CENTER *for* BIOLOGICAL DIVERSITY

January 21, 2014

**SENT VIA EMAIL**

Chief of the Forest Service, Tom Tidwell
Email: objections-chief@fs.fed.us

**Re: Objection to the Final Environmental Impact Statement (FEIS) and Revised Land and Resource Management Plan (Forest Plan) for the Lake Tahoe Basin Management Unit (LTBMU) (Responsible Official, Randy Moore, Regional Forester, Pacific Southwest Region)**

Dear Chief Tidwell:

The Center for Biological Diversity ("Center"), and the John Muir Project of Earth Island Institute ("JMP"), submit the following Objection to the Final Environmental Impact Statement (FEIS) and Revised Land and Resource Management Plan (Forest Plan) for the Lake Tahoe Basin Management Unit (LTBMU).

The Center is a non-profit, public interest, conservation organization dedicated to the protection of native species and their habitats through applying sound science, policy and environmental law. The Center has over 50,000 members, many of whom reside in California and Nevada.

The following Objection, like our previous comments, is offered with the goal of producing a Final Plan that conserves the wildlife of the Forest.

## I. Statement Of The Issues And/Or The Parts Of Plan Revision To Which The Objection Applies

This Objection applies principally to wildlife conservation. To that end, we object to, and suggest changes to, Standards/Guidelines in the following sections of the Forest Plan: a) Forest Vegetation, Fuels, and Fire Management Standards and Guidelines, and b) Biological Resources Standards and Guidelines. Further, the Plan process violates NFMA and NEPA for the reasons described below, such as failure to ensure viability of wildlife, failure to take a "hard look" at impacts to wildlife, failure to adequately respond to comments, and failure to analyze a reasonable range of alternatives. Finally, the Desired Conditions in the Plan reflect a narrow view of the forest and one that would harm, not help, wildlife like spotted owls, bats, martens, and fishers because it would be contrary to their habitat needs as to basal area, snag levels, stand density, and forest structure.

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## II. Concise Statement Explaining The Objection And Suggesting How The Proposed Plan Decision May Be Improved

### A. Standards/Guidelines

We object to the lack of meaningful conservation standards/guidelines for wildlife habitat especially as to a) dense late-seral forest, and b) dense post-fire early-seral forest. As explained below, the Plan can address this in the following ways (additions are provided in underline format and deletions in strikethrough format):

**SG28.** After wildfires and other large-scale natural disturbances, take prompt measures to reduce adverse effects on public safety, water quality, scenic quality, recreation use, wildlife, and forest health. During the planning of postfire restoration projects, reduce forest fuels as needed to meet fuel loading and fire behavior guidelines to provide for public safety. Prioritize objectives and consider ecological restoration utilizing Standards 58 and 59 below. The cost of restoration may be offset by the sale of timber and biomass. [Guideline]

**Change to:** After wildfires and other large-scale natural disturbances, take prompt measures to reduce adverse effects on public safety, water quality, scenic quality, recreation use, wildlife, and forest health. This includes taking prompt measures to protect and conserve post-fire wildlife habitat. ~~During the planning of postfire restoration projects, reduce forest fuels as needed to meet fuel loading and fire behavior guidelines to provide for public safety~~ Prioritize objectives and consider ecological restoration utilizing Standards 58 and 59 below. ~~The cost of restoration may be offset by the sale of timber and biomass~~. [Guideline]

**Reason for edits**: The addition is necessary to make explicit that wildlife measures must include protection of post-fire habitat. The first deleted sentence provides no meaningful guidance and is ambiguous. Moreover, to the extent the sentence is aimed at conducting logging to address fuel loading, no science is provided to support that idea. Furthermore, McGinnis et al. (2010) studied four fire areas in the Sierra Nevada and found that: 1) post-fire logging conducted to reduce fuels and future fire intensity actually increased fuels in the short-term and did not reduce fuels in the long-term; 2) post-fire logging, artificial conifer planting and herbicide spraying increased the spread and occurrence of highly combustible noxious/invasive weeds, and did not effectively reduce future fire intensity, with 92% tree mortality predicted in subsequent fire (more than two decades postfire-logging/planting/spraying) in high fire weather, and 87% mortality predicted even in low fire weather (Table 6). The authors noted that, because the postfire-logging/planting/spraying scenario greatly increases pyrogenic invasive weeds, which tend to increase fire frequency and intensity (especially in areas with active human presence in terms of recreation, hunting, and tree cutting, which can provide sources of ignition), each successive fire would be likely to increase invasive weeds more, and thus increase fire intensity more, and so on, thus undermining goals of reestablishing mature conifer forest.

