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March 30, 2009

36 C.F.R. 215 APPEALS

U.S. Certified Mail – Return Receipt Requested

Appeal Deciding Officer
Mike Williams, Forest Supervisor
Kaibab National Forest
800 South Sixth Street
Williams, AZ 86046

APPEAL OF JACOB RYAN VEGETATION MANAGEMENT PROJECT

"The uneven-aged stands … have an abundance of trees in the smaller size classes (VSS 1 – 3), and need to be thinned to achieve the desired balance."

- *Vegetation Resource Specialist Report for the Jacob Ryan Project*, p.28

"Both the project area (19%) and the ad hoc area (15.7%) appear to have deficits in mid-age forest (VSS4) structure."

- *Jacob Ryan Vegetation Management Project Envronmental Assessment,* pp.112-113

"On a stand basis, canopy cover does not meet the 40% requirement desired for cover. However, within groups and clumps … this guideline can be maintained."

- *Vegetation Resource Specialist Report for the Jacob Ryan Project*, p.14

"For future projects that are just beginning or are in the analysis state, we are considering applying many of the concepts and tools that we have recently discussed with Richard Reynolds and that were also discussed during the goshawk workshop. This will lead to a much more open forest over time than previous interpretations of the goshawk recommendations in the forest plans would have."

- *Mark Herron email to Stu Lovejoy and Marlin Johnson*, 11/20/2006

"[L]oss of acreage within the 40-60% canopy class is correlated with goshawk territories becoming inactive."

- *Ward et al., Canopy Density Analysis at Goshawk Nesting Territories on the North Kaibab Ranger District, Kaibab National Forest (1992),* p.6

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Dear Mr. Williams,

Pursuant to 36 C.F.R. § 215, the Center for Biological Diversity and the Grand Canyon Chapter Sierra Club (collectively "Appellants") hereby appeal the Decision Notice and Finding of No Significant Impact for the Jacob Ryan Vegetation Management Project ("Jacob Ryan Project") in the North Kaibab Ranger District of the Kaibab National Forest ("KNF"). The legal notice of decision published in the *Arizona Daily Sun* on February 11, 2009, making this appeal timely per 36 C.F.R. § 215.15. Appellants provided the Forest Service with substantive comments regarding the Environmental Assessment ("EA") for the Jacob Ryan Project on December 5, 2008, *see* EA Appendix I, and have standing to appeal per 36 C.F.R. § 215.13.

Appellants support the purpose and need for action "to reduce ladder fuels, fuel loads, and fire-flame lengths to better manage fires in the project area," and "to reduce stand densities to promote … uneven-aged forest structure." EA at 8. The 2006 Warm fire immediately south of the Jacob Ryan Project area demonstrated the urgency of active management consistent with the purpose and need to restore ponderosa pine forests on the Kaibab Plateau. That disturbance event significantly changed forest structure, watershed condition, and habitat availability for threatened wildlife at a very large spatial scale (~58,000 acres). Furthermore, as we noted in EA comments, ongoing climate change ensures that wildland fires will become larger and more frequent at a landscape scale (Running 2006, Westerling et al. 2006). Without a commitment to restoring natural fire process on relatively short rotations compared to the suppression era and within an envelope of acceptable risk, the Forest Service manages for large scale, high intensity fires that escape initial attack during extreme weather, creating unacceptable risks to human life and resource values. For these reasons, we strongly endorse active management of vegetation and fuels in the Jacob Ryan Project. In our view, the EA demonstrates a need for management to reduce hazardous fuels and small tree density. *See generally* EA at 8-11, 14-16, and 31-32.

However, the Forest Service has <u>not</u> demonstrated a need to remove mid-aged trees larger than 12 inches in diameter at breast height (>12" dbh). The Jacob Ryan EA fails to respond to substantive comments provided by appellants demonstrating the importance of conserving those elements of forest structure representing the best recruitment potential for old growth forest characteristics that are currently deficient at every spatial scale. *See* EA at 37. The Decision Notice ("DN") authorizes (or does not forbid) removal of trees as large as 18" dbh in all ecological settings within the project area, including in northern goshawk nest stands and in even-aged stands created by past logging, where very few trees larger than 12" dbh exist. DN at 6-7; EA at 30 and 65.

The project record reveals that Forest Service reasons for rejecting limits on tree cutting in size classes larger than 12" dbh are counter to information in the project record, and therefore arbitrary and capricious. Alternative 3, which would conserve trees >12" dbh, meets the purpose and need by reducing stand densities to improve wildlife habitat diversity and forage production, and by removing surface and ladder fuels that pose an extraordinary hazard of severe fire. The Forest Service rejected that alternative without much of a rationale other than unsupported conjecture about tree growth rate acceleration and "progress" toward desired vegetation structure it claims can only result from cutting trees as large as 18" dbh. The rationale for cutting such large trees collapses under the weight of agency misapplication of standards and guidelines in the

Kaibab Forest Plan ("KNF Plan") for northern goshawk habitat, and it ignores important aspects of the management problem, such as what quality and distribution of goshawk habitat will exist after implementation of the proposed action.

The Forest Service frames the project as one that protects existing large trees (>18" dbh) and promotes their development in the future. However, assumptions in the EA regarding ponderosa pine regeneration and growth are poorly supported and fail to meaningfully address scientific information supplied by appellants showing that severe and prolonged drought driven by ongoing climate change will inhibit forest growth in the southwest region including the Jacob Ryan Project area (*e.g.*, Brown and Wu 2005, Savage et al. 1996, Seager et al. 1997).

Appellants would not appeal the Jacob Ryan Project if it avoided irretrievable loss of larger trees that support habitat for sensitive wildlife and offer the best recruitment potential for mature and old forest structures in an era of climate-impaired tree regeneration and growth. Removal of such trees may cause irretrievable losses of future mature and old forest structure, is highly controversial, and poses uncertain risks to northern goshawk survival. We insist that an environmental impact statement ("EIS") is required to move forward with actions authorized by the Jacob Ryan DN.

The purpose of this appeal is to conserve larger trees on the Kaibab Plateau for future old growth recruitment, and to prevent the Forest Service from violating KNF Plan standards for goshawk habitat in ways that may jeopardize the sensitive raptor and fundamentally change plan outcomes without observing required amendment procedures.

TITLE OF DECISION DOCUMENT: Decision Notice and Finding of No Significant Impact for the Jacob Ryan Vegetation Management Project.

DATE DECISION PUBLISHED: February 11, 2009.

DESCRIPTION OF PROJECT: Mechanical thinning and prescribed fire on approximately 26,000 acres consistent with Alternative 2 (Proposed Action) in the Environmental Assessment.

LOCATION: Townships 38, 39, 40 North; Ranges 1, 2, 3 East and Range 1 West; Gila and Salt River Meridian, Coconino County, Arizona.

DECIDING OFFICIAL: Timothy Short, North Kaibab District Ranger, Kaibab National Forest.

APPELLANTS:

Center for Biological Diversity (lead appellant)
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APPELLANTS' INTEREST

The Center for Biological Diversity has over 200,000 members and online activists and is headquartered in Tucson, Arizona. The Grand Canyon Chapter of the Sierra Club, headquartered in Phoenix, has over 12,000 members in the state of Arizona.

Appellants have consistently demonstrated their specific interests in the Jacob Ryan Project for nearly a decade. Appellants expressly indicated interest at the earliest stages of planning by providing scoping comments in response to the proposed action on November 21 and November 22, 2007, *see* EA Appendix G, as well as timely and substantive comments responding to the EA on December 5, 2008, *see* EA Appendix I. Moreover, appellants commented on prior iterations of the Jacob Ryan environmental analysis and successfully appealed an earlier decision to implement the project. Appellants have a long history of interest and involvement with this proposed action, and may appeal under 36 C.F.R. § 215.13.

The Jacob Ryan Project, as approved in the DN, will adversely affect appellants' interests in the use and enjoyment of forest and meadow environments in the project area for recreation including hiking and wildlife observation, pursuit of aesthetic pleasure and spiritual fulfillment, and education about the natural world. Appellants' members and staff regularly visit the Jacob Ryan Project area to encounter forests, view wildlife, and study the ecology and natural history

of the Kaibab Plateau. Appellants particularly value trees that provide suitable and potential recruitment habitat for sensitive wildlife including northern goshawk. Appellants recognize and assert that such trees (especially those >16" dbh) are exceedingly rare in southwestern ponderosa pine forests and represent the best recruitment potential for future old growth characteristics that are currently deficient compared to historical and desired conditions at landscape, forest, management area, and project scales. Appellants' members and staff will continue to visit the Jacob Ryan Project area and wish to maintain larger forest structure for future generations of all species to use and enjoy. Appellants' interests and activities will be irreparably damaged by logging of larger forest structure approved in the Decision Notice but precluded by Alternative 3 in the Jacob Ryan EA, which was not selected by the North Kaibab District Ranger.

Furthermore, appellants possess the right and are specifically incorporated to demand Forest Service compliance with applicable environmental laws and agency policies, including the National Forest Management Act ("NFMA" - 16 U.S.C. § 1600 *et seq.*) and the National Environmental Policy Act ("NEPA" - 42 U.S.C. § 4332 *et seq.)*, as well as implementing regulations for both statutes.

Appellants are non-profit grassroots conservation groups dedicated to protecting and restoring the West's deserts, rivers, forests, and wildlife. As part of this mission, appellants advocate for public land management that will preserve the remaining mature and old growth forests, restore degraded watersheds and forest ecosystems, and protect wildlife species that inhabit public lands. Appellants also actively support and assist forest management activities that promote self-sustaining ecological function including energy and nutrient flows and wildlife habitat heterogeneity mediated by natural disturbance processes including wildland fire.

MOTION FOR STAY

An automatic stay of project implementation is in effect per 36 C.F.R. § 215.9. However, appellants only move to stay implementation of the specific portions of the Jacob Ryan Project that would result in cutting or removal of trees larger than 12" dbh from their present locations. All other elements of Alternative 2, as approved in the DN, may proceed without opposition or request for stay from appellants, including:

- Mechanical thinning of trees smaller than 12" dbh in all treatment strata.
- Prescribed fire operations throughout the project area.

The specific actions subject to appellants' motion for stay include sale preparation and layout, tree marking, sale advertisement and auction, logging, or other site preparation or ground disturbance by the Forest Service or any contractor that could result in cutting or removal of trees 12" dbh and larger from their present locations pending the final administrative decision on this appeal. A stay of actions subject to this motion for stay is needed to prevent irretrievable commitments of important environmental resources, harm to appellants' clearly articulated and amply documented interests, and unnecessary expenditure of taxpayers' money in implementing a project that violates federal law and policy. To proceed before a final disposition on the merits of this appeal would unnecessarily expose the government to liability should a court find fault

with the Decision Notice and supporting analysis. In contrast, a stay will maintain the status quo. The Forest Service should stay the activities subject to this motion.

