourish of cheatgrass. Lastly, the Department recommends that the FS utilize information generated by the Grand Canyon Trust's cheatgrass model, which explicitly shows the likely infestation of cheatgrass on the eastside. This information could help adaptively guide where treatments may occur.	See response to letter 15, comment 29 above regarding NNIS.
21	4	Wildlife	Wildlife Effects Analysis: Juniper titmouse: A further clarification of the fact that the pinyon juniper ecosystem has been virtually ignored relates to the juniper titmouse. The juniper titmouse is listed as a management indicator species "whose analysis will be carried forward" (Table 37. page 109). The titmouse is then discussed within the Affected Environment section on page 114, yet nowhere later in the document (likely should have been on or around page 141) could we find a direct and indirect effect analysis on the juniper titmouse. With large fires on both the west and east sides of the NKRD (Bridger Knoll and Warm Fire, respectively), there needs to be further analysis on the effect of the loss of pinyon and juniper on the juniper titmouse.	The project does not include activities in pinyon-juniper woodland habitat. Effects to juniper titmouse have been analyzed and are documented in the wildlife report.
21	5	Wildlife NNIS	Mule deer: With respect to the Direct and Indirect Effects as they relate to deer, the Department would like to clarify the effect of No Action Alternative (page 137). The document states that under the	The project does not include activities in pinyon-juniper woodland habitat.

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			No Action there would be "no additional impediments to natural shrub regeneration". Assuming that the project area does in fact include the pinyon and juniper areas as the currently DEIS states, this statement is false. Evidence in the fire literature as well as "on the ground" indications from the westside of the NKRD, suggest that cheatgrass will likely establish which becomes a significant impediment to shrub regeneration. If we are to assume that this discussion relates to shrubs in the higher elevations ponderosa pine, be informed that mule deer in the higher elevations (during summer) rarely eat shrubs, but instead rely on early successional species such as grasses and aspen shoots, which respond positively to fire. Under the cumulative effects section (page 138), it states that there are "habitat improvement projects that would benefit mule deer (Table 45). Enhancement of cliffrose, and seeding and regeneration of other browse species would improve mule deer winter range east of the project activity areas". We assume that the authors are referring to the Westside Habitat Improvement Project (listed in Table 45), which is currently seeding native browse species due to impaired habitat conditions from past fire and cheatgrass infestation. While these efforts on the westside will likely help winter habitat conditions for deer, the cumulative effect of the Warm Fire will add to the negative effects on mule deer winter range wide. Due to the cumulative negative effect to winter browse, the Department strongly urges that the NKRD seriously consider planning and implementation of similar effort to the Westside Habitat Improvement Project.	Thank you. Impacts to mule deer from the no action will be addressed. See also response to letter 20, comment 23 above regarding wildlife analysis. We agree that cheatgrass invasion in pinyon-juniper and sagebrush habitat is highly problematic, as mentioned on the west side of the Kaibab Plateau in the Bridger-Knolls Fire area. The Kaibab NF is pro-actively responding to this threat in the pinyon-juniper habitats burned by the Warm Fire. More specific information on these efforts is provided in the "Warm Fire Rehabilitation and Recovery Plan and Status Summary," which has been available on the Kaibab National Forest Web site and is updated periodically. Planning and implementation of an additional habitat improvement project in conjunction with the Arizona Department of Game and Fish is something that the NKRD could consider in the future, but is outside the scope of WFR project planning and analysis. See response to letter 15, comment 29 regarding NNIS.
21	6	NEPA	Justification of the proposed action: Throughout the document Alternatives 2, 3, 4 are lumped together in several places (e.g. direct and indirect effects on soil hydrology, nutrient cycling, soil stability, cumulative effects to watersheds), therefore not justifying that the proposed action may be the most beneficial to the ecosystem. In order to clearly convey the decision rationale to the public, we would recommend that analysis reflect	The effects discussions are combined where the results of an activity would be similar and the difference between alternatives is the amount of acres experiencing the effect. The alternative maps display the difference in areas to be treated. The decision maker considered all facets of the actions proposed in the alternatives and how each alternative addresses the purpose and need. The record of decision includes the decision rationale.

