CENTER FOR BIOLOGICAL DIVERSITY

SIERRA CLUB GRAND CANYON CHAPTER

March 14, 2011

Henry Provencio
4FRI Team Leader
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1814 S. Thompson Street
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Re: Four Forests Restoration Initiative Proposed Action

Dear Mr. Provencio,

The Grand Canyon Chapter of the Sierra Club and Center for Biological Diversity hereby submit Scoping Comments regarding the Four Forest Restoration Initiative as published in the Federal Register on January 25, 2011. Due to statements made by the Forest Service in public meetings, it is our understanding that the comment period closes on March 14, 2011 as opposed to the March 11th date printed in the Federal Register Notice. It is also our understanding that the Forest Service will develop another, more detailed Proposed Action based on comments received on this one. We support that approach, and we will continue to submit comments on the Proposed Action as new iterations are developed and details become clearer.

We support the Forest Service's stated goal of focusing management of Mogollon Plateau ponderosa pine forests on ecological restoration. Since European settlement in the middle to late 1800s pervasive changes have homogenized ponderosa pine forests in the Southwest. Logging has decreased the number of old and large trees. Livestock grazing and fire suppression have promoted unnaturally dense stands of small trees. This condition threatens the remaining large trees and ecological systems through competition and by fueling increasingly extensive crown fires. Alteration of stand structures and species compositions has in turn altered natural processes. Understory grasses and forbs have decreased in abundance and diversity, replaced by deep mats of pine needles. Nutrient cycling dynamics have been disrupted and overall biodiversity levels decreased. Old-growth ponderosa pine forests have become rare and meadows have shrunk due to tree encroachment. Some vertebrate animal species, such as the Northern Goshawk and Mexican Spotted Owl have declined in abundance due to habitat alterations. Others, such as wolves, jaguar, grizzly bear and Merriam’s elk have been extirpated or driven extinct. Non-native species have displaced native species and road construction has fragmented

forest habitats. An increase in number, size, and severity of stand-replacing fires threatens both human and ecological communities. The aftermath of such fires includes short term amplification of erosion and flooding. Landscape scars created by total canopy destruction may persist as grasslands, shrublands or small tree thickets for decades to centuries. If the current trajectories of anthropogenically driven change continue, serious ecological damage to ponderosa pine ecosystems will accumulate and, with global climate change, likely accelerate. These worrisome trends have long been evident to forest scientists and ecologists and have led to a broad scientific, social, and political consensus that restoration of southwestern ponderosa pine forest ecosystems is necessary and urgent to conserve the ecological systems upon which native biological diversity and human society commonly depend.

Ecological restoration in northern Arizona ponderosa pine forests is a corrective step to safely re-establish and conserve self-regulating ecological systems and their full suite of native biological diversity. We recognize that doing so involves a comprehensive program that strategically integrates community protection, ecological restoration, fire management and biodiversity protection in a landscape context. A central outcome of these efforts is to facilitate the safe management and re-establishment of ecologically beneficial fire regimes at landscape scales. Strategically located and sequenced treatments that conserve large trees and reduce small tree densities will facilitate the re-establishment of natural frequent surface fire regimes and the conservation of native species, including populations of canopy dependent wildlife species, within treatments and adjacent landscapes. Because fire regimes naturally track variability in climate, and because fire plays a keystone ecological role shaping forest structure and composition, ecological restoration that leads to the re-establishment of more natural fire regimes at landscape scales will allow forest changes to track climate changes over time. Coupled with other restorative management, strategically reducing small tree densities and re-establishing frequent fire regimes will also increase the resilience and persistence of ponderosa pine forest ecosystems and biological diversity therein by reducing the potential for and extent of rapid, widespread forest dieback amidst anticipated global climate change. The correction and release of heretofore heavily managed forest ecosystems into a self-regulating, disturbance-maintained condition in wildlands is both in conceptual and applied terms fundamentally different than industrial forestry management models such as and including sustained yield management. The release of heretofore heavily managed forest ecosystems into a self-regulating, disturbance-maintained condition will yield ecological benefits including resilience, heterogeneity, adaptation, carbon sequestration and conservation of native biological diversity in the coming century of global climate change.

It is toward these ends that we support the Forest Service's stated goal of focusing management of Mogollon Plateau ponderosa pine forests on ecological restoration. Our understanding is that the Forest Service will use comments received in this round of scoping to revise and re-issue its proposed action with greater specificity. We strongly encourage the Forest Service to take that step, and additional scoping steps as necessary to develop a proposed action that is sufficiently specific to facilitate meaningful public comment, issue identification and alternative development. While we support the Forest Service stated desire to focus management on ecosystem restoration, the Proposed Action does not contain enough information to determine

a site-specific outcome. It is unclear from the Proposed Action, the public presentations and information on proposed treatment approaches what impacts will occur to forest structure; information regarding residual tree densities, diameters, basal areas, canopy densities, soild, watershed and wildlife are necessary to determine possible impacts of the proposed action.

As a part of the public scoping process a number of significant issues have emerged which will need to be addressed.

1. Issue Number One: NEPA Requires Site-specific Analysis

The scale of the project being proposed would normally be analyzed in a programmatic document to be followed by tiered, site-specific analysis for treatment at smaller scales. The process as currently proposed requires a site specific analysis across 750,000 acres, covering activities over a 10 year period. As discussed in the following comments, we are being asked to comment on a Proposed Action that does not provide enough information regarding treatments and potential post treatment impacts. For example, the proposed action and public meetings have failed to provide information necessary for the public to understand even basic post-treatment stand structure characteristics (tree densities, size class distributions, canopy cover) in treatments proposed by the Forest Service. The significance of the lack of specifics and analysis detail for the Proposed Action is that the process, as currently proposed, will limit the public's ability to raise issues based on an evaluation of a detailed proposed action; this in turn precludes those issues from being addressed through the development of alternatives in the planning process. Thus, this lack of specificity in the Proposed Action undermines the entire NEPA process; it is our understanding based on statements made by Forest Service personnel in meetings that these comments will be used to develop a second, more specific proposed action that will also be scoped. We strongly encourage the Forest Service to take that step, and additional scoping steps as necessary to develop a proposed action that is sufficiently specific to facilitate meaningful public comment, issue identification and alternative development.