REQUEST FOR RELIEF

1. Withdraw the Decision Notice for the Jacob Ryan Project insofar as it authorizes component actions subject to appellants' motion for stay.

2. Respond to the significant issues described in the statement of reasons below by modifying the project as appropriate.

3. Prepare an EIS subject to 40 C.F.R. § 1502 *et seq*. to properly disclose environment impacts of component actions subject to the motion for stay in accordance with NEPA.

REASONS

I. The Jacob Ryan Project Violates NFMA By Implementing New Goshawk Guidelines Without First Preparing a Forest Plan Amendment to Incorporate the Guidelines.

On December 16, 2005, the Kaibab Forest Supervisor transmitted to the North Kaibab District Ranger a revised *Implementation and Interpretation of Management Recommendations for the Northern Goshawk, Version 2.1* ("KNF I&I" – USDA 2005), which significantly changes how the Forest Service manages northern goshawk habitat from the standards and guidelines in the KNF Plan. *See, e.g.*, Jacob Ryan EA at 121 (Forest Service admits that "Currently, canopy cover is evaluated at the stand level because our data is measured at the stand or site level"); KNF I&I at 1 ("In the past [determination of goshawk habitat management opportunities and description of existing conditions] has been done through an interpretation of the stand data that presents averages for a stand. These averages were again interpreted to derive a vegetative structural stage (VSS)"); Reynolds et al. (1992:90) (scientific basis for KNF Plan guidelines links VSS to "the specific diameter distribution of the stand"); EA at 141 (KNF I&I shifts management of canopy cover in older VSS classes from stands to groups because "In stands, it is difficult to achieve 40-70% canopy cover"); KNF I&I at 1-2 (describing need to shift management of VSS distribution from stands to groups to promote within stand (site) diversity and maximize group dispersion); EA at 158 (Forest Service admits in response to EA comments that it will "rarely" apply canopy guidelines to stands in the Jacob Ryan Project). The Forest Service admits that the KNF I&I significantly changes standards and guidelines for goshawk habitat those that amended all Forest Plans in Region 3 including the KNF Plan (USDA 1996):

> We would like "A" densities to be indicative of sites capable of producing a relatively large amount of forage or of regenerating robust seedlings. We would like the "B" densities to indicate sites that are higher than "A" densities but are still not completely occupied with trees. This would leave fully occupied sites in the "C" category. <u>We therefore developed our own VSS thresholds for project analyses which are more indicative of function, at least for the Kaibab NF, than those in the Region 3 model</u>.

KNF I&I at 9 – emphasis added.

Stands (or sites) range in size from 30 to 100 acres. S*ee* KNF I&I at 8 (equating stands with sites); USDA (2006:8 – Table 4) (describing "sites up to 100 acres in size"); and Youtz (2006:6) (describing goshawk "nest stands" as 30 acres in size). In contrast, groups range in size from as little as 0.5 to 4 acres, and clumps comprise just 0.1 to 0.5 acres. *See* EA at 158 ("Clump and group sizes vary, but in general groups range from about one-quarter to four acres, and clumps are trees with interlocking crowns within groups"); KNF I&I at 2 ("For ponderosa pine, treatment will be to maintain and enhance within-stand diversity on a group basis (½ to 4 acres)"); Long and Smith (2000:27 – Table 2) (clump is 0.1 to 0.5 acres, and group contains "nonuniform distribution of clumps" and ranges in size from 2 to 4 acres); *Id*. at 28 (clumps may be as small as two closely spaced trees interspersed between openings, and "within-clump spacing" may be used to achieve goshawk habitat structure objective of interlocking canopies).

The North Kaibab Ranger District relies on the KNF I&I for design and implementation of the Jacob Ryan Project. EA at 121, 140-143, 158. The KNF I&I significantly changes how the Forest Service manages goshawk habitat compared to prior practices under the KNF Plan, with potentially significant implications for vegetation treatment intensities and retention of forest structure:

> As much as we can, we are adapting current prescriptions to take into account interspaces between groups and we have adjusted these prescriptions to consider group size and how we look at groups … The original analysis and documentation generally looked at how we interpreted the goshawk guidelines in the forest plan in a different manner as are currently looking at them. … This will lead to a much more open forest over time than previous interpretations of the goshawk recommendations in the forest plans would have.

Herron (2006). Clearly, professional opinion within the Forest Service is that the KNF I&I emphasis on managing goshawk habitat structure within clumps and groups, instead of in stands as before the KNF I&I, leads to significantly different outcomes on the ground than what the KNF Plan and its supporting NEPA analyses anticipated. This opinion agrees with Youtz (2006:8), who states regarding the scale of application of goshawk guidelines:

> The Goshawk guidelines use uneven-aged silviculture practices to achieve uneven-aged forest management objectives. Therefore achievement of regulated structural targets must occur at the stand-scale. In theory, once adjacent stands are moved to the target structure, the only differentiation between stands will be site characteristics such as productivity, habitat types, etc…

Despite the significant changes to goshawk habitat management proposed in the KNF I&I, the Forest Service did not allow any public input, notice, or participation regarding the new "guidelines" during their development or prior to their implementation. The Forest Service also did not prepare an EA or EIS regarding the updated goshawk guidelines, and also failed to amend the KNF Plan to properly adopt the new guidelines before implementing them in the Jacob Ryan Project.

NFMA requires the Forest Service to prepare Forest Plans for each national forest, such as the KNF. 16 U.S.C. § 1604(a). NFMA requires "one integrated plan" for each national forest, incorporating in one document or one set of documents, available to the public, all the features

required by NFMA. *Id*. at § 1604(f)(1). After a Forest Plan is adopted, the Forest Service may only amend it pursuant to specific public notice participation requirements. *Id*. at § 1604(f)(4).

The Jacob Ryan project clearly implements the KNF I&I, including how it measures canopy cover and vegetation classes. Jacob Ryan EA at 121, 140-143, 158. The Forest Service, however, has not amended the KNF Plan to incorporate the new guidelines. The agency therefore violates NFMA by either (1) implementing a *de facto* amendment of the northern goshawk standards and guidelines for the KNF Plan out of compliance with NFMA procedures for Forest Plan amendments, or (2) failing to properly amend the KNF Plan before implementing the KNF I&I guidelines, without public notice, and in violation of NFMA. *See Oregon Natural Resources Council v. Forsgren*, 252 F.Supp.2d 1088, 1096-97 (D. Or. 2003).

Whether the issue is framed in terms of a failure to act to properly amend the KNF Plan before implementing the KNF I&I guidelines, or improperly making a *de facto* amendment to the KNF Plan without complying with NFMA's public participation requirements, the Center seeks the same relief: the Forest Service must withdraw the Jacob Ryan project, at least in older VSS classes where the KNF Plan applies binding standards and guidelines to goshawk habitat, until it complies with NFMA regarding these significant changes. *Oregon Natural Resources Council*, 252 F.Supp.2d at 1099.

As with the Revised Lynx Conservation Strategy and mapping direction at issue in *Oregon Natural Resources Council*, the new goshawk guidelines "are substantial additions to the Forest Plan with regard to [goshawk] conservation efforts." *Id*. at 1101. "Whether based on a theory of a *de facto* amendment or a failure to act to amend … the public involvement required by NFMA is warranted as to [this] timber sale." *Id*. The Forest Service must not implement any portions of the KNF I&I as part of the Jacob Ryan Project unless the agency first formally amends the KNF Plan to properly incorporate the new guidelines. *Id*.

II. The Forest Service Violated NEPA by Developing and Implementing the New Goshawk Guidelines Without Preparing an EA or EIS.

NEPA requires federal agencies to prepare an EIS for any major federal action which may significant impact the quality of the environment. 42 U.S.C. § 4332(2)(C). The Forest Service may first prepare an EA to determine whether an EIS is required. 40 C.F.R. § 1501.4. The KNF I&I makes significant changes to the standards and guidelines for managing and protecting northern goshawks in the Kaibab Forest, but the Forest Service failed to prepare either an EA or EIS for the updated guidelines, in violation of NEPA.

The significance of changes made by the KNF I&I is summarized by Herron (2006), who observes that the new guidelines "will lead to a much more open forest over time than previous interpretations of the goshawk recommendations in the forest plans would have." Indeed, the KNF I&I is substantively little different from the February 23, 2007 *Implementation Guide, Region 3, Northern Goshawk Standards and Guidelines* (USDA 2007b), which sought to significantly change how northern goshawks and goshawk habitat are managed throughout Region 3 in much the same way (scale shift) as the KNF I&I does for the Kaibab Forest.

Commenting on the first Forest Service proposed action incorporating the regional Implementation Guide (Jack Smith/Schultz), the Arizona Department of Game and Fish noted:

> All previous FS-GFFP planning projects have planned canopy cover reduction levels at the stand level. In this PA, the FS is proposing target canopy cover ranges at the group level as opposed to the stand level . . . The Department finds that this change has the potential to significantly reduce the amount of forest cover within treated areas. . . Under this proposal, overall canopy cover in this management zone could be reduced to as little as 10% canopy cover if measured across the stand . . . By changing the canopy cover targets from the stand level to the group level, the Department is concerned that the FS may not be meeting the habitat requirements for [14 of the goshawk's prey species], and also may not be meeting the habitat requirements for the northern goshawk per the 1996 Forest Plan Amendment.

Jack Smith/Schultz Fuels Reduction and Forest Health Project EA at 221-222; *see also Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998) (an EIS is required if there are "substantial questions" as to whether an action may result in a significant effect on the environment, and that a plaintiff needs not show that significant effects will in fact occur).

The Forest Service admits, however, that the Jacob Ryan Project will harm northern goshawks. Under the proposed action, some degree of harm to goshawks in the project area is assured through habitat disturbance and reduced forage opportunities.

> Disturbance during prescribed burning activities might result in short-term (immediate) direct effects to individuals. Short-term (< 5yrs) indirect effects to this species are habitat disturbance and possible changes in prey species composition and populations. Possible adverse long-term indirect effects may result from the removal mistletoe-infected tress. These trees provide many goshawk prey species with important structure for nesting, resting, and feeding. Adverse effects from mistletoe sanitation are expected to be limited to specific prey species such as tree squirrels.

BE at 16. Additionally,

> Potential cumulative effects resulting from implementing alternative 2 and other vegetation management projects in ponderosa pine habitat could be both temporarily detrimental such as causing an overall reduction in prey habitat from mistletoe sanitation treatments that reduce foraging opportunities for goshawks; or beneficial such as improving the overall tree health and forest vigor.