The second sentence is deleted because it further creates a conflict of interest in which logging can be promoted in order to achieve funds. This should never be the case and therefore this incentive should be eliminated.

**SG23.** In conifer forest types, design fuel reduction treatments so that post treatment fuels conditions will not sustain crown fire. [Guideline]

**Change to:** In conifer forest types, in areas where crown fire is not desired (e.g., human structure protection), design fuel reduction treatments so that post treatment fuels conditions will not sustain crown fire. [Guideline]

> **Reason for edits**: It should be more explicit as to where crown fire is not desired. There will be areas where crown fire is desired, and this should be reflected.

**SG31.** When creating openings to restore forest structure/forest health use the group selection with reserve prescription within the mid seral stage. Openings shall range in size from less than 1 acre to 10 acres. Openings shall vary in size and shape and retain trees (singly and in clumps) to produce spatial and structural heterogeneity typical of early seral habitats. On a landscape basis, the majority of openings would be less than 5 acres. Shape and blend the edges of openings to the extent practicable with the natural terrain. [Guideline]

**Change to:** When ~~creating openings to restore forest structure/forest health use~~ using the group selection with reserve prescription within the mid seral stage, openings shall ~~range in size from~~ be less than 1 acre to ~~10~~ 2 acres. Openings shall vary in size and shape and retain trees (singly and in clumps) to produce spatial and structural heterogeneity, and medium/large felled trees will be retained on site to provide large downed log habitat, or trees will be girdled to create standing snags to facilitate such openings, while providing habitat for woodpeckers and other cavity-nesting species. ~~typical of early seral habitats~~. ~~On a landscape basis, the majority of openings would be less than 5 acres. Shape and blend the edges of openings to the extent practicable with the natural terrain.~~ [Guideline]

> **Reason for edits**: We do not support group selection because it does not mimic ecological processes and does not mimic or create early-seral habitat (e.g., Swanson et al. 2011). To the extent it is included, the Sierra Nevada Ecosystem Project Report[1] found that openings should be less than 1-2 acres in size and should include retention within them. Retention of trees as snags or downed logs will create habitat for wildlife.

**SG33.** Retain trees 30 inches dbh or larger. Where trees greater than 30 inches DBH need to be removed, ID Team members (e.g., vegetation management specialist, wildlife biologist, scenic specialist, recreation management specialist) will propose trees to be removed, girdled for snag creation, or felled for coarse woody debris during project development. Exceptions under which a tree 30 inches dbh or larger can be removed include the following: [Standard]

**a)** The tree(s) larger than 30 inches dbh presents a safety hazard, or prevents equipment operability.

**b)** The tree(s) larger than 30 inches dbh is a host/source of insects or disease or where stands are at a high risk of beetle outbreak and/or disease transmission

[1] http://ceres.ca.gov/snep/pubs/v2s3.html

**c)** The preponderance of overstory trees within the stand are greater than 30 inches dbh and at high densities, the selection for removal or snag creation would allow competitive release for growth of the largest trees
**d)** Shade tolerant trees larger than 30 inches dbh are increasing the rate of mortality or out-competing preferred species
**e)** When necessary to support aspen, meadow or stream restoration
**f)** When managing for blister rust resistant sugar pines that require removal of competing trees within a sufficient radius to improve health of the sugar pine.