We remain concerned that a programmatic EIS followed by tiered, site-specific actions would best serve the 4FRI project, and that the scale of the Proposed Action may preclude satisfying NEPA's site-specific requirements. *See* Salmon River Concerned Citizens v. Robertson, 32 F.3d 1346 (9th Cir. 1994) (SRCC) (because the government made clear it would prepare site-specific EAs and "tier" back to the programmatic EIS, the court upheld the EIS.); Marble Mountain Audubon Society v. Rice, 914 F.2d 179, 182 (9th Cir. 1990) (unless the programmatic documents address site-specific impacts, they must be addressed in individual NEPA documents tiered to broader planning documents); Neighbors of Cuddy Mountain v. U.S. Forest Service, 137 F.3d 1372, 1380 (9th Cir. 1998) ("Nor is it appropriate to defer consideration

of cumulative impacts to a future date"). *See also* Pit River Tribe v. U.S. Forest Service, 469 F.3d 768, 784 (9th Cir. 2006); Nat'l Parks Conservation Ass'n v. Babbitt, 241 F.3d 722 (9th Cir. 2001) (NPCA); (NEPA analysis must be conducted "before a decision that may have a significant adverse impact on the environment is made."); 40 C.F.R. 1500.1(b), 1502.5, 1506.1.

The court in *City of Tenakee Springs v. Block* provides a definition of a programmatic EIS: "A programmatic environmental impact statement is a broad-based, long range plan that discusses the overall environmental impacts of a proposed action."[1] Tiering refers to the process of preparing a broad statement and subsequently narrowing the focus of the NEPA analysis.[2] The first tier in the programmatic EIS "'should focus on broad issues such as mode choice, general location and area-wide air quality and land use implications of alternative transportation systems.'" The programmatic EIS should reflect the "broad environmental consequences…" and be forward looking.[3] The second tier includes the site-specific EISs.[4] As a practical matter, this sort of NEPA vehicle seems well-suited to necessarily hierarchical planning, implementation and monitoring needs of the Four Forests Restoration Initiative.

We are also concerned that entire 4FRI effort spanning a 2.4 million acre focal area could be legitimately construed as a single proposed action warranting analysis in one singular programmatic EIS, and that a programmatic EIS, under the letter of the law, is in fact the proper NEPA vehicle for the effort. In *Kleppe v. Sierra Club*, the U.S. Supreme Court stated the principle that if the government agency has not made a certain proposal, normally a dissatisfied group of citizens cannot force the agency to combine several truly separate projects into a single

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[1] *City of Tenakee Springs v. Block*, 778 F. 2d 1402, 1403 n.1 (9th Cir. 1985) (citing *Nat'l Wildlife Fed. v. U.S. Forest Serv.*, 592 F. Supp. 931, 940 n. 17 (D. Or. 1984)), *amended on other grounds, Nat'l Wildlife Fed. v. U.S. Forest Serv.*, 643 F. Supp. 653 (D. Or. 1984), *order vacated in part, appeal dismissed in part, Nat'l Wildlife Fed. v. U.S. Forest Serv.*, 801 F.2d 360 (9th Cir. 1986).

[2] 40 C.F.R. §§ 1502.20, 1508.28.

[3] *See Nat'l Wildlife Fed. v. Appalachian Reg'l Comm'n*, 677 F.2d 883, 888 (finding that a programmatic EIS was not required for a large scale highway project that had already been partially completed and project specific EISs were being conducted) citing *Kleppe*, 427 U.S. at 413).

[4] 40 C.F.R. § 1508.28.

environmental impact statement. The reverse of that same principle is that when an agency has made a comprehensive proposal, it has no choice but to evaluate the entire proposal in the EIS. *Kleppe v. Sierra Club*, 427 U.S. at 409. In addition to using the CEQ regulation's definition of "connected" action, the Ninth Circuit applies an "independent utility" test to determine if actions are "connected." *Wetland Action Network v. United States Army Corps of Eng'rs,* 222 F.3d 1105, 1118 (9th Cir. 2000). When one of the projects may reasonably be completed without the other, the two projects have independent utility and are not 'connected' for NEPA purposes. *Native Ecosystems Council v. Dombeck,* 304 F.3d 886, 894 (9th Cir. 2002). The thrust of the test is whether the connected actions, those that are necessary for independent utility, must be considered as part of the logical end.

The phrase "independent utility" is applied in the Ninth Circuit to mean "utility such that the agency might reasonably consider constructing only the segment in question." *Thomas,* 753 F.2d at 760. The court provides some further insight in *Trout Unlimited v. Morton,* 509 F.2d 1276 (9th Cir. 1974), stating that an EIS must address subsequent phases of development when "[t]he dependency is such that it would be irrational, or at least unwise, to undertake the first phase if subsequent phases were not also undertaken." *Id.* at 1285, quoted in *Thomas,* 753 F.2d at 759. This discussion could go on, but certainly, in the case of the "Four Forests Restoration Initiative," including only one phase involving only two of those four forests in a single EIS could be reasonably construed as "irrational," at least when viewed through the lens of the law. Again, we maintain that a Programmatic Environmental Impact Statement would remedy this potential problem.

2. Issue: The Proposed Action Should Describe the Affirmative Goal of Safely Restoring Natural Fire Regimes and How Strategically Placed Treatments Deployed Within Firescapes Will Facilitate the Management of Planned and Unplanned Ignitions

The proposed action should describe the project in the context of Federal Wildland Fire Policy and its goals of facilitating public and firefighter safety and maximizing fire's natural role in wildland ecosystems.

> "Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, and across agency boundaries. Response to wildland fire is based on ecological, social, and legal consequences of fire. The circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected dictate the appropriate management response to fire."