Id.

By significantly changing the way the Forest Service measures canopy cover and vegetation classes, the KNF I&I may lead to a significant increase in the harvest of trees in suitable goshawk habitat throughout the Kaibab Forest, including in the Jacob Ryan Project. This may cause significant environmental impacts to numerous sensitive, management indicator, and other wildlife species, including northern goshawk and its prey, as well as result in adverse impacts to recreation and other resource uses. Therefore, the KNF I&I is a major federal action that may significantly impact the quality of the environment, thereby requiring an EIS, per 42

U.S.C. § 4332(2)(C), or at least the preparation of an EA to determine whether an EIS is required, per 40 C.F.R. § 1501.4. *See Oregon Natural Resources Council*, 252 F.Supp.2d at 1105 (Forest Service revision of regional mapping direction for lynx required the agency to prepare at least an EA under NEPA). Because the Jacob Ryan Project relies on and implements the KNF I&I, the project must be withdrawn until the Forest Service complies with NEPA for the new guidelines.

III. The Jacob Ryan Project Violates NFMA Because the Forest Service Fails to Demonstrate Compliance with KNF Plan Standards and Guidelines for Northern Goshawk.

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 Plans in the Southwest Region, including the KNF Plan, to provide additional standards and guidelines for northern goshawk. The Forest Service has failed to demonstrate that the Jacob Ryan Project will comply with the KNF Plan's mandatory standards and guidelines for the northern goshawk.

Appendix C to the Record of Decision for the northern goshawk plan amendments (USDA 1996) sets forth mandatory standards and guidelines for ecosystem management within goshawk habitat, and these standards and guidelines have been incorporated into the KNF Plan. *See* KNF Plan at 27 to 34. The standards and guidelines apply to all forested lands that are outside protected areas and restricted areas for the Mexican spotted owl. *Id*. at 27. The KNF Plan standards and guidelines for northern goshawk 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 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. Six identified nest sites each should 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 PFA 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 management area level, (b) the mid-scale such as drainage, and (c) the small scale of site.

(10) For areas outside of PFA, 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 – 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 PFA, canopy cover for ponderosa pine forest is to average >40% for VSS4, 5, and 6.

(13) Within PFA, 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.

KNF Plan at 27 to 31.

The Jacob Ryan EA fails to demonstrate that the project will comply with the 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). Indeed, information provided to the public demonstrates that the Jacob Ryan Project will not comply with the northern goshawk standards and guidelines in the KNF Plan.

A. Canopy cover

The North Kaibab Ranger District relies on the KNF I&I for design and implementation of the Jacob Ryan Project. EA at 121, 140-143, 158. The Forest Service does not describe the size of clumps and groups in the project area, and as a result, it is not possible for the public to determine from information given in the EA whether the proposed action will maintain the older VSS classes and canopy cover required by the KNF Plan. *See Id*. at 158 (Arizona Dept. of Game and Fish comments, "Targeting for 40-70% canopy cover in clumps/groups, with no indication of how large or small the clumps/groups are, makes it difficult to envision forest cover overall").

A serious question is raised regarding KNF Plan compliance by the Forest Service's admission that "Since the Jacob-Ryan project targets 60 percent of the acres in VSS 4 through VSS 6, we believe goshawk habitat requirements for canopy cover would eventually be met with improved tree growth following vegetation treatments." *Id*. at 121. The statement implies that: (1) most of the older VSS groups in the project area will be logged to some degree; (2) the extent, intensity, and effects of vegetation treatments on goshawk habitat structure in older forests are unknown to the Forest Service; and (3) the agency believes, but cannot prove, that required canopy cover standards applicable to VSS 4/5/6 stands will be met over time, but not immediately after proposed thinning activities.

Evidence in the project record suggests that the Jacob Ryan Project will not meet KNF Plan standards and guidelines for canopy cover in older VSS classes. First, even-aged stands created by past "shelterwood" logging, which comprise approximately 25 percent of the project area (EA at 30), are severely deficient in canopy cover now. Figure 7 (below – see Vegetation

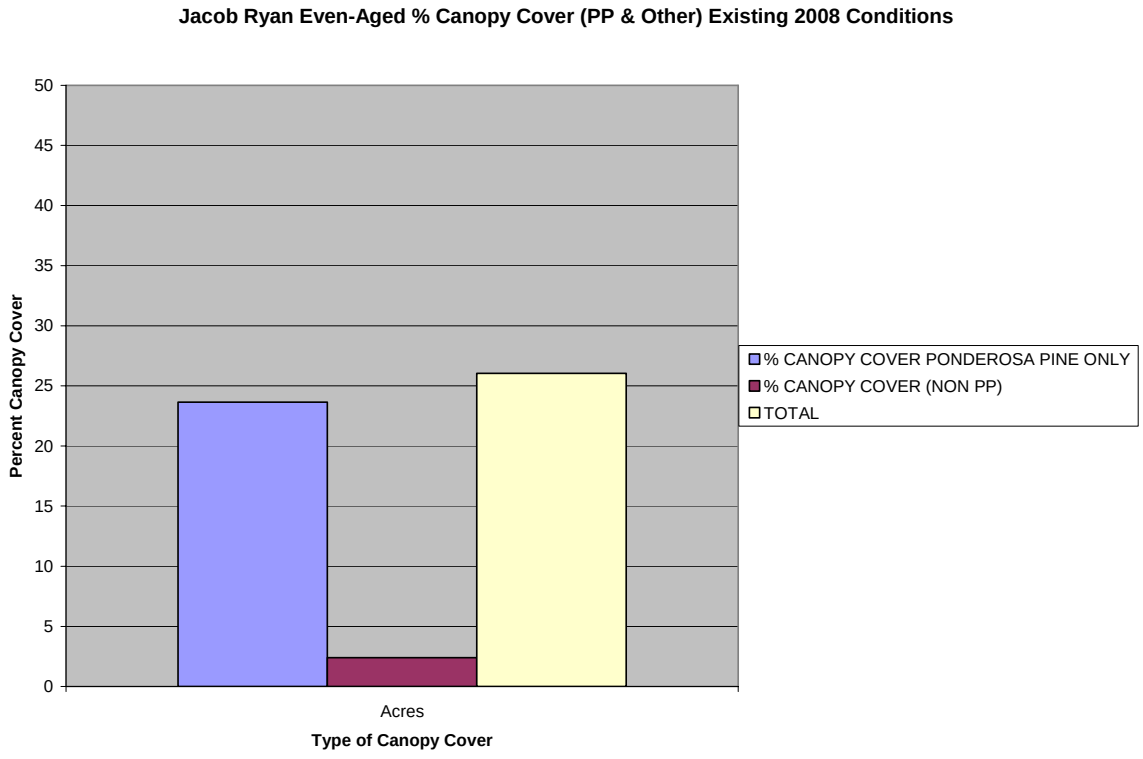

Figure 7. Existing condition of canopy cover in the even-aged stands in Jacob-Ryan.

Report ("VR") at 14) shows that canopy cover in even-aged ponderosa pine stands averages less than 25 percent now. Indeed, the Forest Service admits that it cannot meet KNF Plan standards for canopy cover in older VSS classes in even-aged stands:

Table 14. Plot by Plot summary table for the uneven-aged stands in Jacob-Ryan. (Plot data from Stand Exams analyzed by M. Pitts, RO, and S. Boyer, NKRD).

VSS	Canopy Cover	Trees Per Acre	Basal Area	Existing Acres by VSS	Existing % by VSS	Desired Acres by VSS	Desired % by VSS
1	2	314	4	609	4	1523	10
2	25	2834	47	609	4	1523	10
3	39	945	91	2895	19	3047	20
4	32	725	93	2895	19	3047	20
5	29	709	97	4418	29	3047	20
6	28	941	102	3809	25	3047	20

VR at 20. Figure 20 (below – VR at 29) corroborates Table 14 (above), and the Vegetation Report further states, "Given greater density in the nest areas, the overall coverage in ponderosa pine is approximately 37% over the entire uneven-aged area ..." VR at 29. Nest areas contain only VSS 5 and 6 classes with canopy cover ranging from 50-70%. *See* KNF Plan at 30. It is unclear from the record to what degree VSS 4 classes contribute (or not) to overall canopy cover in the uneven-aged ponderosa pine strata. The EA contains no analysis correlating existing or desired SDI values in any strata with canopy cover (per the KNF I&I Appendix B), let alone what the proposed action would do. The EA never quantifies existing canopy cover or effects of the proposed action. However, Table S2 (below) evidences that uneven-aged stands in the project area average 23% canopy cover now. *See* EA at 114. Synthesizing the available data, it appears (though the Forest Service does not disclose) that canopy cover in uneven-aged VSS 4 is incredibly low. Therefore, any removal of trees with crown characteristics that contribute to canopy cover in VSS 4 classes probably violates the KNF Plan and NFMA.

In addition to harming goshawk, as discussed above (*also see* Ward et al. (1992)), canopy reductions caused by logging in VSS 4 groups in all strata will harm other sensitive wildlife, including Kaibab squirrel. "Crown connectivity could be reduced during the creation of openings between the groups and clumps … Indirectly, truffle production may be reduced due to a decrease in canopy closure following stand treatments." EA at 69.

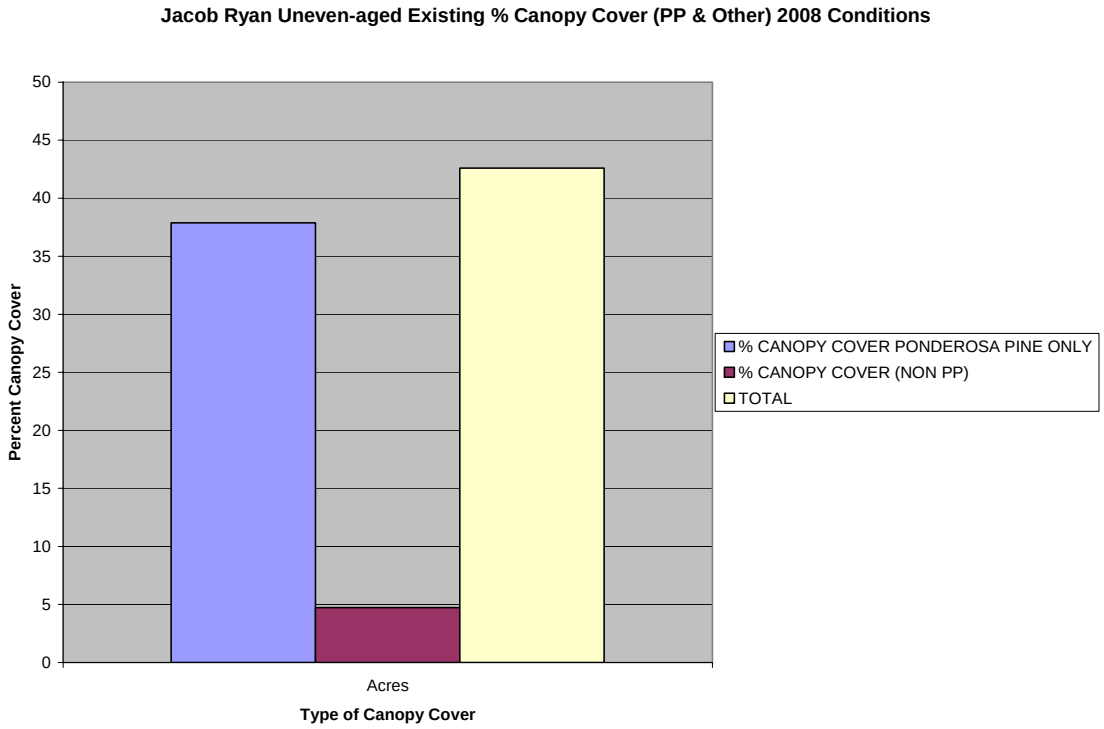

Figure 20. Canopy cover for uneven-aged strata in 2008 showing existing conditions.