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			why Alternative 2 is the strongest alternative so that they can understand the FS decisionmaking process to date.	
21	7	NNIS	Within the Direct and Indirect Effects analysis of nonnative invasive plants (NNIS), the issue of the justification for Alternative 2 is also confusing. The document states that the Proposed Action is in fact the Alternative that "proposes to treat the most acres and therefore poses the strongest risk of the spread of NNIS of all the action alternatives". While the Department appreciates the honest disclosure of the effect of ground disturbing activities, we believe that weed issues have not been addressed sufficiently throughout the document. This concern primarily relates to cheatgrass on the eastside, which we described earlier in this letter.	Please refer to the response to comment 21-5, above. We understand the department's primary concern is in big game winter range habitat on the east side of the plateau in the pinyon-juniper habitat that is most vulnerable to cheatgrass invasion (lower elevations than the ponderosa pine and mixed conifer habitat in the Warm Fire Recovery project). See response to letter 15, comment 29 regarding NNIS.
21	8	NEPA Fuels	Lastly, the justification for the Proposed Action related to the salvage operation also seems unconvincing, especially with respect to fuel loading (small woody fuels and coarse woody debris). Several times in the document it seems that there is little difference in fuel loading between any of the alternatives (including the No Action) from present to 30 years later. These Alternatives seem to be very similar until the data is derived from 40 years post fire. If fuel loading becomes an issue primarily after 30-40 years, the Department would recommend that the FS look in to long-term planning for alternative fuels reduction methods (prescribed fire, removal of fuel by fuel wood cutters, and/or mastication) as an alterative to solely focusing on salvage operations.	Breaking up the future large fuel component is one of the purposes for the WFR project. Regarding the suggestion to consider prescribed burning in the Warm Fire Recovery in lieu of salvage logging. There are several reasons why this option is not studied in detail in this EIS, as follows. First, a notabale component of the large fuels that are currently standing snags would need to fall down and accumulate on the surface prior to conducting the prescribed fire. That process will take a decade or more for approximately half the fire-killed trees to fall, and 2 decades or more for the vast majority of snags to fall (Passavoy and Fule, 2005). The NEPA process is based on studying actions that are ripe for decision. Prescribed burning actions that are a decade or more away are not ripe for decision. Second, there is a need to establish conifer regeneration in the burned area via planting where seed sources have been lost. The conifer seedling planting would have to be

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				delayed for a decade or 2 until after the prescribed fire treatments occurred, otherwise the burning would kill the conifer regeneration and waste the planting investment. Third, if prescribed fire were to be used to reduce the large surface fuels a decade or 2 hence, soil heating effects and root damage to the recovered vegetation in the burned area would have undesirable effects (Monsanto and Agee, 2008), setting back the Warm Fire burned area recovery process. Use of prescribed fire in 5 to 10 years on sites recently burned for an alternative was considered in the EIS. Fine fuels to carry a prescribed burn are lacking across many of the project area acres. Over the next 5 to 10 years, the large diameter fire-killed trees would be difficult to ignite due to a lack of fine fuels to carry fire across the area. The North Kaibab Ranger District contains many overstocked acres that have not experienced recent fuels treatments or wildfire events to reduce surface fuels. Areas outside the Warm Fire area would be a higher priority for fuels treatments, such as thinning and prescribed burning. The forest plan provides direction for use of prescribed fire and future prescribed burning proposals would be analyzed when developed based on the site-specific conditions present at that time. The Forest Service does not conduct site-specific National Environmental Policy Act analyses 5 to 10 years in advance of proposed management action. This alternative was considered but found not to be ripe for analysis and was not considered in detail. Additional fuels modeling was completed for the EIS to help display anticipated differences between alternatives. The forest plan guides actions to occur on the Kaibab National Forest. The WFR project was designed to be a first step in the overall recovery for areas affected by the

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				Warm Fire. Future projects may be proposed to address future situations to move the area toward the desired conditions as described in the forest plan.
21	9	Wildlife	Salvage operations: While the Department understands some local economic benefit from salvage logging, we also ask that the FS consider the biological value of standing burned timber for wildlife such as cavity nesting species. We remain concerned about the potentially negative effects of salvage on a variety of forest dependent species. For example, Lindenmayer and Possingham (1996) contend that traditional salvage logging removes a high percentage of the largest dead woody structure on a given site and therefore can significantly change post fire habitat for wildlife". Because of this issue, the Department re-emphasizes that when leave-snags are designated that they be within the largest diameter classes. In addition, in a survey of 23 burns across western forests in 7 states Kotliar et al. (2002) noted that despite the wide geographic area and great variety of forest types many species showed remarkably consistent patterns". That pattern was that "severely salvaged burns may decrease the suitability of post fire forests for most cavity nesting species. Because the effects of partial salvaging were more equivocal, the Department urges the FS to look at an adaptive approach to the effect of salvage on the NKRD. This could be achieved by monitoring the effects of an initial salvage and determining whether effects to ecosystems were significant.	This project recognizes the roles snags and down coarse woody debris play in the ecosystem, and proposed actions incorporating maintaining snags and coarse woody debris through project design and the project design features. A relatively small portion of the fire area is proposed for salvage logging (about 23 percent), and in the areas proposed for salvage logging, five to seven of the largest snags per acre would be retained in clumps. A great deal of burned habitat would be left unsalvaged in the fire area. Current literature on snags and down logs, and effects of salvage logging on cavity-nesting species was considered in the impact analysis for these species. This is documented in the project wildlife reports. Habitat for certain birds and other wildlife that use snags will be plentiful, even with implementation of the preferred alternative. About 30,000 acres of the fire suppression area would have no snags removed, and all of the snags created in the 20,000-acre fire use area are also being retained. Post-fire habitat and the species that use that habitat type are discussed in the BE, BA and wildlife reports. Impacts of post-fire logging to these species is analyzed and documented in those same reports.
21	10	Economics	Lastly, we ask the FS to critically evaluate any salvage operations with respect to potential delays in the NEPA decision. Recognizing that there is a balance of timing of salvage and deterioration of economically viable timber, we ask the FS to re-analyze and perhaps modify the Economic efficiency assessment as it relates to declining timber value.	The economic analysis has been updated to factor in updated defect estimates due to timing of potential salvage logging. See also response to letter 20, comment 40.