**Change to:** Retain trees 20 ~~30~~ inches dbh or larger. Where trees greater than 20 ~~30~~ inches DBH need to be cut ~~removed~~, ID Team members (e.g., vegetation management specialist, wildlife biologist, scenic specialist, recreation management specialist) will propose trees to be removed, girdled for snag creation, or felled for coarse woody debris during project development. Exceptions under which a tree 20 ~~30~~ inches dbh or larger can be cut ~~removed~~ include the following: [Standard]
**a)** The tree(s) larger than 20 ~~30~~ inches dbh presents a safety hazard, ~~or prevents equipment operability~~.
**b)** ~~The tree(s) larger than 30 inches dbh is a host/source of insects or disease or where stands are at a high risk of beetle outbreak and/or disease transmission~~
**c)** ~~The preponderance of overstory trees within the stand are greater than 30 inches dbh and at high densities, the selection for removal or snag creation would allow competitive release for growth of the largest trees~~
**d)** ~~Shade tolerant trees larger than 30 inches dbh are increasing the rate of mortality or out-competing preferred species~~
**e)** ~~When necessary to support aspen, meadow or stream restoration~~
**f)** ~~When managing for blister rust resistant sugar pines that require removal of competing trees within a sufficient radius to improve health of the sugar pine~~.

**Reason for edits**: The addition is necessary to more clearly allow for snag creation and CWD creation. None of the deleted exceptions are justified, and they would swallow the rule. For example, trees with insects or disease are ubiquitous on the landscape (all trees have native insects) and could nonetheless be logged under this exception. Similarly, the preponderance of overstory trees will very often be greater than 20 inches dbh and at high densities, and shade tolerant trees are often outcompeting other species. Moreover, aspen restoration can occur without the destruction and removal of large old trees.

**SG37.** In late seral closed canopy stands (greater than 50 percent canopy closure), treatments shall not reduce canopy cover in dominant and co-dominant trees by more than 10% across a stand, or below the desired conditions for the area. [Standard]

**Change to:** ~~In late seral closed canopy stands (greater than 50 percent canopy closure), treatments shall not reduce canopy cover in dominant and co-dominant trees by more than 10% across a stand, or below the desired conditions for the area. [Standard]~~

**Reason for edits**: This standard is unhelpful. SG38 provides the necessary guidance.

**SG38.** Retain current late seral-closed canopy (greater than 50 percent canopy closure) stands and when considering thinning of these stands, retain this seral stage as closed canopy outside of the WUI. Within the WUI, retain this seral stage as closed canopy if fire behavior objectives can be met. [Standard]

**Change to:** Retain current late seral-closed canopy (greater than 50 percent canopy closure) stands and when considering thinning of these stands, retain this seral stage as closed canopy outside of the WUI Defense. Do not reduce canopy cover by more than 10%. Within the WUI Defense, retain this seral stage as closed canopy if fire behavior objectives can be met. [Standard]

> **Reason for edits**: Late seral-closed canopy forest is essential to many wildlife species including owls, martens, bats, and woodpeckers. Therefore, it is necessary to protect this habitat unless there are very narrow justifications. Here, much area falls into the WUI, and therefore that exception would swallow the rule to a great degree and would provide almost no benefit to homes and structures because the benefit to those occurs in the WUI Defense. The scientific data on this issue are clear that: a) the only effective way to protect homes is to thin small trees and brush (and limb up larger trees) within 30-40 meters of individual homes and to encourage fire-proofing steps for the homes themselves (Cohen 2000, Cohen and Stratton 2008, Gibbons et al. 2012); b) most homes are burned by lower-intensity wildland fire, not crown fire (Cohen 2000, Cohen and Stratton 2008); c) non-commercial/pre-commercial thinning of small trees alone (trees less than 10 inches in diameter) effectively reduces potential fire severity and fire rate of spread, even where high levels of forest basal area are retained (Martinson and Omi 2003, Strom and Fule 2007); and d) this effect of small-diameter tree thinning is effective in reducing crown fire to low-intensity surface fire over a very short distance—less than 50 meters generally and almost always in less than 70 meters (Skinner et al. 2005, Safford et al. 2012). This data indicates that buffer zones, such as the "Threat Zone", which extends nearly two kilometers from homes is misleading in that it is not consistent with the current science regarding home protection and, in fact, may put homes at greater risk by diverting scarce resources to "fuels reduction" projects located much too far from homes to effectively protect them, and by giving homeowners a false sense of security that their homes have somehow been protected by such projects. The data indicate that the only effective, or at least the most effective, way to protect homes is to conduct small-tree thinning within less than 100 meters of individual homes, and to educate, and assist, homeowners regarding how they can protect their structures. This approach is simply missing in the Plan.