B. Vegetation structure

The Forest Service admits that "Both the project area (19%) and the ad hoc area (15.7%) appear to have deficits in mid-age forest (VSS4) structure." *Id*. at 112. It attributes the deficit to an averaging of goshawk habitat structure values "across many thousands of acres," and suggests that "sites with surpluses may have a continuous canopy make up not only requiring a reduction in tree numbers, but the creation of groups and suitable openings for better growth." *Id*. Indeed, the Jacob Ryan DN approves logging trees (or does not forbid it) in the VSS 4 size class (12.1" to 17.9" dbh) in every stratum in the project area, including in even-aged stands where such trees are exceedingly rare. *See* DN at 6-7; EA at 30 and 65.

The agency's admission that the VSS 4 class is deficient at multiple scales contradicts its reasons for rejecting Alternative 3:

> The desired uneven-aged stand structures could not be achieved under [Alternative 3] because the amount of area in VSS 4 (12"-18" trees) would remain above the desired 20 percent. The current amount of VSS 4, 5, and 6 is 73 percent compared to the desired 60 percent. With no means of reducing the number of trees in the 12-to-17.9-inch size-class, there is a reduced ability to maintain groupings, create openings, and develop the desired VSS 1 and 2 size-classes. This alternative would not result in the desired condition of a mosaic of uneven-aged groups of trees across time and space on the landscape.

EA at 34-35. The Forest Service fails to reconcile its statement above that the project area "would remain above the desired 20 percent" for VSS 4 structure unless trees larger than 12" dbh are logged with data presented in Tables S42, S2, and Table 5 (below). *See* EA at 13, 112-114.

Table 5—Desired and existing distribution of vegetative structural stages for ponderosa pine forest types in the Kaibab National Forest Plan and Jacob-Ryan project area

Vegetative Structural Stage	VSS 1	VSS 2	VSS 3	VSS 4	VSS 5	VSS 6
Dominant Tree Diameter (DBH)	Less than 1"	1"-4.9"	5"-11.9"	12"-17.9"	18"-23.9"	24" over
Description	Grass/forbs and Shrubs	Seedlings Saplings	Young Forest	Mid-aged Forest	Mature Forest	Old Forest
Desired Area (%) In Each VSS	10	10	20	20	20	20
Existing Area (%) In Each VSS	4	4	19	19	29	25
Desired Trees Per Acre	61	36	26	13	10	7
Existing Trees Per Acre	190	198	65	20	13	7

EA at 13. Data in Table 5 describing VSS distribution in the project area agree with similarly scaled data shown in Table S2 (below). *See Id*. at 114. VSS 4 groups are deficient relative to KNF Plan standards at every spatial scale analyzed in the EA.

The Forest Service contradicts its own data with an unsubstantiated claim quoted above that VSS 4 is too abundant. No analysis or evidence supports the claim, and the agency does not specify at a spatial scale at which VSS 4 may exceed KNF Plan standards. Therefore, the agency made a clear error of judgment in basing its comparison of alternatives and analysis of project effects on a groundless claim that deferral of cutting trees >12" dbh would fail to meet the purpose and need for action and fail to meet KNF Plan standards for uneven-aged goshawk habitat structure. *See* EA at 34-35, 63-64, 113. In fact, conversion of VSS 4 groups "where they are surplus" (locations and acres of VSS 4 to be converted remain a mystery) to VSS 1 and 2 via group selection logging will violate KNF Plan standards and NFMA because that structural class is lacking now at all spatial scales.

C. Analysis scale

The KNF Plan requires, "Distribution of habitat structures (tree size and age classes, tree groups of different densities, snags, dead and down woody material, etc.) should be evaluated at the ecosystem management area level, at the mid-scale such as drainage, and at the small scale of site." KNF Plan at 29.

Contrary to this plain requirement, the Forest Service asserts that the KNF Plan merely "requires that the effects for vegetative structure are assessed at one scale smaller and larger than the project area." EA at 109 [emphasis added]. It invents a completely novel evaluation approach specifically for the Jacob Ryan Project: "The analysis for the JR project was conducted at the

strata level (even-aged and uneven-aged), the project level and at the larger ad hoc analysis area." *Id*.

The Forest Service errs in two ways. First, it evaluates some habitat structures, but not others, at just two spatial scales that significantly differ from the three scales identified by the KNF Plan as the appropriate basis for evaluation of goshawk habitat structure. Second, even if the agency's interpretation of the management scale requirement were valid (which it is not), the Jacob Ryan EA does not meet it because the analysis fails to evaluate effects of the proposed action on habitat structures at any scale, as the Forest Service admits is required by the plan.

i. Strata

The "strata level" at which the Forest Service bifurcates even-aged from uneven-aged stands occurs at spatial scales ranging from 8,000 to 18,000 acres. *Id*. at 114 (Table S2); *also see id*. at 8-10 and 14-15. This is the finest spatial scale at which the agency evaluates goshawk habitat structures in the Jacob Ryan EA. That scale is considerably larger than the "small scale of site" identified by the KNF Plan as the appropriate scale of evaluation, which the Forest Service defines as synonymous with "stand." *See, e.g.*, KNF I&I at 8 ("*Regulation will be attempted at the stand (site) level based on the existing condition at the assessment level ...*"); USDA 2006 at 8 (Table 4) ("*Alternative D calls for: (1) up to 20 percent of the landscape to be managed for even-aged management for sites up to 100 acres in size...*"). Indeed, KNF Plan describes "sites" as discrete locations associated with goshawk nests within relatively small areas that comprise only a few hundred acres:

> Post-fledgling family areas (PFA) will be approximately 600 acres in size. Post-fledgling family areas will include the nest sites and consist of the habitat most likely to be used by the fledglings during their early development.
>
> Establish a minimum of three nest areas and three replacement nest areas per Post-fledgling family area. The nest areas and replacement nest areas should be approximately 30 acres in size. A minimum total of 180 acres of nest areas should be identified within each post-fledgling family area.
>
> Nest site selection will be based first on using active nest sites followed by the most recently used historical nest areas. When possible, all historical nest areas should be maintained.

KNF Plan at 29. Youtz (2006:6) similarly describes "nest stands" as comprising 30 acres.

Therefore, the strata level of analysis in the Jacob Ryan EA is between 8,000 and 60,000 percent larger than the "small scale of site" identified by the KNF Plan as appropriate for habitat structure evaluation. The Forest Service makes no attempt to explain or rationalize this extreme deviation in its analysis approach from what is required by the Forest Plan.

The Forest Service may respond that it did, in fact, accomplish the required site scale evaluation by analyzing even-aged and uneven-aged strata both within and outside of PFA in addition to analyzing habitat structures within nest areas. Such a defense is not effective because

the strata analysis merely evaluates existing and projected conditions associated with the no-action alternative. *See* EA at 8-11, 14-16, 31-32; BE at 12-14. No portion of the Jacob Ryan EA discloses effects of the proposed action on habitat structures. It merely asserts without evidence that the proposed action would "make progress towards achieving the desired size-class distribution," "promote better diameter growth and future desired structure," and "open up the rooting zones and increase moisture and nutrient availability." EA at 34. The EA fails to quantify short- or long-term effects of logging on size class distributions, tree growth rates, basal area, canopy cover, snags, downed logs, or other aspects of habitat structure in any stratum.

The Forest Service asks the public to accept on faith that the Jacob Ryan Project will meet KNF Plan requirements without providing hard data and objective analysis that is necessary to independently determine and calculate whether the project will in fact be consistent with plan requirements. *See Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1150 (9th Cir. 1998) (NEPA requires the public to receive the underlying environmental data from which the Forest Service experts derive their opinions and conclusions). 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.

ii. Ad hoc

The "ad hoc analysis area" includes the Jacob Ryan Project area plus six surrounding landscape areas that together comprise approximately 78,000 acres. EA at 109-114. A footnote explains, "Ad hoc as used in this analysis area definition is set up as a special case for only this project. It is used for large scale analysis for vegetation stage structure for goshawks and at the mid-scale analysis for the status of old-growth." *Id*. at 109. The Forest Service uses this novel "ad hoc" approach to blur distinct scales identified by the KNF Plan as appropriate for goshawk habitat structure evaluation ("the ecosystem management area level" and "the mid-scale such as drainage"):

> The Forest Plan was corrected in November 2008 to make language consistent between the Forest Plan and the Regional EIS for the 1996 Plan Amendments. Ecosystem Management Areas (EMAs) were renamed to Geographic Areas, but retained their numerical designations. Geographic Areas contain within them smaller management area landscapes that average 10,000 acres to 20,000 acres (Figure S1). These landscape areas are typically used for the large scale analysis. The Forest Plan allows the ID team to determine an ad hoc area for the large scale analysis if more appropriate for the analysis needs. Because the Jacob-Ryan Project contained portions of several landscapes, the ID team determined the combined landscapes would be appropriate ad hoc area for this large scale.

Id. Thus, the Jacob Ryan EA substitutes "smaller management area landscapes that average 10,000 acres to 20,000 acres" for "the ecosystem management area level" as the setting for its "large scale analysis" of habitat structure. *See* EA at 114 (Table S2). The ad hoc analysis area totals approximately 78,000 acres (*Id*. at 109 and 114), whereas the ecosystem management area level (Geographic Area 13) comprises 268,719 acres, a difference of almost 350 percent. *See*

KNF Plan at 36; EA at 109 ("The large scale analysis area for old growth is Geographic Area 13 (formerly EMA 13) and consists of about 250,000 acres.").