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22	1	Other	Please find the enclosed 170 postcards signed by Sierra Club members and activists opposing the Warm Fire salvage project.	A total of 179 cards were received in the enclosure, 1 was blank, 2 had signatures without addresses, and one duplicate submission for a total of 174 postcards with names and addresses.
22	2	Alt. 1	Form post card: I strongly urge the Forest Service to allow the Warm Fire region to recover naturally, rather than open this sensitive area to logging. Most of the areas in this 60,000-acre perimeter fire are already recovering. Salvage logging will impede recovery goals by removing large trees most needed for wildlife habitat, by disturbing fragile soils, and by increasing fire risk to communities and forests as small trees and slash are left behind. This region is within miles of the famed North Rim of Grand Canyon National Park, making it even more imperative that the Warm Fire area be treated in a manner that respects the integrity of the ecological systems. Salvage logging is done at a financial loss to taxpayers, increases fire risk to communities and forests, and further damages burned forests. We need natural recovery and real solutions, not salvage logging.	Comment noted. The no action alternative is analyzed. Rationale for the decision is documented in the record of decision.
23	1	Heritage	After reviewing your consultation documents, HPD-TCP has concluded the proposed undertaking/project area will not impact any Navajo traditional cultural properties or historic properties.	Statement noted.
23	2	Heritage	However, if there are any inadvertent discoveries made during the course of the undertaking, your agency shall cease all operations within the project area. HPD-TCP shall be notified by telephone within 24 hours and a formal letter be sent within 72 hours. All work shall be suspended until mitigation measures/procedures have been developed in consultation with the Navajo Nation.	A project design feature is included to address discovery of undocumented sites.

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24	1	Wildlife	Much of the acreage proposed for salvage logging is also Mexican spotted owl (Striz occidentalis lucid a) (MSO) habitat and designated critical habitat. Under the· proposed action, approximately 3,460 acres of MSO critical habitat would be salvage logged. Out primary concerns with the proposed action deal with potential effects of the project on recovery and resiliency of MSO habitat within the project area. Removal of large amounts of coarse woody material may inhibit, and lengthen time to recovery, of the habitat. We offer the following comments. Questions and Clarification Needs Page 11. The Existing Condition section here and several other sections where similar information is presented are confusing and potentially misleading. Care should be taken in using the terms "potentially forested" and "non-stocked" when describing cover types that existed prior to the fire. This section could be interpreted to mean that only two percent of the project area was or could be mixed conifer cover type. However, the amount of mixed conifer cover type in the project area was much greater than two per cent prior to the Warm Fire. We recommend the EIS emphasize that a recovery goal is to restore the original extent of the mixed conifer cover type to mixed conifer. Page 12. The DEIS suggests that 10-30 tons per acre is the desired fuel condition in the mixed conifer cover type. However, there is no explanation here or elsewhere in the DEIS why it would be the desired condition for Mexican spotted owl (Strix occidentalis lucida) (MSO) habitat and critical habitat. We recommend the EIS describe and discuss how this particular fuel level will assist in achieving recovery of MSO habitat after the Warm Fire. Page 12. Although 10-30 tons per acre are given as the desired fuel condition, the DEIS states that achieving those levels is not realistic given the scale of the fire and economic limitations. It also states it is desirable to make substantial progress toward these levels in stands that were lethally scorched. Given these statements, it is not clear what amount of important woody	See responses to letter 15. Comments submitted reiterate comments submitted in letter number 15.