1995/2001 Federal Wildland Fire Management Policy. The proposed action should discuss the affirmative goal of restoring fire as a critical natural process rather than focusing on the negative goal of avoiding undesirable fires. The proposed action should discuss and present the idea of firescapes and strategically placed treatments in the context of safely managing planned and unplanned ignitions, including restoring fire as a critical natural process.

In the former case, the proposed action should describe Firescapes as a geographic context within which to plan and deploy strategically placed treatments that can facilitate safely managing planned and unplanned ignitions. We refer the Forest Service to the definition and description of Firescapes in the 4FRI Stakeholders' Landscape Strategy document; we suggest the Forest Service use this definition and description to provide additional clarity and specificity to the purpose of Firescapes as an geographic context for planning and deploying strategically placed treatments in a way that serves fire management goals.

In the latter case, the proposed action should provide additional detail on the relationship between strategically placed treatments and fire management. Specifically, the proposed action should describe how restoration treatments can be strategically designed, located and sequenced to efficiently and safely facilitate operational fire management, community protection, and landscape-scale restoration of ecologically beneficial fire regimes at landscape scales. Toward that end, some key questions that the Forest Service should be seeking to answer in the proposed action and subsequent analyses are:

- Where and under what conditions can natural ignitions be managed for resource benefit under current Fire Management Plans?

- Where can treatments be located to facilitate containment and management of planned or unplanned ignitions within firescapes or subsets thereof?

- How can treatments be positioned and sequenced to most efficiently reduce the potential for landscape-scale crown fire?

Treatment units should be distributed in the project area with spatial patterns of crown fire spread in mind. Overlapping patterns of fuel treatment that reduce horizontal fuel continuity can fragment severe fire behavior and effects into smaller patches if they disrupt heading fire behavior and increase the area burned by fires exhibiting flanking behavior as they move upslope (Finney 2001). Slope aspects facing away from frontal or diurnal winds are a lesser priority for treatments because backing fires likely to occur on those sites are the most likely to exhibit mild intensity and cause low-severity effects to vegetation and soil with attendant benefits to ecosystem resources and fire worker safety.

The direction of fire spread (backing, flanking, heading) is an important aspect of fire behavior because fire interacts with weather, topography and vegetation to "back" and "flank"

around certain fuel and topographic conditions or "head" through others as it moves across the landscape (Graham et al. 2004). Steep slopes can facilitate wind-driven convection currents that drive radiant heat upward and bring flames nearer to adjacent unburned vegetation, pre-heating fuels and amplifying fire intensity as it moves upslope (Whelan 1995). As a result, severe fire effects typically concentrate at upper slope positions and on ridges, whereas such effects are relatively rare on the lee side of slopes that do not directly receive frontal wind (Finney 2001).

For starters, we suggest the Forest Service consider targeting treatments in fire suppressed VSS 3 stands that are (1) within ¼ mile of roads, (2) that exhibit active or passive crown fire behavior under 95th percentile conditions, and that (3) occur in patches of 50 acres or larger. We also urge the Forest Service to carefully review rationale and analyses employed in the 4FRI Landscape Strategy; the analyses unpinning that document reflect careful thinking about linking restoration and fire management goals in a landscape context. The Forest Service should explicitly include thinning with fire, either in single or multiple, repeated events, within the range of treatment options. Acres precluded from mechanical treatment should not automatically be excluded from fire use; rather, the planning document should consider thinned and non-thinned areas together within a landscape matrix that can safely accommodate natural fires with beneficial ecological effects.

Another approach to strategic location of fuel treatments is to identify landscape features that are currently resilient to fire disturbance and use those sites as anchor points for compartmentalization of the project area for long-term fire management oriented to use of unplanned ignitions for resource benefits. Such sites may include natural openings, meadows, relatively open ridges, riparian areas, patches of mature forest with relatively shaded and cool microclimates, and sites where fuel reduction work already has been completed. Such locations can facilitate appropriate fire management responses including confinement and containment strategies as alternatives to full control, as well as provide safe areas for workers to ignite prescribed fires for hazardous fuel reduction and ecological process restoration. Identification of such sites does not necessarily equate to actively treating them. Landscape features that are currently fire resilient, as well as proposed fuel treatment areas, should be spatially mapped and distinguished in analysis of the proposed action.

The Forest Service also can prioritize active fuel management in areas where relatively little resource investment may create relatively fire resilient stand conditions. This may include low-productivity sites with little encroachment of small trees (e.g., dry southerly aspects) and relatively open stands that are currently dominated by large conifers. Targeting work in these areas will maximize the area treated and the effectiveness of treatments with available funds and personnel, and thereby provide the greatest opportunity to quickly reduce fuels and restore ecosystem function at larger spatial scales.

3. Issue : Tree-mortality and Other Structural Changes Resulting From Fire Use

The EIS must describe tree mortality and other structural changes resulting from restoration treatments and from fire management following treatments on an ongoing basis. That is, the forest structure resulting from thinning, or the forest structure today in areas that will go unthinned, will change over time by virtue of fire effects. The EIS needs to characterize those ongoing changes and incorporate them into forest modeling. Losses of canopy, large trees, small trees and resulting recruitment of logs and snags will affect long-term forest dynamics, stand development and wildlife habitat suitability. We urge the Forest Service to exhibit caution in so doing: Post-treatment large tree mortality have exceeded planning targets at several restoration sites in northern Arizona.

4. Issue: Limiting Vegetative Structural Stage Distribution and Canopy Cover Requirements to the Group Scale Would Violate NFMA and Harm Canopy-dependent Species

Pursuant to NFMA, "the Forest Service must demonstrate that a site-specific project would be consistent with the land and resource management plan of the entire forest." *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1377 (9th Cir. 1998), *citing* 16 U.S.C. § 1604(i); 36 C.F.R. § 219.10(e). In 1996, the Forest Service amended all Forest Plan in the Southwest Region, including the CNF Plan, to provide additional standards and guidelines for northern goshawks. The Forest Service must demonstrate that the project will comply with the mandatory standards and guidelines for the northern goshawk.