The only explanation provided by the Forest Service for this significant difference in scaling of habitat structure evaluation from what the KNF Plan demands is a suggestion that the six "smaller management area landscapes" that average 10,000 to 20,000 acres are ecologically similar to the Jacob Ryan Project area:

> The ad hoc analysis area for the JR project includes six of those landscapes: Billy Sink, Buck Ridge, East Lake, Trail Canyon, Warm Oak, and Wild Horse (Figure S2). The Wild Horse and Buck Ridge landscapes contribute the majority of acreage to the ad hoc area. These landscapes were selected for the ad hoc area, because the project is within portions of each landscape and they are dominated by ponderosa pine similar to the JR project area.

EA at 109. However, that rationale for selecting smaller landscape areas adjoining the project area fails to distinguish the ad hoc analysis scale because "Ponderosa pine predominates in most of [Geographic Area 13], except at higher elevations and on cooler sites." KNF Plan at 36-37. Additionally, the Forest Service analyzes old-growth at the scale of Geographic Area 13, meaning that analysis at the "ecosystem management area" scale is not prohibitive. *See* EA at 109. This ad hoc deviation from KNF Plan guidelines for multi-scaled goshawk habitat structure evaluation at three distinct spatial levels is inexplicable, unexplained, and arbitrary.

Moreover, as with the strata-scale evaluation, the ad hoc analysis also fails to disclose effects of the proposed action on habitat structure. It only evaluates existing and desired conditions. *See* EA at 112 (Table S42) and 114 (Table S2). Those tables and summary text are located below the heading, "Direct and Indirect Effects for All Alternatives at the Ad Hoc Scale," and accompany a general narrative of assumed thinning effects in each alternative. Please note that the aggregated VSS 1/2/3 and 4/5/6 values shown for the ad hoc scale in Table S2 correspond exactly to the sum of "existing condition" values in Table S42.

The text below Table S2 states that the Jacob Ryan Project will execute "minimal reductions for VSS 4 when sites exceed the desired condition," but it does not quantify the intensity of reduction or the extent of sites in the project area where a "surplus" of VSS 4 stand structures may exist. *Id*. at 114. Table S42 (below) indicates that VSS 4 structure is currently deficit at project (19%) and ad hoc (15.7%) analysis scales.

Table S42—Current condition for VSS distribution of ponderosa pine in the ad hoc area

GROWTH STAGE	Grass/forbs and Shrubs	Seedlings Saplings	Young Forest	Mid-aged Forest	Mature Forest	Old Forest
SIZE	0 - 1"	1"-4.9"	5"-11.9"	12"-17.9"	18"-23.9"	24" over
VSS	1	2	3	4	5	6
EXISTING CONDITION (%)	5.2	4.8	21.2	*15.7	30.8	21.4
DESIRED CONDITION (%)	10	10	20	20	20	20
ESTIMATED ACRES IN 2008	3588	3312	14628	10833	15387	21252

*Both the project area (19%) and the ad hoc area (15.7%) appear to have deficits in mid-age forest (VSS4) structure. The reason for these below desired condition averages is that these percentages are averages across many thousands of acres. Some stands may have deficits in VSS4 trees while others may have a surplus. These sites with surpluses may have a continuous canopy make up not only requiring a reduction in tree numbers, but the creation of groups and suitable openings for better growth. Sites lacking in VSS4 trees would not have their numbers reduced and every effort would be made to increase this size class of trees.

Id. at 112-113. The EA also asserts in text following Table S2 (below – *see* EA at 114) that the proposed action "would improve the uneven-aged structure by 30% in the project and ad hoc areas, thereby creating more and better goshawk habitat," but no data shows what VSS classes will increase or decrease, whether the change will come from currently deficient VSS 4 structure, or at what intensity. *Id*. at 115.

Given the seemingly contradictory information given by the Jacob Ryan EA, it is not possible for the public to independently determine if the project will comply with KNF Plan standards for goshawk habitat structure at any spatial scale, including the 26,000-acre project scale and the 78,000-acre ad hoc scale, which the KNF Plan does not recognize as valid scales of evaluation, let alone at the three spatial scales identified by the plan. Even the Forest Service's new *Region 3 Implementation Guide* for goshawk guidelines (USDA 2007b) acknowledges that the guideline regarding "management scale" requires northern goshawk habitat information to be gathered and discussed at the ecosystem management area level, mid-scale (drainage or project area) and small scale (site/stand), and that the "[c]ollection of this basis data at these three scale

Table S2—Analysis scales for VSS per goshawk guidelines in Jacob-Ryan

Forest Plan standards & guidelines for desired conditions	Strata Scale - Averages ~ 8,000 ac ~ 18,000 ac				Mid-Scale Anal. Area Project Area ~ 26,000 ac	Large Scale Analysis Area ad hoc-6 landscapes ~ 78,000 ac
VSS Percent by Acres	Even-age		Uneven-age		Weighted Average All Acres	Weighted Average All Acres
VSS 1 and 2 (20%)	11.3 %		8.0 %		9.0 %	
VSS 3 (20%)	36.8 %		19.0 %		24.6 %	VSS 1 – 3 about 31.2 %
VSS 4 (20%)	14.0 %		19.0 %		17.4 %	
VSS 5 (20%)	23.9 %		29.0		27.4 %	
VSS 6 (20%)	14.0 %		25.0 %		21.6 %	VSS 4 – 6 about 68.8 %
VSS Class	Even-age (tpa)		Uneven-age(tpa)		Project Area	Ad hoc Area
Trees per Acre (tpa)	PFA	Non-PFA	PFA	Non-PFA	Trees per Acre	Trees per Acre
VSS 1 (61)	40	57	190	136	190	About 853 trees per acre
VSS 2 (41)	239	192	182	213	198	Data not broken out by
VSS 3 (31)	38	35	70	59	65	species, only total trees/acre
VSS 4 (16)	9	11	20	22	20	
VSS 5 (11)	4	5	13	14	13	Includes all tree species
VSS 6 (7)	2	2	6	7	7	
Canopy Cover Percent	Even-age		Uneven-age		Project Area	Ad hoc Area
VSS 4/5/6, 40% to 70%	PFA	Non-PFA	PFA	Non-PFA		
	~10.0%	~11.0%	~23.%	~23.0%	~20.0%	~ 31.0%
Snags = 2 per acre	Even-age		Uneven-age		Project Area	Ad hoc Area
18" DBH & 30'tall	<1 snag / acre		1.1 snag / acre		~ 1 snag / acre	~ 2 snags / acre, includes 10K
						acres in Warm Fire use area
Logs = 3 per acre	Even-age		Uneven-age		Project Area	Ad hoc Area
>12" DBH & 8' long	~ 3 logs / acre		~ 3 logs / acre		~ 3 logs / acre	~ 3 plus logs / acre, see below
Down Woody Material	Even-age		Uneven-age		Project Area	Ad hoc Area
3" or greater on forest floor	~3-7 tons / acre		~ 10-15 tons / acre		~ 14 tons / acre	~ 9 – 10 tons / acre, will increase when snags in Warm Fire fall

Nest areas and dwarf-mistletoe acreages and percentages added into PFA and Non-PFA totals.
Primary treatment emphasis is for thinning in VSS 2 and VSS 3. No reductions in VSS 5/6 and only minimal reductions for VSS 4 when sites exceed the desired condition.

levels is essential" (USDA 2007b:2). The Jacob Ryan EA, however, capriciously fails to gather, analyze and discuss goshawk information at these three different levels. Therefore, the Forest Service has not ensured that the project will comply with NFMA.

D. Nest habitat

The Jacob Ryan Project will not meet KNF Plan standards for vegetation structure in goshawk nest areas on 3,205 acres. According to the plan, "The structure of the vegetation within nest areas is associated with the forest type, and tree age, size, and density, and the developmental history of the stand. Table 5 of RM-217 presents attributes required for goshawks on locations with 'low' and 'high' site productivity." KNF Plan at 30. The referenced Table 5 (below) is from Reynolds et al. (1992:14), and it specifies a Site Index threshold value of 55 triggering one of two sets of "required" attributes in goshawk nest stands.

Table 5. Structural attributes for suitable northern goshawk nest stands in the Southwest[1].

Forest Cover Type[2]	Piñon-Juniper	Interior Ponderosa Pine		Mixed-Species		Aspen	Engelmann Spruce-Subalpine Fir
Site Index[3]		<55	≥55	<50	≥50		
Trees/Acre[4]	60-100	40	30	45	35	20	35
Mean DBH/DRC (in.)[5]	12	16	22	15	20	16	20
Age (yrs.)[5]	200+	200+	200+	200+	200+	80+	150+
Total BA (sq. ft/acre)[6]	60	120	140	110	130	50	140
Overstory canopy cover (%)	60+	50+	60+	50+	60+	60+	70+
VSS[7]	5A-6	5B-6	5B-6	5B-6	5B-6	5B-6	5B-6

[1] *The entire nest area may not support all of these structural attributes.*

[2] *Forest cover types, SAF codes (Eyre 1980); Ponderosa pine 237; Mixed-species 209, 210, 211, 216; Aspen 217; Engelmann spruce-Subalpine fir 206; Piñon-juniper 239.*

[3] *Site Index (SI) = base age of 100 years; SI used for interior ponderosa pine = ponderosa pine; SI used for mixed-species = Douglas-fir.*

[4] *Number of live trees in the main canopy.*

[5] *Arithmetic average of the ages of dominant and codominate trees in the stand; DBH = diameter at breast height; DRC = diameter at root crown.*

[6] *BA = basal area.*

[7] *VSS = Vegetation Structural Stage.*

The Forest Service indicates in response to comments that uneven-aged ponderosa pine forests in the Jacob Ryan Project area fall above the threshold value (68.26) indicated in Table 5 above. *See* EA at 163. Thus, the KNF Plan requires the agency to maintain 30 trees per acre with a mean diameter at breast height of 22 inches and basal area of 140 ft²/acre that could be characterized as a VSS 5B with canopy cover >60% on at least 180 acres per goshawk PFA in the project area. *See* KNF Plan at 29-30.

The Jacob Ryan EA does not demonstrate that the Forest Service will comply with the mandatory requirements of the KNF Plan for goshawk nest area structure. First, its description of desired conditions for nest areas is inconsistent with the Forest Plan standards and guidelines. Table 12 (below) indicates that the Forest Service would maintain just 19 trees per acre in VSS 5 and 6 classes. *See* EA at 16. Although the size class distribution represented by VSS 5 and 6 does not exactly correspond to the minimum mean diameter of 22 inches specified by RM-217, the EA does not designate a sufficient number of larger-end VSS 4 trees to make up the difference.