**SG58.** Postfire restoration projects (as planned using Guideline number 28 above) shall give priority to public safety and developed infrastructure first (e.g. hazard tree mitigation, WUI hazardous fuel reduction, flooding, roads, and trails, etc.) and then to wildlife habitat (including retention of burned forest habitat), soils, vegetation, water quality, and invasive species. [Standard]

**Change to:** Postfire restoration projects (as planned using Guideline number 28 above) shall give priority to public safety and developed infrastructure first (e.g. hazard tree mitigation, ~~WUI hazardous fuel reduction,~~ flooding, roads, and trails, etc.) and then to wildlife habitat (~~including~~ especially retention of burned forest habitat [ e.g., for Black-backed Woodpecker]), soils, vegetation, water quality, and invasive species. [Standard]

> **Reason for edits**: No justification is provided for post-fire "WUI hazardous fuel reduction", and, as already explained above, it would allow extensive logging with little or no benefit. In addition, wildlife habitat protection should be more clear about the importance of retention of burned forest habitat, and the Forest Service should refer specifically to the black-backed woodpecker, especially in light of the Conservation Strategy that exists for this species.

**SG59.** Ensure that postfire restoration projects (as planned using Guideline number 28 above) include ecological restoration objectives based on needs of local wildlife species that use burned forest habitat. Include site-specific considerations such as burned forest habitat patch size and connectivity, snag spatial arrangement and density, range of snag sizes and densities, and focal placement of snags. [Standard]

**Change to:** Ensure that postfire restoration projects (as planned using Guideline number 28 above) ~~include~~ emphasize and promote ecological restoration objectives based on needs of local wildlife species that use burned forest habitat (e.g., black-backed woodpecker). Include site-specific considerations such as burned forest habitat patch size and connectivity, snag spatial arrangement and density, range of snag sizes and densities, and focal placement of snags. [Standard]

> **Reason for edits**: It is important to refer to species that require the highest snag densities to ensure that those species' requirements are met. The black-backed woodpecker is the most snag dependent avian species and it is therefore important to make specific reference to it. As explained in our comments:
>
> > The best available science shows that nearly 100% of post-fire habitat should be retained to protect habitat. Hanson and North 2008 found that "Black-backed Woodpecker foraged exclusively in high severity and unlogged patches." Saracco et al 2011 urged caution as well noting that its study "suggests that salvage logging following wildfire may not just negatively affect short-term responses of woodpeckers and other wildlife (Koivula and Schmiegelow 2007, Hanson and North 2008), but it may have particularly strong negative effects on the longevity of fire areas as habitat for these species."
> >
> > Moreover, there is no ecological justification for post-fire salvage logging and therefore it should not occur except for public safety reasons. As noted in Hutto 2006, "Toward Meaningful Snag-Management Guidelines for Postfire Salvage Logging in North American Conifer Forests": "the only way to mimic natural snag densities for harvests that seek to mimic the very earliest stage of succession

(immediately after a fire) would be to leave close to the same number of burned trees per unit area that would occur through a stand-replacement disturbance event. The numbers of standing dead trees per hectare immediately following stand-replacement fire number in the hundreds, of course (Everett et al. 1999), so snag guidelines should recommend perhaps 50 times the number currently recommended in the most commonly used guidelines. On top of that, the densities of snags in patches used by birds for cavity nesting (Harris 1982; Saab and Dudley 1998) and feeding (Kreisel & Stein 1999) are significantly higher than what is randomly available in early postfire forests, so if guidelines were built on "average" snag densities associated with recently burned forests, they might still fall short of the densities actually needed by these birds. I hasten to add that I am only scratching the surface of this issue by concentrating my attention on the needs of birds. Even more stringent guidelines might follow from a consideration of the needs of snag-dependent, pyrophilous insects and spiders, for example (Nappi et al. 2004)."