The existing amended forest plans, including the Coconino Forest Plan, incorporate the *Management Recommendations for the Northern Goshawk in the Southwestern United States* (Reynolds et al. 1992), which define northern goshawk habitat through the structural habitat attributes of 14 of the hawk's prey species. In two environmental impact statements that based action alternatives on the recommendations, the Forest Service established a habitat-proxy relationship of specifically quantified attributes of ponderosa forest structure and viability of northern goshawk and 14 other vertebrate species that comprise its prey base (USDA 1996, 2006).

Appendix C to the 1996 Record of Decision for the northern goshawk plan amendments sets forth the mandatory standards and guidelines for ecosystem management within Northern goshawk habitats, and these standards and guidelines have been incorporated into the CNF Plan. *See* CNF Plan at 65-7 through 65-11. These standards and guidelines apply to all forested lands that are outside the protected areas for the Mexican Spotted Owl. CNF Plan at 65-7. 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 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 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.

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

The Arizona Game and Fish Department has stated that application of canopy cover guidelines at small tree group scales instead of at larger forest stand scales in mature and old growth ponderosa forest has the potential to significantly reduce the amount of forest cover within treated areas, with detrimental consequences to goshawk and its prey.[5] For example, assuming a residual canopy cover within groups of 50 percent, and if groups occupy 50 percent of the stand, canopy cover at the stand scale will be 25 percent, far below required minimums.

To prevent this outcome across project areas, the *Management Recommendations* and the amended forest plans incorporating them clearly require maintenance of canopy cover at stand

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[5] See notes of Arizona Game and Fish Deptartment Region II Commission Briefing, July 27, 2007, attached to these comments for convenience. In it, the Department explains, "the Management Recommendations for the Northern Goshawk in the Southwestern United States (GTR-RM-217) defines northern goshawk habitat through the structural habitat attributes of 14 of the hawk's prey species. The canopy cover data described for these prey species, and for the northern goshawk, were measured at the stand level – not the tree group level. By changing the canopy cover targets from the stand level to the group level, the Department is concerned that the Forest Service may not be meeting the habitat requirements for those 14 wildlife species, and also may not be meeting the habitat requirements for the northern goshawk per the 1996 Forest Plan Amendment."

scales in older ponderosa forest. As listed above, minimum canopy cover values within and outside of PFAs and nesting areas in VSS 4, 5 and 6 are plainly among the required habitat structures in the standards and guidelines, and "required habitat structures… 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." Further, the required habitat structures explicitly apply to Nest Areas, Post-fledging Family Areas (PFA) and Foraging Areas, all of which occur at scales larger than the group level. The described stand structures are to occur across 30 acres for nest areas, 420 acres for PFAs and 5,400 acres for foraging areas. Additional desired conditions for each forest type are also described in terms of stand (not group) characteristics.

Restricting minimum canopy cover requirements to groups and excluding inter-space from canopy tallies within VSS 4, 5 and 6 also conflicts the plain language of the *Management Recommendations for the Northern Goshawk in the Southwestern United States* (Reynolds et al. 1992), which the existing amended forest plans, including the Coconino Forest Plan, incorporate. That document plainly states that, "Vegetation structural stage (VSS) is a method of describing the growth stages of a stand of living trees. It is based on tree size (DBH) and total canopy cover." (Appendix 5, MRNG), where VSS is "A generalized description of forest growth and aging stages based on the majority of the trees in the specific diameter distribution of the stand." (Glossary of Terms, MRNG).

The Forest Service needs to explain how using a silvicultural tool designed for the stand level can accurately be used to create groups and canopy restricted to the group scale. Achieving structural stages at only the group level could allow a significantly higher number of canopy openings with smaller numbers of trees between those openings. Using Vegetative Structural Stage (VSS) data to determine canopy or forest structure at the group level could present a false picture of stand conditions and associated canopy.

The goshawk prey species analysis underpinning the MRNGs was based on the prey species' use of small to large contiguous patch sizes with varying canopy densities. Prey species' home ranges vary in size from half an acre to miles. In providing habitat for prey species, the goal of the MRNG was to result in a mosaic of interspersed vegetative structural stages in large landscape units. (Page 30, MRNG, RM-217) Measuring structural stages and the associated canopy densities at the group level only is inconsistent with the science underpinning the MRNGs, the 1996 ROD, and will likely have deleterious effects on northern goshawk and its prey species by failing to provide adequate canopy cover in VSS 4, 5 and 6 at multiple scales. The consequence of such effects cannot be downplayed in the context of the proposed project: its scale could entail population-level impacts to the goshawk and its prey species. Notably, the latest report of the Kaibab National Forest on management indicator species habitat and population trends (USDA 2010) states that the source population of northern goshawk on the

Kaibab Plateau is in decline, and the species is "at risk of extirpation or extinction in Arizona." The Forest Service must ensure that the project will not adversely affect goshawk or contribute to a trend toward listing under the Endangered Species Act.

In public meetings the Forest Service personnel have also stated that the MRNG did not specify the levels of analysis to take place regarding impacts to canopy. However, the June 1996 Regional forest plan amendments, which provide the binding standards and guidelines for logging within goshawk habitat, state the following: "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 level, at the mid-scale such as drainage, and at the small scale of site." (Record of Decision for amendment of forest plans, p.92).

This multi-leveled approach is critical. For instance, a goshawk PFA may not meet the desired VSS distribution and may not be adequately represented at the VSS 1 level, however, the larger analysis area may have a surplus of VSS 1. When determining dense canopy cover in older age classes, a multi-level approach gives a more accurate picture of over all forest structure. While the Coconino and South Kaibab National Forests may be able to achieve the larger tree group and dense canopy requirements at the group scale, they are less likely to be achieved at the stand and landscape scales. Such an analysis would indicate the need to manage for a mature forest component.