Additionally, the EA fails to specify a target condition for basal area and canopy cover in nest stands, even though the KNF I&I (Appendix B) outlines a procedure to correlate canopy cover with stand density.

Table 12—Existing vs. desired condition in northern goshawk nesting areas (3,205 acres)

Tree-age by range of diameters	Vegetation Structural Stage (VSS)	Existing number of trees per acre	Desired number of trees per acre	Difference between existing and desired trees per acre
Less than 1"	VSS 1	305	61	+ 244
1"–4.9"	VSS 2	209	41	+ 168
5"–11.9"	VSS 3	64	31	+ 33
12"–17.9"	VSS 4	16	16	0
18"–23.9"	VSS 5	12	11	+1
24" and over	VSS 6	7	8	-1

EA at 16.

Second, the Jacob Ryan EA fails to describe effects of the proposed action on nest habitat structure. The Forest Service never bothered to improve its analysis from the draft EA, on which we commented:

> The EA never quantifies Proposed Action effects on nest stand attributes other than to assert that, "FVS modeling was done for the proposed action on different representative stands. Modeling of an uneven-aged replacement goshawk nest stand showed that the projected average diameter would double over the next 40 years." Id. at 34. That is the only specific mention of effects to nest stand structure. The EA states elsewhere, "Under the proposed action, all known goshawk nest sites have specific treatments designed to enhance existing nesting habitat while protecting the integrity of the vertical diversity. Treatment activities would be seasonally restricted to prevent disturbance at active nests." Id. at 63. The balance of the analysis generalizes results for all forest stands in the project area. Id. at 34-36 and 63-64. As a result, all the public gets to see is an assertion that modeling projects average diameter to double in one replacement nest stand four decades after proposed treatments. There is no showing that the Proposed Action will maintain the "required" nest stand attributes, nor any showing of model results for the single "replacement" nest stand of indeterminate size that was analyzed out of 4,200 acres of potential nesting habitat.

Appellants' EA comments at 8 [emphasis added]. It is obvious from Table 19 (below – *see* EA at 32) that current conditions aggregated across all goshawk nest stands in the Jacob Ryan Project

Table 19—Current and projected future tree density stand statistics in nest areas

Year	Trees/Acre	Basal Area	Average DBH	SDI
2008	609 (180)	127 (100.0)	6.0 (18.0)	295 (190)
2028	540	151	6.8	331
2048	460	166	7.8	348

area do not meet KNF Plan standards for lack of large trees: density is high, and basal area and average diameter values are low. However, to justify thinning of trees up to 18" dbh in replacement nest areas (DN at 7), the Forest Service needs to demonstrate a plan to achieve KNF Plan standards for those stands, including how it will prevent loss of old tree recruitment potential and ensure maintenance of required canopy cover distributions.

The failure of the Jacob Ryan EA 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).

IV. The Forest Service Violated NEPA By Failing to Prepare an EIS for the Jacob Ryan Project.

"NEPA imposes a procedural requirement that a federal agency must contemplate the environmental impacts of its actions." *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1149 (9th Cir. 1998). NEPA requires 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 decisionmaking process and implementation of that decision." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

Congress directed NEPA to apply "to the fullest extent possible," which means as liberal an interpretation as possible to accommodate the application of NEPA. *Jones v. Gordon*, 792 F.2d 821, 826 (9th Cir. 1986); 42 U.S.C. § 4332. A plaintiff does not need to demonstrate that a proposed action will in fact have a significant impact on the environment. *Idaho Sporting Congress*, 137 F.3d at 1150. Instead, the standard is whether substantial questions have been raised as to whether the proposed action may cause a significant effect on some environmental factor. *Id*. at 1149-50. If substantial questions are raised whether the proposed action may have a significant effect upon the environment, an EIS must be prepared. *Id*.

If an agency decides not to prepare an EIS, it must supply a "convincing statement of reasons" to explain why the project's impacts will be insignificant. *Blue Mountains Biodiversity Project*, 161 F.3d at 1212. "The statement of reasons is critical to determining whether the agency took a 'hard look' at the potential environmental impact of a project." *Id*.

In considering whether an EIS is required for a proposed action, the CEQ regulations direct agencies to consider ten "significance factors." 40 C.F.R. § 1508.27(b); *Blue Mountains Biodiversity Project*, 161 F.2d at 1212. "[Any] of these factors may be sufficient to require preparation of an EIS in appropriate circumstances." *National Parks and Conservation Assoc. v. Babbitt*, 241 F.3d 722, 731 (9th Cir. 2001). The NEPA significance factors demonstrate that the Forest Service must prepare an EIS to analyze the environmental impacts of the Jacob Ryan Project.

A. The Environmental Effects of the Jacob Ryan Project Are Highly Controversial

"Agencies must prepare environmental impacts statements whenever a federal action is 'controversial.'" *National Parks and Conservation Assoc.*, 241 F.3d at 736; 40 C.F.R. § 1508.27(4). "Controversial" refers to "a substantial dispute about the size, nature, or effect of the major Federal action rather than the existence of opposition to a use. *Blue Mountains Biodiversity Project*, 161 F.3d at 1212. Contrary to the District Ranger's assertion in the FONSI (DR at 10-11), Jacob Ryan is "controversial" for two reasons.

i. Goshawk guidelines

First, the potential environmental effects of the significant revision of the standards and guidelines for the northern goshawk are highly controversial. While the Forest Service claims it is merely "clarifying" past standards and guidelines, Appellants, the Arizona Department of Game and Fish, and Forest Service specialists recognize that the New Goshawk Guidelines will result in significant impacts to goshawks and other species by allowing substantially more logging within goshawk habitat than was anticipated by the 1996 ROD and its supporting analysis as well as subsequent supplements. *See* Herron (2006) ("The original analysis and documentation generally looked at how we interpreted the goshawk guidelines in the forest plan in a different manner as are currently looking at them. … This will lead to a much more open forest over time than previous interpretations of the goshawk recommendations in the forest plans would have"); *also see* Jack Smith EA at 222 (Arizona Dept. of Game and Fish comments stating that "By changing the canopy cover targets from the stand level to the group level, the Department is concerned that the FS may not be meeting the habitat requirements for [14 of the goshawk's prey species], and also may not be meeting the habitat requirements for the northern goshawk per the 1996 Forest Plan Amendment").

The substantial difference of opinion regarding the potential impacts of the implementation of the KNF I&I guidelines, as demonstrated between the Forest Service and Arizona Department of Fish and Game, "is precisely the type of 'controversial' action for which an EIS must be prepared." *Blue Mountains Biodiversity Project*, 161 F.3d at 1212.

ii. Large trees

Second, the environmental effects of removing larger trees, especially those >16" dbh, are controversial because it has potential to further degrade ponderosa pine forests already stripped of large tree structure at regional, landscape, and smaller spatial scales (Allen et al. 2002, Cortner 2003, Covington and Moore 1997, Drum et al. *in review*, Frederici 2003).

Significant portions of the Jacob Ryan Project area currently lack large tree structure (EA at 30, 65), yet the Decision Notice authorizes logging trees up to 18" dbh in goshawk nest stands (3,205 acres), in even-aged stands outside PFA (3,170 acres), in dwarf mistletoe areas (994 acres), and in uneven-aged stands outside PFA (8,026 acres) (DN at 6-7). In even-aged strata, trees larger than >12" dbh are severely deficient due to past "shelterwood" logging. EA at 14-15 (Tables 8 and 9). There is absolutely no ecological need to cut trees larger than 12" dbh in even-

aged stands, and the 12" upper diameter limit in Alternative 3 would achieve the purpose and need for action just as well as the proposed action in those strata. *See* EA at 30 and 34.

Cutting trees up to 18" dbh in goshawk nest stands is particularly controversial because those areas require greater basal area and canopy cover than other uneven-aged strata. Table 19 (above) shows that nest stands are deficient in large tree structure and suffer excessive densities of trees smaller than 12" dbh. *See* EA at 32. Again, a 12" upper diameter limit, per Alternative 3, would meet the purpose and need and avoid violating KNF Plan standards and guidelines, as the proposed action will.

In uneven-aged strata, appellants commented that a 16" upper diameter limit on tree cutting would meet the purpose and need as well as avoid irreversible losses of large tree recruitment structure. Trees larger than 16" dbh comprise approximately three percent (3%) of live ponderosa pines in Arizona and New Mexico, according to Forest Inventory and Analysis (FIA) data (USDA 1999, USDA 2007a). The same data indicate that more than eighty-two percent (82%) of ponderosa pine trees in the southwest region are smaller than 11" dbh; approximately ninety-six percent (96%) of ponderosa pines are smaller than 15" dbh; and less than one-tenth of one percent (.01%) are larger than 21" dbh (Table 1 below). The size distribution of trees in Region 3 is heavily skewed toward small-diameter stems (Figure 1 below), and it is dramatically different from historical conditions (Fulé et al. 1997). Given the rarity of large-diameter trees and the overabundance of small trees, removal of trees larger than 16" dbh cannot be justified on ecological grounds (Allen et al. 2002). Trees >16" dbh represent the best recruitment potential for mature and old forests that are currently deficient (Arno 2000, Noss et al. 2006).

Table 1. Tree size class distribution in southwestern ponderosa pine forests.

Size class	Distribution
< 11 inches dbh	82%
< 15 inches dbh	96%
> 16 inches dbh	3%
> 21 inches dbh	0.1%

Source: Forest Inventory and Analysis National Program
Forest Inventory Data Online (FIDO). http://www.fia.fs.fed.us/tools-data/

An upper diameter limit of 16" hedges against unintentional loss of large tree structure from activities other than logging in the Jacob Ryan Project. A variety of factors other than logging threaten the remaining large trees in southwestern ponderosa forests. Prescribed fire treatments can damage tree roots and cause high levels of mortality among large trees (Sackett et al. 1996). Burning of pine stands with high surface fuel loading also can result in extensive tree

mortality (Hunter et al. 2007), and fire treatments may leave trees susceptible to delayed bark beetle infestation (Wallin et al. 2003). Additionally, large tree mortality has directly resulted from mechanical thinning activities (Hunter et al. 2007). Large snags and downed logs, which provide critical habitat for cavity-nesting birds, bats, small mammals, reptiles, amphibians and insects, are often destroyed by fuel reduction treatments (Hunter et al. 2007). Such coarse woody material is currently severely deficient in the project area. *See* EA at 114 (Table S2).