Also, the statement that "the distribution of black-backed woodpecker populations in the Sierra Nevada is stable" is unhelpful for assessing the conservation of the species. A species can be well distributed in an area but nonetheless be at severe risk of extinction. Moreover, given that black-backed woodpeckers have an extremely close affinity with post-fire habitat, specifically high-severity post-fire habitat, the best and only way to protect the species is to adopt standards that ensure the protection of post-fire habitat, especially mid to high severity post-fire habitat. And the only way to effectively do that is to protect all post-fire habitat.

**SG62.** Manage snag levels during project specific analysis after consideration for public safety. Prioritize retention of medium- and large-diameter snags or live trees that exhibit form and/or decay characteristics regarded as important wildlife habitat (e.g., have substantial wood defect, teakettle branches, broken tops, large cavities in the bole, etc.). Retain snags as follows: [Guideline] **a)** Red fir forest type and white fir-mixed conifer forest types – on average, strategically locate and retain six of the largest snags per acre (In the WUI, fewer snags may be retained.) **b)** Jeffrey pine – on average, strategically locate and retain three of the largest snags per acre (In the WUI, fewer snags may be retained.) **c)** Snags should be clumped and distributed irregularly across treatment units. **d)** Snags with cavities are a priority for primary and secondary cavity nesters (e.g., mountain bluebirds, house wrens, and white breasted nuthatch). When snags are absent consider installation of nest boxes to benefit cavity nesters. **e**) Consider multiple resource values to determine appropriate retention levels based on availability and project objectives.

**Change to:** Manage snag levels during project specific analysis after consideration for public safety. For projects not associated with post-fire burned forest habitat, prioritize retention of medium- and large-diameter snags or live trees that exhibit form and/or decay characteristics regarded as important wildlife habitat (e.g., have substantial wood defect, teakettle branches, broken tops, large cavities in the bole, etc.). Retain snags as follows: [Guideline] **a)** Red fir forest type and white fir-mixed conifer forest types – ~~on average, strategically locate and~~ retain ~~six~~ all of the largest snags per acre (~~In the WUI, fewer snags may be retained.)~~ **b)** Jeffrey pine – ~~on average, strategically locate and~~ retain ~~three~~ all of the largest snags per acre ~~(In the WUI, fewer snags may be retained.)~~ **c)** ~~Snags should be clumped and distributed irregularly across treatment units~~. **d)** Snags with cavities are a priority for primary and secondary cavity nesters (e.g., mountain bluebirds, house wrens, and white breasted nuthatch). When snags are absent consider installation of nest boxes to benefit cavity nesters. **e**) Consider multiple resource values to determine appropriate retention levels based on availability and project objectives.

> **Reason for edits**: Snags are one of the most important habitat features on the landscape and should be retained unless absolutely necessary to cur for human safety reasons. There is no basis to limit snags to 6 per acre or 3 per acre, especially in light of the wildlife literature showing species preference for areas with high snag levels. Moreover, there is no justification for greater removal of snags in the WUI. For example, Barbour et al. (2002) found that reference forests in the Lake Tahoe Basin had an average of 16 snags per acre over 16 inches in diameter at breast height—and Verner et al. (1992) recommended that at least 8 large snags per acre exist to support suitable California spotted owl foraging habitat, and higher levels of large snags for nesting and roosting. Yet the Draft Plan does not provide for such snag protection in spotted owl habitat thus further undermining the species' viability.
>
> Further, it should be made explicit that this does not apply to post-fire situations, which have very different snag requirements.

**SG86.** Maintain PACs and HRCAs that have been occupied by California spotted owl or northern goshawk within the last 10 years. However, after a stand-replacing event, evaluate habitat conditions within a 1.5 mile radius around the activity center to identify opportunities for re-mapping the PAC. If a California spotted owl PAC is remapped, the corresponding HRCA should be remapped within 1.5 miles of the remapped spotted owl PAC. If there is insufficient suitable habitat for designating a PAC within the 1.5 mile radius, the PAC and corresponding HRCA may be removed from the network. [Standard]

**Change to:** Maintain PACs and HRCAs that have been occupied by California spotted owl or northern goshawk within the last 10 years. ~~However, after a stand-replacing event, evaluate habitat conditions within a 1.5 mile radius around the activity center to identify opportunities for re-mapping the PAC. If a California spotted owl PAC is remapped, the corresponding HRCA should be remapped within 1.5 miles of the remapped spotted owl PAC. If there is insufficient suitable habitat for designating a PAC within the 1.5 mile radius, the PAC and corresponding HRCA may be removed from the network.~~ Avoid re-drawing PACs or HRCAs to exclude high intensity burns and do not "retire" PACs until and unless at least three years of surveys to protocol confirm non-occupancy. [Standard]