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			material will be left to aid in the stability and recovery of mixed conifer. We recommend the EIS clearly indicate how much woody material (in all categories and size classes) will be left in mixed conifer with an evaluation of how that amount is sufficient to lead to direct recovery of MSO habitat. Page 12. The DEIS states that future bum severity is not expected to be high until after 30 years due to accumulations of duff and decay of downed material fuels. Yet it also indicates that there is a need to make progress toward breaking up continuity of potential large fuels in areas that experienced moderate/high and high bum severity in order to increase the likelihood of safe and successful fire management efforts of future fires. Although it is not in the DEIS, the preliminary DEIS states that the areas should have a strategic spatial arrangement, and there is a need to provide areas for relatively safe and effective management of future fires. If future fire is largescale/high concern, we recommend the EIS include the strategic spatial arrangement and management was developed in earlier documents. Page 13. The Wildlife section indicates that criteria used to determine whether an area would be appropriate for treatment included reserving large blocks of snags and travel corridors for certain birds and other wildlife species that utilize snags and snag-dominated habitat. These areas were combined with 100-foot buffers along drainages identified in the USGS National Hydrography Dataset stream layer, and would provide habitat with no ground disturbance or snag removal within the project area. This analysis and its results are not presented in the DEIS, and we have not seen them in any other forum or context. We would like to receive the analysis and results, and recommend they be included in the EIS and/or the biological assessment. Page 13. The DEIS describes salvage on slopes in different ways. These descriptions are not clear to us, and we recommend clarifying the EIS as to the extent to which activities will occur on which slopes.	

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			Page 14 and 20. The description of slash treatments and where they will occur in salvage-logged areas varies somewhat. How many acres of MSO habitat will receive which slash treatments? Page 25. In the description of Alternative 4, the DEIS states that salvage harvest would not occur in stands designated as MSO habitat. However, it also states that in stands that were previously mixed conifer, five to seven snags per acre would be left. Because mixed conifer is MSO habitat, we do not believe that leaving five to seven snags is equivalent to no salvage logging. We recommend the EIS clarify the description of this alternative. Page 28. We recommend clarifying the discussion about use of equipment and use of existing, designated, and new skid trails to better describe proposed uses and restrictions. Page 29. The DEIS states that operation of equipment will be restricted when soil conditions are such that accelerated soil erosion, excessive soil surface displacement, or excessive compaction would occur. We recommend describing those soil conditions and how this action will reduce or prevent accelerated soil erosion. Page 32. Some conservation measures for the California condor are presented on this page in two different sections. Other different measures are presented in the California condor section in Chapter 3. We recommend that all such measures for the condor be gathered in one place in the EIS so that a reader would be able to determine the complete set of measures. We also recommend development and implementation of a condor conservation measure to prevent/address vehicle fluid spills. Pages 32 and 35. The DEIS indicates that at least seven large logs per acre will be left in MSO habitat. However, Table 5 indicates that some unknown number of downed logs will be left above forest plan direction. We recommend that the EIS clarify the amount of downed logs that will remain in MSO habitat after the proposed action.	

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			Page 34. Item number 6 and the subsequent paragraph refer to removal of woody material to prevent fires. If future fires are of major concern in the recovery of the project area, then including scheduling of prescribed fire to address that concern should be made part of the proposed action. Many Forest Service projects include single-event and even a series of prescribed fires that are scheduled far into the future. Including provisions to conduct prescribed fire at the right time as an aspect of recovery of the project area seems more reasonable than removing woody material due to concern for fire that may occur far in the future. Woody material is important to stability and recovery of the area. We recommend the proposed action include provisions for prescribed fire as necessary to reduce fire threat rather than immediate removal of woody material that is necessary for recovery of the project area. Page 35. Table 5 indicates that winter harvest on soils rated for severe erosion is "optional" for Alternative 2 (7,592 acres) and Alternative 4 (4,350 acres.) We recommend clarifying the intent. If winter harvest is part of those alternatives it should be so stated. If winter harvest is not part of those alternatives, the EIS should clearly state how many acres will be treated. Page 35. Although Table 5 indicates a certain minimum amount of coarse woody debris (CWD) will be left in the project area, the DEIS is not clear about the amount of woody material that will be left to promote recovery of MSO habitat. For example, the EIS states that most, if not all, of the woody material was consumed by the fire in mixed severity and high severity areas. One passage of the DEIS states that in forested ecosystems, a minimum of 10 to 15 tons per acre of down CWD should be managed for in the moderate to high burn severity areas. Another passage indicates that the desired fuel condition in mixed conifer is to have 10-30 tons of CWS per acre in mixed conifer. However, the DEIS states that achieving those levels over extensive areas is not realistic	

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			given the scale of the fire and economic limitation. It then states that it is desirable to make substantial progress toward these levels in stands that were lethally scorched. The DEIS also indicates that a minimum of 10 to 30 tons per acre of CWD greater than 3 inches in diameter should be left.	