Any gains in new snags and downed logs as a result of vegetation treatments do not offset their loss at a landscape scale (Randall-Parker and Miller 2002). The continued existence of large trees and snags for purposes of old-growth habitat function and ecosystem resilience to fire disturbance is by no means assured. Considering their scarcity, as well as the unique services they provide, large trees should be preserved whenever possible as a precaution in the manipulation of forest structure.

An upper diameter limit of 16" dbh on trees to be cut and removed is necessary to preserve rare large tree structure, critical wildlife habitat, forest health, and general aesthetics. Unless it is shown to be absolutely necessary to attain the purpose and need for action, which the Jacob Ryan EA does not accomplish, no trees larger than 16" dbh should be harvested — this limit is simple to observe and widely accepted (Friederici 2003).

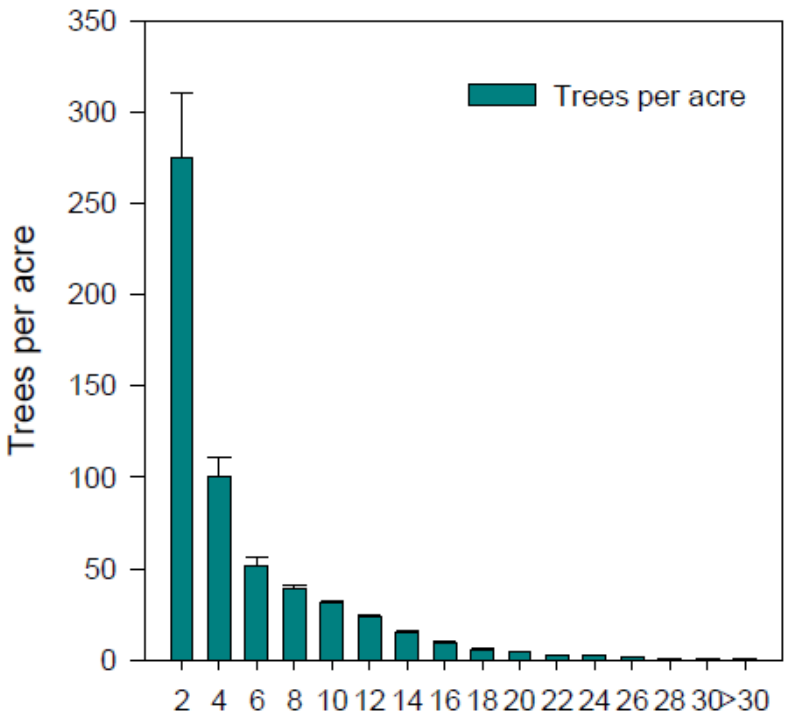

Figure 1. Tree size class distribution in southwestern ponderosa pine forests. Source: USDA (1999, 2007a).

Large trees are the most difficult of all forest structural elements to replace (Agee and Skinner 2005), and logging them constitutes an irreversible environmental impact that is scientifically controversial in regards to its efficacy in fire hazard reduction and forest restoration (Arno 2000, Cortner 2003). Therefore, any decision to cut and remove large trees will necessitate preparation of an environmental impact statement (EIS). 40 C.F.R. § 1508.27. An EIS would have to respond to controversy and offer a reasoned response to it. The statement also must analyze indirect and cumulative effects of large tree removal on stand and landscape scale fire regimes, as well as on local and total populations of sensitive wildlife.

Moreover, Forest Service data do not support the agency's stated reasons for resisting a 16" diameter limit on tree cutting in uneven-aged strata of the Jacob Ryan Project. It states regarding Alternative 3 (12" limit),

> The desired uneven-aged stand structures could not be achieved under this alternative because the amount of area in VSS 4 (12" −18" trees) would remain above the desired 20 percent. The current amount of VSS 4, 5, and 6 is 73 percent compared to the desired 60 percent. With no means for reducing the number of trees in the 12-to 17.9-inch size-class, there is a reduced ability to maintain groupings, create openings, and develop the desired VSS 1 and 2 size-classes. This alternative would not result in the desired condition of a mosaic of uneven-aged groups of trees across time and space on the landscape.

We explain above why this statement is groundless and unsupported by VSS distribution data, which actually shows a deficit of stands dominated by 12.1" – 17.9" dbh trees. Further, the contention that marginally higher residual tree densities would cause significantly more competition-induced mortality and vulnerability to disturbance is contradicted by the data. Figure 11 (below) evidences very little difference, likely within an unquantified margin of error, of current and desired tree density in the VSS 4 size class of uneven-aged strata in the project area.

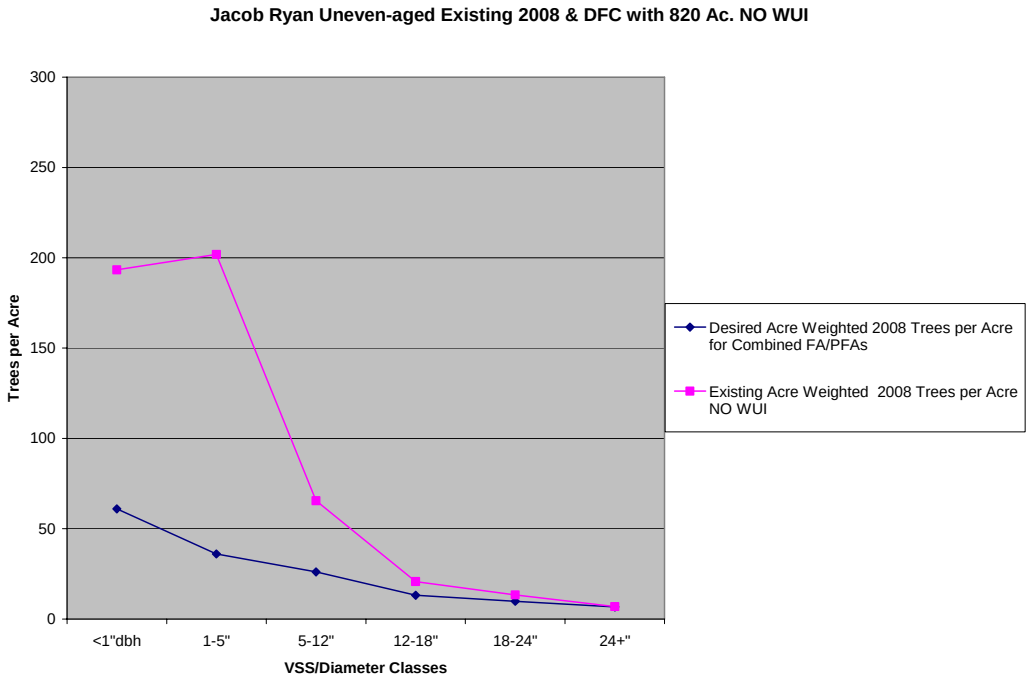

Figure 11. Trees per acre by VSS class for No Action, existing and desired condition, in 2008.

VR at 21. It is clear from Forest Service data that excessive tree densities diminish near 10" dbh and level off at 16" dbh under current conditions. Additionally, Figure 12 shows that limiting logging to trees <16" dbh will have no impact on uneven-aged stand density 45 years from now.

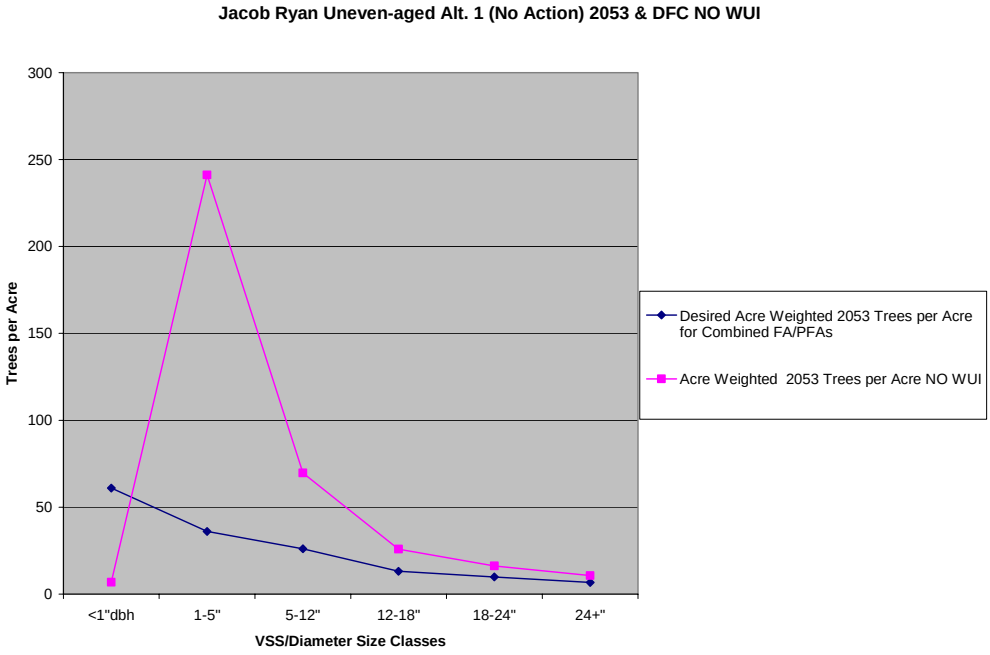

Figure 12. Trees per acre by VSS class for No Action, existing and desired condition, in 2053.

VR at 22. In the modeled projection of the no-action alternative, tree densities spike above current conditions in the VSS 2 class and remain elevated in VSS 3, but remain almost the same, again within the undefined margin of error, in VSS 4 and larger size classes.

B. The Effects Are Highly Uncertain and Involve Unknown Risks

"A project may have significant environmental impacts where its effects are 'highly uncertain or involve unique or unknown risks.'" *Blue Mountains Biodiversity Project*, 161 F.3d at 1213, *quoting* 40 C.F.R. § 1508.27(b)(5). The Jacob Ryan Project relies on the KNF I&I goshawk guidelines, which constitute a significant revision of the KNF Plan standards and guidelines for northern goshawk habitat. While the drastic changes made by the new guidelines is anticipated to be significant, *see* Herron (2006), the overall impacts on the northern goshawk and other species is highly uncertain and unknown. See also EA at 158 (Arizona Dept. Game and Fish comments on Jacob Ryan EA, "Targeting for 40-70% canopy cover in clumps/groups, with no indication of how large or small the clumps/groups are, makes it difficult to envision forest cover overall").