> **Reason for edits**: This Standard fails to incorporate the most recent science regarding California spotted owls in the Sierras (see, e.g., Lee et al. 2012; Bond et al. 2009). There is no justification for the Forest Service to fail to incorporate high-intensity burned areas as part of PACs and HRCAs or to automatically redraw PACs to exclude high-intensity

burned forests. This is especially true given that the Forest Service can abuse this Standard to redraw a PAC post-fire and then declare that salvage logging will not occur in the PAC. As demonstrated by the recent research, areas with high intensity effects, along with other types of fire effects, are utilized by owls for foraging and nesting and must be considered to be suitable habitat. The Forest Service should avoid re-drawing PACs or HRCAs to exclude high intensity burns and must not "retire" PACs until and unless at least three years of surveys to protocol confirm non-occupancy. It is imperative that the Forest Service not continue to make the mistake of wrongfully assuming that intensely burned forest is no longer suitable owl habitat.

**SG88.** Where canopy cover in PACs and HRCAs exceeds desired conditions, maintain current cover unless reduction would improve habitat conditions to meet life history needs of the species or reduce the risk of stand-replacing wildfire. Retain canopy cover to maintain at or above a minimum of 50% in PACs and 40% in HRCAs, except where less is needed to achieve standard and guide for restoration of PACs/HRCAs. [Guideline]

**Change to:** ~~Where canopy cover~~ In PACs and HRCAs ~~exceeds desired conditions~~, maintain current cover ~~unless reduction would improve habitat conditions~~ to meet life history needs of the species ~~or reduce the risk of stand-replacing wildfire~~. ~~Retain canopy cover to maintain at or above a minimum of 50% in PACs and 40% in HRCAs, except where less is needed to achieve standard and guide for restoration of PACs/HRCAs~~. [Guideline]

**Reason for edits**: This Guideline would allow the Forest Service to log important dense forest habitat under the generic and wrong assumption that it needs to be protected from fire. In fact, the best available science shows that pre-fire and post-fire dense forest habitat should be maintained and protected as is for wildlife (see, e.g., Lee et al. 2012; Bond et al. 2009; Siegel et al. 2013; Buchalski et al. 2013).

The Guideline as currently written is not scientifically supportable and will not ensure that the viability of this species will be maintained. For example, in Seamans and Gutiérrez (2007), they "found that the amount of mature conifer forest [coniferous forest with >70% canopy cover dominated by medium [30.4–60.9 cm dbh] and large [>60.9 cm dbh] trees] was correlated with Spotted Owl habitat choice. Territories with more mature conifer forest had a higher probability of being colonized and a lower probability of becoming unoccupied." In his 2005 dissertation, Seamans likewise explained that "[n]est sites of spotted owls on my study area were typically associated with forests comprised of large trees (>53 cm diameter at breast height [dbh]) and high canopy cover (>70%) at a micro-site scale (Bias and Gutiérrez 1992, Moen and Gutiérrez 1997, Bond et al. 2004)." He also noted that "[i]t is not known if habitat comprised of large conifers (>60.9 cm dbh) having canopy closure <70% (AMT6) might be positively related to spotted owls demographic rates in the Sierra Nevada," and that "[w]hether this habitat type is positively or negatively related to population parameters is important because treatments proposed in the 2004 Forest Service Management Plan to reduce the spread of wildfire (U.S. Forest Service 2004) will likely convert many patches . . . into this habitat type." Seamans concluded that his results "indicate intensive thinning of forest patches within owl territories that results in a lowering of canopy cover may have negative impacts on survival, and may impact occupancy of territories." Consequently, a standard that protects dense closed canopy forest habitat from logging is necessary to ensure viability of the owl.