5. Issue: Old Growth

In addition to specific requirements for northern goshawks, the 1996 Forest Plan Amendment for the Southwest Region also includes mandatory standards for old growth habitat. Each national forest, including the CNF, must allocate no less than 20 percent of each forested "ecosystem management area" to old growth habitat. CNF Plan at 70-1. In order to properly determine old growth habitat, the Forest Service must refer to a specific table included in the both the 1996 Plan Amendment and CNF Plan, which sets forth the detailed, minimum numeric criteria for various forest types, including the size, age, and number of live and dead trees, down trees, and canopy cover. CNF Plan at 70-2.

Forested sites must meet or exceed these numeric structural attributes in order to be considered old growth habitat. CNF Plan at 70-1. In addition, the CNF Plan requires the Forest Service to analyze old growth habitat at multiple scales – (1) the ecosystem management area; (2) one scale above the ecosystem management area; and (3) one scale below the ecosystem management area. CNF Plan at 70-1; *see also* New Goshawk Guidelines, p. 11 ("all forest plans require analysis of old growth at multiple scales"). The amount of old growth that can be provided and maintained must be evaluated at the ecosystem management level and be based on forest type, site capability, and disturbance regimes. CNF Plan at 70-1.

Old Growth is essential to many species inhabiting the Coconino and Kaibab National Forest because it provides habitat attributes not found in younger forests. These include large, old trees, large standing dead trees, vertical and horizontal structural diversity, nesting cavities, broken tops, and fire resistant "plated" bark structure. In addition to these important habitat characteristics, old growth provides a host of ecological services including overall watershed function, clean water, soil retention, and storage of greenhouse gasses.

The Proposed Action notes the Forest Plan direction to "Manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape." The revised proposed action should clearly state that no old growth trees will be cut and should designate old growth to its maximal possible extent across the landscape.

6. Issue: Treatment Openings

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

7. Issue: Invasive Plants

Domestic livestock, as well as logging, prescribed fire, and other practices that disturb soils, spread alien weedy species in ponderosa forests (Johnson et al. 1994). Livestock act as vectors for seed travel, disturb the soil, and reduce the competitive and reproductive capacities of native species. Exotic weeds can displace native species, in part, because native grasses are not adapted to frequent and close grazing (Mack and Thompson 1982, Belsky and Blumenthal 1997). In some portions of the planning area, although the locations relative to active grazing allotments is not disclosed, aggressive alien weeds such as cheatgrass (*Bromus tectorum*) and spotted knapweed (*Centaurea maculosa*) have displaced native species. EA at 164. The potential for significant cumulative impacts of noxious weed spread in the project area is high because McGlone and others (2009) showed that cheatgrass abundance and distribution increased 90-fold above a pre-treatment baseline as a result of forest treatments similar to the proposed action.

The presence of cheatgrass has important long-term implications for native plant communities. Melgoza and co-workers (1990) studied cheatgrass soil resource acquisition after fire and note its competitive success owing to its ability suppress the water uptake and

productivity of native species for extended periods of time. They further note that cheatgrass dominance is enhanced by its high tolerance to grazing (also see Mack 1981).

Cheatgrass is well adapted to fire and often dominates plant communities after disturbance (Young et al. 1969). Its annual life-form coupled with the abilities to germinate readily over a wide range of moisture and temperature conditions, to quickly establish an extensive root system, and to grow early in the spring contribute to its successful colonization (Melgoza et al. 1990). Some native species also exhibit this trait, but greenhouse and field studies show that cheatgrass effectively competes with seedlings of perennial species (Hull 1963, Harris 1967, Evans et al. 1970, Harris and Wilson 1970). In addition, Melgoza and others (1990) show that cheatgrass successfully competes with the native species that survive fire, despite these plants being well-established adult individuals able to reach deeper levels in the soil. This competitive ability of cheatgrass contributes to its post-fire dominance.

8. Issue: Domestic Livestock Grazing

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

There is a substantial body of scientific literature that identifies livestock grazing as a major factor in the alteration of historic fire regimes and a contributor to fire hazard (Arnold 1950, Cooper 1960, Madany and West 1983, Mitchell and Freeman 1993, Rummell 1951, Savage and Swetnam 1994). This is true for five reasons.

First, livestock grazing removes the grasses that compete with tree seedlings for water and nutrients. This favors the establishment of deep rooted trees and allows them to dominate affected sites. Studies of ungrazed sites in several ponderosa pine dominated ecosystems found that in the absence of livestock grazing, and in the absence of fire, open ponderosa pine forests with a minimum of understory pine seedling establishment was documented (Madany and West 1983, Rummell 1951).

Second, most tree species require bare soil for successful germination and, grazing that removes the grassy understory and creates bare disturbed soil conditions that favors tree establishment. This has led to excessive tree-stocking density in many locations (Belsky and Blumenthal 1997).

Third, grazing removes fine fuels such as grasses that otherwise may help to carry the light intensity fires that once burned at regular intervals in the planning area. This has permitted young saplings and trees to become established and be recruited into the forest stand (Arnold 1950, Savage and Swetnam 1994).

Fourth, by permitting a large number of small saplings to become established, competition for water among existing living trees is increased making trees more vulnerable to insects and other pathogens (Hessburg et al 1994). Under extreme drought such trees are actually more flammable than a dead tree since internal water content is often less than kiln-dried lumber. Flammable resins found in living, drought-stressed trees may explode into flames upon contact with fire.

Fifth, by contributing to the spread and persistence of easily ignited weedy species like cheatgrass, livestock production has created far more acres of highly flammable plant communities (Belsky and Gelbard 2000, Billings 1990, Mack 1981).

9. Issue: Stand Density Index

The Forest Service needs to describe in detail how the Stand Density Index (SDI) will be used in developing treatment approaches described in the Proposed Action and public meetings. SDI was designed for use in even-aged management scenarios. The Proposed Action is planning on restoring an uneven-aged forest structure. How the use of SDI relates to ecological restoration goals remains unclear.