The Forest Service's claim that the Jacob Ryan Project will result in trees growing into larger diameter classes at a faster rate, as compared to taking no action in the project area, is also highly uncertain. As in *Ecology Center v. Austin*, the Forest Service fails to provide scientific support for its theory, and fails to disclose the uncertainty and risks associated with the project. 430 F.3d at 1064-65 ("the Forest Service's conclusion that treating old-growth forest is

beneficial to dependent species is predicated on an unverified hypothesis," and the EIS "treats the prediction that treatment will benefit old-growth dependent species as a fact instead of an untested and debated hypothesis."). Moreover, the Forest Service overlooks evidence in the record suggesting that extended drought shall significantly limit ponderosa pine regeneration and growth many decades into the future (*e.g.*, Brown and Wu 2005, Savage et al. 1996, Seager et al. 2007).

C. The Jacob Ryan Project is Related to Other Actions with Cumulatively Significant Impacts.

To comply with NEPA, the Forest Service must adequately consider the cumulative impacts of all past, present, and reasonably foreseeable projects within and near the Jacob Ryan project area. 40 C.F.R. § 1508.27(b)(7); *see also* 40 C.F.R. § 1508.7 ("Cumulative impact" defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future action," and recognizing that cumulative actions "can result from individually minor but collectively significant actions taking place over a period of time."); 40 C.F.R. § 1508.25(a)(2) (in considering the proper scope for the Jack Smith analysis, the Forest Service must consider "cumulative actions," which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same analysis). If several actions may have a cumulative environmental effect, the environmental consequences must be addressed and disclosed within a single EIS. *Blue Mountains Biodiversity Project*, 161 F.3d at 1214.

The Jacob Ryan EA references other projects near the project area, but fails to adequately address the overall, cumulative impacts of these projects combined with the Jacob Ryan Project. For instance, the EA states that the Forest Service and will undertake post-fire logging in the Warm fire area immediately adjacent to the project area, totaling over 9,000 acres. The EA, however, provides only general, conclusory statements regarding the cumulative impacts of the past, present, and reasonably foreseeable projects near the Jacob Ryan area, particularly regarding potential reductions of snag and coarse wood availability, impacts to soil, loss of wildlife habitat, impacts to water quality, and other cumulative effects on the environment.

The EA fails to provide the detailed, quantified information required by NEPA. *Neighbors of Cuddy Mountain*, 137 F.3d at 1379 ("In accord with NEPA, the Forest Service must 'consider' cumulative impacts. 40 C.F.R. § 1508.25(c). To 'consider' cumulative effects, some quantified or detailed information is required. . . General statements about 'possible' effects and 'some risk' do not constitute a 'hard look' absent a justification regarding why more definitive information could not be provided").

D. The Jacob Ryan Project "Threatens" Violations of NFMA

The Forest Service must also consider "[w]hether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment." 40 C.F.R. § 1508.27(b)(10). As demonstrated above, the Jacob Ryan Project at the very least "threatens" violations of the KNF Plan standards and guidelines for northern goshawk habitat, and this would constitute a 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). The likely violations of the KNF Plan and NFMA indicate that an EIS must be prepared before the Jacob Ryan Project is implemented. 40 C.F.R. § 1508.27(b)(10).

As shown above, numerous of the NEPA "significance" factors demonstrate the need for an EIS for the Jacob Ryan Project. The Forest Service has failed to take the required "hard look" and provide a "convincing statement of reasons" to explain why the impacts of the project are insignificant. *National Parks*, 241 F.3d at 730; *Blue Mountains*, 161 F.3d at 1216. The failure to prepare an EIS for the logging project is therefore unreasonable.

CONCLUSION

In summary, appellants would not appeal reasonable logging, with diameter size limits, within truly overstocked stands in the Jacob Ryan Project area. Likewise we are not opposed to the proposed prescribed burns, meadow enhancement, or other activities that improve spatial heterogeneity of habitat and create forest structural conditions that will support restoration of natural fire disturbance processes. We do oppose, however, the proposed logging of trees greater than 16" dbh in uneven-aged stands and larger than 12" dbh even-aged and goshawk nest stands. Additionally, we oppose implementation of the KNF I&I goshawk guidelines without any NEPA or NFMA compliance, and oppose implementation of a project that fails to comply with mandatory Forest Plan standards and guidelines for northern goshawk habitat structure. Overall, due to the issues set forth above, we believe the record is clear that the Forest Service must prepare an EIS that fully demonstrates compliance with all applicable Forest Plan standards and guidelines before implementing this project.

We look forward to an opportunity to discuss an appeal disposition with you.

Sincerely,

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REFERENCES

Agee, J.K., and C.N. Skinner. 2005. Basic principles of forest fuel reduction treatments. *Forest Ecology and Management* 211:83-96.

Allen, C.D. M.A. Savage, D.A. Falk, K.F. Suckling, T.W. Swetnam, T. Schulke, P.B. Stacey, P. Morgan, M. Hoffman, and J.T. Klingle. 2002. Ecological restoration of southwestern ponderosa pine ecosystems: A broad perspective. *Ecological Applications* 12:1418-1433.

Arno, S.F. 2000. Fire in western ecosystems. Pp. 97-120 in: J.K. Brown and J.K. Smith (Eds.). *Wildland Fire in Ecosystems, Vol. 2: Effects of Fire on Flora*. USDA For. Serv. Gen. Tech. Rep. RMRS-42-vol.2. Ogden, UT.

Brown, P.M., and R. Wu. 2005. Climate and disturbance forcing of episodic tree recruitment in a southwestern ponderosa pine landscape. *Ecology* 86:3030-3038.

Cortner, H.J. 2003. The governance environment: linking science, citizens, and politics. Pp. 70-80 in: P. Friederici (Ed.). *Ecological Restoration of Southwestern Ponderosa Pine Forests*. Island Press: Washington, D.C.

Covington, W.W., and M.M. Moore. 1994. Southwestern ponderosa forest structure: Changes since Euro-American settlement. *Journal of Forestry* 92:39-47.

Drum, R., T. Schulke, T. McKinnon, and J. Lininger. In review. Diameter caps for southwestern ponderosa pine forests: expediting forest restoration by preserving large trees. *Ecological Restoration* xx:xxx.

Friederici, P. (Ed.). 2003. *Ecological Restoration of Southwestern Ponderosa Pine Forests*. Island Press: Washington, DC.

Fulé, P.Z., W.W. Covington, and M.M. Moore. 1997. Determining reference conditions for ecosystem management of Southwestern ponderosa pine forests. *Ecological Applications* 7:895-908.

Herron, M.W. 2006. Email to S. Lovejoy, M. Johnson and J. Waters re: goshawk demo. November 20.

Hunter, M.E., W.D. Shepperd, J.E. Lentile, J.E. Lundquist, M.G. Andreu, J.L. Butler, and F.W. Smith. 2007. *A Comprehensive Guide to Fuels Treatment Practices for Ponderosa Pine in the Black Hills, Colorado Front Range, and Southwest*. USDA For. Serv. Gen. Tech. Rep. RMRS-GTR-198. Fort Collins, CO.

Joos, R. and A. Gatto. 2008. *Biological Evaluation and Specialist Report, Jacob Ryan Vegetation Management Project*. North Kaibab Ranger District, Kaibab National Forest. June. 48 pp.

Noss, R., P. Beier, W. W. Covington, R. E. Grumbine, D. B. Lindenmayer, J. W. Prather, F. Schmiegelow, T. D. Sisk, and D. J. Vosick. 2006. Recommendations for integrating restoration ecology and conservation biology in ponderosa pine forests of the Southwestern United States. *Restoration Ecology* 14:4-10.

Randall-Parker, T., and R. Miller. 2002. Effects of prescribed fire in ponderosa pine on key wildlife habitat components: preliminary results and a method for monitoring. Pp. 823-834 in: W.F. Laudenslayer, et al. (Tech. Coords.). *Proc. Symp. Ecology and Management of Dead Wood in Western Forests*. 1999 November 2-4; Reno, NV. USDA For. Serv. Gen. Tech. Rep. PSW-GTR-181. Albany, CA.

Reynolds, R.T., R.T. Graham, M.H. Reiser, R.L. Bassett, P.L. Kennedy, D.A. Boyce, G. Goodwin, R. Smith, and E.L. Fisher. 1992. *Management Recommendations for the Northern Goshawk in the Southwestern United States*. USDA For. Serv. Gen. Tech. Rep. RM-GTR-217. Fort Collins, CO.

Running, S.W. 2006. Is global warming causing more, larger wildfires? *Science* 313:927.

Sackett, S.S., S.M. Hasse, and M.G. Harrington. 1996. Lessons learned from fire use for restoring Southwestern ponderosa pine ecosystems. In: W.W. Covington, and M.R. Wagner (Eds.). *Conference on Adaptive Ecosystem Restoration and Management: Restoration of Cordilleran Conifer Landscapes of Northern America*. USDA For. Serv. Gen. Tech. Rep. RM-GTR-278. Fort Collins, CO.

Savage, M. P.M. Brown, and J. Feddema. 1996. The role of climate in a pine forest regeneration pulse in the southwestern United States. *Ecoscience* 3:310-318.

USDA Forest Service. 2007a. Forest Inventory and Analysis National Program—Forest Inventory Data Online (FIDO). http://www.fia.fs.fed.us/tools-data/

_____. 2007b. *Implementation Guide, Region 3, Northern Goshawk Standards and Guidelines*. Feburary 23. 22 pp.

_____. 2006. *Final Supplement to the Final Environmental Impact Statement for Amendment of Forest Plans, Arizona and New Mexico*. Southwestern Region, Albuquerque, NM.

_____. 2005. *Implementation and Interpretation of Management Recommendations for the Northern Goshawk, v.2.1*. Kaibab National Forest, Williams, AZ. December. 17 pp.

_____. 1999. Forest Inventory and Analysis National Program—Forest Inventory Data Online (FIDO). http://www.fia.fs.fed.us/tools-data/

_____. 1996. *Record of Decision for Amendment of Forest Plans, Arizona and New Mexico.* Southwestern Region, Albuquerque, NM.

Wallin, K.F., T.E. Kolb, K.R. Skov, and M.R. Wagner. 2003. Effects of crown scorch on ponderosa pine resistance to bark beetles in northern Arizona. *Environmental Entomology* 32:652-661.

Ward, L.Z., D.K. Ward, and T.J. Tibbitts. 1992. *Canopy Density Analysis at Goshawk Nesting Territories on the North Kaibab Ranger District, Kaibab National Forest*. Final Report, Arizona Game and Fish Dept., Phoenix, AZ. April. 15 pp.

Westerling, A.L., H.G. Hidalgo, D.R. Cayan, and T.W. Swetnam. 2006. Warming and earlier spring increase western U.S. forest wildfire activity. *Science* 313:940-943.

Youtz, J. 2006. *Management Recommendations for the Northern Goshawk in the Southwestern United States: Implementation Strategies for Forest Vegetation Management.* PowerPoint presentation, USDA Forest Service Southwestern Region. October. 61 slides.