10. Issue: Threatened and Endangered Species

Section 7 of the Endangered Species Act ("ESA") requires the Forest Service, in consultation with the U.S. Fish and Wildlife Service ("FWS"), to insure that any action authorized, funded, or carried out by the agency is not likely to (1) jeopardize the continued existence of any threatened or endangered species or (2) result in the destruction or adverse modification of the critical habitat of such species. 16 U.S.C. § 1536(a)(2). "Action" is broadly defined to include all activities or programs of any kind authorized, funded, or carried out by

federal agencies, including actions directly or indirectly causing modifications to the land, water, or air; and actions intended to conserve listed species or their habitat. 50 C.F.R. § 402.02.

Section 7(a)(2) of the ESA requires all federal agencies to "insure" that any action they undertake or authorize is "not likely to jeopardize the continued existence of any endangered species or threatened species"; this is the duty to "insure no jeopardy." *Id.* § 1536(a)(2). This duty is one of the ESA's clearest cornerstones for the conservation of listed species. As the Supreme Court has acknowledged, "[o]ne would be hard pressed to find a statutory provision whose terms were any plainer than those in § 7 of the [ESA]." *TVA*, 437 U.S. at 173.

The ESA's implementing regulations set forth a specific process, fulfillment of which is the only means by which an action agency ensures that its affirmative duties under Section 7(a)(2) are satisfied. 50 C.F.R. § 402.14(a); *Sierra Club v. Babbitt*, 65 F.3d 1502, 1504-05 (9th Cir. 1995). By this process, each federal agency must review its "actions" at "the earliest possible time" to determine whether any action "may affect" listed species or critical habitat in the "action area." 50 C.F.R. § 402.14. The definition of agency "action" is broad and includes "actions directly or indirectly causing modifications to the land, water, or air." 50 C.F.R. § 402.02. The "action area" is defined to mean all areas that would be "affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." *Id*. The term "may affect" is also broadly construed to include "[a]ny possible effect, whether beneficial, benign, adverse, or of an undetermined character". 51 Fed. Reg. at 19926. If a "may affect" determination is made, "formal consultation" is required.[6]

In formal consultation, after evaluating all relevant information, FWS prepares a "biological opinion" ("BiOp"), which considers the current status of the species, the environmental baseline, and the effects of the proposed action, and concludes "whether the action, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species… ." *Id.* § 402.14(g)(2)-(4). The BiOp is the heart of the Section 7 consultation

[6] The process leading up to formal consultation is called "informal consultation." 50 C.F.R. § 402.02.

process, and results in either a "likely to jeopardize" or a "no jeopardy" conclusion. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(h)(3). To "jeopardize" to mean "engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02. This requires FWS to consider "both recovery and survival impacts." *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 931 (9th Cir. 2008).

If "jeopardy" is likely, FWS must prescribe in the BiOp "reasonable and prudent alternatives" to avoid that result. 50 C.F.R. § 402.14(i)(1)(ii). If FWS concludes that the project is not likely to jeopardize listed species, it must provide an "incidental take statement" ("ITS") with the BiOp that specifies the amount or extent of such incidental take, the "reasonable and prudent measures" that FWS considers necessary or appropriate to minimize such take, and the "terms and conditions" that must be complied with by the action agency or any applicant to implement any reasonable and prudent measures, as well as other details. *Nat'l Wildlife Fed'n v. Nat'l Marine Fish. Serv.*, 481 F.3d 1224, 1230 (9th Cir. 2007); 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i).

Section 7(a)(1) of the ESA directs all federal agencies to consult with the Secretary and "utilize their authorities in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered species and threatened species … ." 16 U.S.C. § 1536(a)(1). Thus, pursuant to Section 7(a)(1) of the ESA, the Forest Service must undertake formal consultations with the U.S. Fish and Wildlife Service to ensure that the proposed action "insure" that the project is "not likely to jeopardize the continued existence of any endangered species or threatened species"; this is the duty to "insure no jeopardy."

As the Forest Service is aware, the species most likely to be impacted by the Proposed Action is Mexican spotted owl. As the Forest Service is also aware, the Forest Service has been, on an ongoing basis, violating the mandatory terms and conditions set forth in the 2005 biological opinion concerning the implementation of the Forest Plans in the Southwest Region, including mandatory monitoring requirements for the Mexican spotted owl, in violation of the ESA. 16 U.S.C. § 1536(b)(4)(C)(iv); 50 C.F.R. §§ 402.14(i)(1)(iv), and 402.14(i)(3). Due to these monitoring failures, the Forest Service is also failing to insure that it has not exceeded the incidental take allowances for these species. Through its failure to comply with the monitoring requirements that are included within the terms and conditions of the 2005 biological opinion[7], and through its failure to insure that it has not exceeded the incidental take limits for these listed species, the Forest Service is thereby failing to insure that the Coconino Forest Plan and projects that implement the plan are not likely to jeopardize the continued existence of Mexican spotted owl, or result in the destruction or adverse modification of critical habitat. 16 U.S.C. § 1536(a)(2). The Forest Service has also failed to complete consultation with FWS regarding impacts of the Coconino Forest Plan on the owl and its critical habitat, in violation of the ESA. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.16.

Because the Forest Service is in ongoing violation of the 2005 programmatic biological opinion's terms and conditions for the Mexican spotted owl, among other species, any take of these species – incidental or otherwise – is no longer covered by the programmatic biological opinion and would be in violation of Section 9 of the ESA. *See* 16 U.S.C. 1536(o)(2); 16 U.S.C. 1538. Therefore, until the Forest Service has completed its reinitiated consultation with the U.S. Fish and Wildlife Service regarding impacts of implementing Land and Resource Management Plans in the region on Mexican spotted owls and other species, any projects implementing those

[7] The Forest Service typically monitored only 20-25% of PACs during 2005-07. Moreover, PACs have been monitored for owl occupancy but not owl reproduction. The Forest Service states in the annual report that personnel and funding levels are not adequate to meet the monitoring requirements set out in Term and Condition 3.1. As a result, in many cases, monitoring has not been accomplished. In addition, the Forest Service claims in the report that the incidental take issued by the biological opinion is difficult to understand at the Forest level.

Plans, including the Proposed Action, must avoid take of Mexican spotted owl to avoid violating Section 7(d) and 9 of the ESA. 16 U.S.C. § 1538(a)(1); 16 U.S.C. 1536(d); 50 C.F.R. § 17.31(a).

11. Issue: Soils

The proposed action should identify soil types on which mechanical treatments, piling and pile burning should be prohibited owing to vulnerability to soil disturbance. It should also include mandatory procedures for preventing soil erosion during mechanical treatments. We are not at all convinced that best management practices will prevent unacceptably detrimental soil conditions where ground-based log skidding occurs. The EIS should relate slope steepness to soil erosion hazard or soil structure throughout the project area; it should disclose exactly where ground-based skidding and mechanical treatments may and should not occur. The Forest Service should evaluate soil erosion hazard at multiple scales, using watersheds and sub-watersheds to delineate between those scales.

12. Issue: Non-forested land allocations

The proposed action and public meetings have described savannahs, grassland and other ecological communities that may or not be Management Areas set forth in governing Land and Resource Management Plans. The Forest Service needs to describe the scientific and policy basis for those delineations. The Forest Service also needs to describe how treatments proposed therein comply with the standards and guidelines for northern goshawk and Mexican spotted owl.

13. Issue: General Restoration Objectives

The only way to restore and develop old growth as a natural process at the landscape scale is to preserve the old growth components that currently exist. This can best be accomplished by retaining old growth components such as yellow pines and large trees at the individual and group levels while identifying stands that as a whole generally exhibit old growth characteristics. The goal is to provide as much old growth as can be sustained in patterns that provide for a flow of functions and interactions at multiple scales across the landscape through time. While old growth is a term generally used to describe ecosystem function, it is also increasingly used by the public, academics and even some land managers to describe individual trees with the characteristics described below in "A."

(A) Retain old growth trees regardless of size, as old growth is a function of age, not size. Old growth is not a definitive age. Ponderosa pines begin to develop the thick yellow bark characteristic of an old growth tree between 120 and 150 years of age. As they

age, the yellow-red bark also develops wide, large plates. In addition to bark characteristics, an old growth ponderosa pine tree typically exhibits complex structural attributes such as full crowns, flattened tops and large limbs. These trees are sometimes referred to as yellow pines, presettlement trees or mature trees. (Note that "The Path Forward" dated March 19, 2010, a document guiding the Four Forests Restoration Initiative uses the following language: "**8.No old growth trees (predating Euro-American settlement) shall be cut.")**

(B) When creating openings, protect old growth trees by removing excess competition from small, young trees. Initially, removal should focus on, but not be restricted to, trees 12 inches in diameter and smaller. Such a focus is warranted given the high density and high percentage of the forest landscape these trees occupy. According to the USDA, more than 82 percent of ponderosa pine trees in Region Three are smaller than 11 inches in diameter. (USDA, 1999 & 2007) Thinning should occur within groups, as well as in identified openings between groups.

(C) Reduce the fire risk to old growth trees by removing small, younger trees, as well as some mid-aged trees, (VSS 4: 12 to 18 dbh) from within the drip lines of individual trees. Given the lack of trees larger than 16 inches in diameter, thinning should focus on trees smaller than 16 inches in diameter. Approximately 96 percent of the trees in Region Three are smaller than 15 inches in diameter (USDA, 1999 & 2007). This would reduce ladder fuels, lowering the potential for crown fires. It would also encourage the growth of an understory community.

(D) When developing future old growth stands and managing for mature age classes, larger diameter trees, in VSS 4, 5 and 6 should be retained to replace the structure and function of old growth trees that were removed by logging.

(E) To provide for an unevenaged structure, within old growth stands, retain groups of young and mid-aged trees to provide for multiple age classes and enhance structural diversity. Thin variably within retained groups, removing ladder fuels and avoiding even spacing.

(F) Identify and retain areas that would be best left unthinned as wildlife cover and for travel corridors.

(G) Preserve all snags. Downed logs with a diameter greater than **10**" will be preserved.

(H) Use prescribed fire and the management of natural ignitions to reduce ground fuels and to reintroduce fire to the ecosystem.

(I) Defer Livestock grazing, after the initial fire treatment to allow for understory recovery and change grazing management to allow for function of natural processes.

(J) Decrease road densities to enhance stand integrity by reclaiming old skid trails and log landings.

14. Issue: Large and Old Tree Retention

Our goal is to restore the forest's ecological integrity, which would include composition, structure and function. We are seeking to restore the natural range of variability with a distribution of tree ages, sizes and spatial structures, but not precise structural conditions that existed at some designated point in time. Reconstructed historic reference conditions should be used as general guides, rather than rigid restoration prescriptions. The Sierra Club and Center for Biological Diversity support a conservative approach, which seeks to determine the minimum amount of mechanical intervention and structural manipulation necessary to restore natural processes such as fire. Restoration is not a single event, but a process that occurs over time.

The Sierra Club and Center for Biological Diversity support a 16" diameter limit for tree cutting. We also support a 16" diameter threshold for exceptions for large tree retention during ecological restoration. The exception-threshold is not a strict diameter limit; rather, it limits the cutting of young trees larger than 16" diameter to circumstances and criteria set forth in exception categories in the 4FRI Large Tree Retention Strategy. In those cases, we support leaving those large, young trees on site to as logs, snags and for soil stabilization.

There is a generally recognized need to retain larger trees and protect old growth in southwestern ponderosa pine forest restoration. Some proponents of large tree retention have suggested that a 16" diameter cap is both ecologically and socio-politically warranted given the scarcity of mature and old growth forest cover in the region; the need to quickly re-establish lost mature and old forest structure; the necessity of retaining trees larger than 16" dbh to recruit new trees into regionally-underrepresented VSS 5, 6 and "old growth" structural stages; and the regional rarity of trees larger than 16" (approximately 96% of ponderosa pine trees in northern Arizona and New Mexico are smaller than 16-inch dbh). Such proponents have proposed diameter caps as a means to (1) prevent large-tree logging for production-oriented, uneven-aged silvicultural goals, (2) discourage large-tree logging to pay for small-tree thinning or other activities, (3) favor small-diameter-specific industries over large-tree-dependent ones, (4) avoid population-level effects to imperiled species and wildlife that are associated with larger live and dead trees and denser canopy, (5) mitigate unforeseen large tree mortality during and following restoration treatments, (6) mitigate unknown rates of future large tree mortality resulting from re-establishing natural fire regimes and future climates, (7) mitigate under-estimates of historical tree densities owing to evidence undercounting and loss to fire, logging and decay, (8) accommodate differing reference scales, choices of reference attributes, restoration objectives and desired degrees of precision or rates of change, (9) mitigate uncertainty about future national forest policy, timber and wildlife habitat management, and (10) facilitate a restoration approach

that reduces immediate crown fire threat while incrementally moving the forest toward its natural range of variability through a combination of thinning and natural fire.

Diameter limits and exception-thresholds for tree cutting are a common strategy for achieving ecological objectives in western forest landscapes. In their recommendations to Congress and the President, the Eastside Forests Scientific Society Panel proposed a 20" diameter limit for trees younger than 150 years old to protect late-successional and old-growth dry forests of eastern Oregon and Washington. They cited the ecological importance and scarcity of large and old trees and the need to retain them to replenish regionally-depleted supplies of large and old trees, snags, logs and associated wildlife habitat. Those recommendations formed the basis for interim management direction amending nine national forest plans and establishing a 21" diameter limit in dry forests which in turn carried forward into an exception-threshold of 21" diameter in legislation proposed to restore dry forests of eastern Oregon. The Sierra Nevada Framework set forth a 20" diameter limit for tree cutting to conserve late-seral forests across national forest land in the Sierra Nevada. Larger diameter limit and exception-thresholds in these examples reflect more productive forests and larger mean diameters than in southwestern forests. Diameter limits in Region 3 forest plans restrict large tree cutting in habitat for Mexican spotted owl and northern goshawk for their viability and in "old growth"; diameter-based "vegetative structural stages" guide management of those species' habitats.

Stems larger than 16" dbh comprise only approximately three percent (3%) of live ponderosa pines in Arizona and New Mexico, according to Forest Inventory and Analysis (FIA) data (USDA 1999, USDA 2007). The same data indicate that more than eighty-two percent (82%) of ponderosa pine trees in Region 3 are currently smaller than 11" dbh; approximately ninety-six percent (96%) of ponderosa pines are smaller than 15-inches dbh; and less than one-tenth of one percent (.01%) of pines are larger than 21" dbh. Large snags, which provide critical wildlife habitat, comprise less than three percent (3%) of total snags on the landscape, and average about one large snag per eight acres (Nowicki and George 2004). Clearly, the size distribution of trees in the southwest is heavily skewed toward small-diameter trees and is dramatically different than historical conditions (Fulé et al. 1997). Given the extreme rarity of large-diameter trees and the overabundance of small trees, trees larger than 16" dbh should generally be retained in ecological restoration treatments (Allen et al. 2002).

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 tree mortality (Hunter 2007), and fire treatments may leave trees susceptible to bark beetle infestation (Wallin et al. 2003). Additionally, large tree mortality has unintentionally resulted from mechanical thinning projects (Hunter 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 2007).

Any gains in new snags and downed logs as a result of vegetation treatments generally do not offset their loss at a landscape scale (Randall-Parker and Miller 2002). Hence, the continued existence of large trees and snags for purposes of old-growth function and adapted ecological processes is by no means assured. Considering their scarcity, as well as the unique services they provide, large trees should be preserved whenever possible. Because large trees are the most difficult of all forest structural elements to replace, logging them constitutes an irreversible environmental impact that is scientifically controversial in regards to its efficacy in fire hazard reduction and forest restoration (Covington 2000, Cortner 2003).

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

Ponderosa pine forests historically contained a percentage of trees that were saplings, poles, and blackjack sized trees. To account for this, a diversity of tree sizes will be retained both within tree groups as well as across the restoration treatment area. Removing all of the smaller trees would result in oversimplification of the forest's structure and distribution of trees by age class. Our goal is to restore a natural range of variability based on soils, slope and aspect.

(A) Utilize and enhance existing forest structure by retaining the largest trees and groups of larger trees with interlocking crowns. Retain co-dominants in the larger diameter groups present on a site to maintain greater canopy retention with the goal of creating groups that function more like pre-disturbance groups. The diameter range of the largest trees existing on a site will vary with past treatments, site location and site productivity.

(B) Larger diameter trees, in VSS 4, 5, and 6 should be retained to replace the structure and function of old growth trees that were removed by logging. This would also apply to the larger trees in smaller structural stages.

(C) When creating openings focus on the removal of small, young trees (12" dbh) from the spaces and openings between groups. According to the USDA, more than 82 percent of ponderosa pine trees in Region Three are smaller than 11 inches in diameter. (USDA, 1999 & 2007) This would reduce ladder fuels, lowering the potential for crown fires. It would also encourage the growth of an understory community.

(D) Thin variably within retained groups, removing ladder fuels and avoiding even spacing. The goal is to emulate old growth group structure.

(E) Openings within and between groups that were created by the logging of presettlement trees, or larger trees established close to disruption of the natural fire regime should not be considered openings to be maintained over time. However, given the high number of these logging created openings, their impacts should be considered when evaluating the creation of new openings. This should apply to all spatial scales.

(F) Identify and retain areas that would be best left unthinned as wildlife cover areas and for travel corridors. Retain trees with nests in them, and surrounding trees providing associated habitat, wind protection or shading.

(G) Preserve all snags. Downed logs with a diameter greater than **10"** should be preserved.

(H) Use prescribed fire and management of natural ignitions to reduce ground fuels and to reintroduce fire to the ecosystem.

(I) Defer livestock grazing after the initial fire treatment to allow for understory recovery and change grazing management to allow for function of natural processes.

(J) Decrease road densities to enhance stand integrity by reclaiming old skid trails and log landings.

Thank you for the opportunity to comment.

Respectfully,

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