**SG90.** Allow vegetation treatments in PACs for the purposes of PAC restoration when both of the following conditions apply: **a)** Surveys for the target species conducted to meet Region 5 protocol demonstrate that reproduction has not occurred within the PAC in at least the previous three years; **b)** The PAC is not currently occupied; and either **i.** Desired conditions within the PAC are not being met and conducting treatments would achieve the desired conditions or shorten the time until those conditions would be expected to occur; or **ii.** Desired conditions are currently met but vegetation treatments are required to maintain desired conditions over the next 15 years. [Standard]

**Change to:** ~~Allow vegetation treatments in PACs for the purposes of PAC restoration when both of the following conditions apply: **a)** Surveys for the target species conducted to meet Region 5 protocol demonstrate that reproduction has not occurred within the PAC in at least the previous three years; **b)** The PAC is not currently occupied; and either **i.** Desired conditions within the PAC are not being met and conducting treatments would achieve the desired conditions or shorten the time until those conditions would be expected to occur; or **ii.** Desired conditions are currently met but vegetation treatments are required to maintain desired conditions over the next 15 years. [Standard]~~

> **Reason for edits**: This Standard should be eliminated because it would allow important habitat to be reduced in density and structure when the best available science shows that owls need and prefer dense, complex, forest.

**SG91.** Allow vegetation treatments in PACs To address wildland fire risk within the Wildland Urban Interface (WUI): **a)** In the Defense Zone, where an unacceptable risk to communities is demonstrated at the stand level (e.g., when wildland fire behavior models predict crown fires); Or **b)** In the Threat Zone, where the overall landscape level fire and fuels strategy would be ineffective. [Standard]

**Change to:** Allow vegetation treatments in PACs-To address wildland fire risk within~~ the Wildland Urban Interface (WUI): **a)** In ~~the Defense Zone, where an unacceptable risk to communities is demonstrated ~~at the stand level (e.g., when wildland fire behavior models predict crown fires); Or **b)** In the Threat Zone, where the overall landscape level fire and fuels strategy would be ineffective. [Standard]~~

> **Reason for edits**: This Standard should be eliminated as to the Threat Zone because it would allow important habitat to be reduced in density and structure when the best available science shows that owls need and prefer dense, complex, forest. Moreover, the Threat Zone exception would cover an extremely broad area but is not supportable.

**SG92.** Allow vegetation treatments in PACs to reduce threats (e.g. pathogens, insects, disease and/or stand-replacing wildfire) to the persistence of forested stands in or adjacent to PACs. [Standard]

**Change to:** ~~Allow vegetation treatments in PACs to reduce threats (e.g. pathogens, insects, disease and/or stand-replacing wildfire) to the persistence of forested stands in or adjacent to PACs. [Standard]~~

> **Reason for edits**: This Standard should be eliminated because it would allow important habitat to be reduced in density and structure when the best available science shows that owls need and prefer dense, complex, forest. Moreover, the exemption makes no sense ecologically.

We also request the following additions for Standards/Guidelines to protect wildlife habitat:

- Require retention, through a forest-wide standard (not a guideline), of at least 90% of any moderate/high-severity burn areas (except for public safety reasons—i.e., hazard trees that could hit public roads or buildings) which are created by fire, wildland or otherwise, outside of the Defense Zone, and retain the maximum possible amount of such habitat that can be retained in the Defense Zone while ensuring protection of homes.

- Add a forest-wide standard (not a guideline) requiring the Forest Service to maintain at least viable populations of all MIS on the LTBMU planning area.

- Include a standard for a limited operating period (LOP) for moderate and high severity burn areas which prohibits logging during the nesting season to protect the multitude of nesting birds, including Black-backed Woodpeckers and their offspring, until the chicks can survive independent of the parents (April through August).

- Include a standard that states that while prescribed fire would have less than 20% mortality in the Defense Zone, it could and should sometimes have higher levels of tree mortality outside of the Defense Zone in order to provide habitat for Black-backed Woodpeckers and other post-fire associates. The Forest Service should be actively managing for this extremely important, rare and highly bio-diverse habitat type.

- Add a standard that, within any 5-year period, at least 4,000 acres of suitable Black-backed Woodpecker habitat would be maintained on the LTBMU, through a combination of managed wildfire, mixed-intensity prescribed fire, and active snag creation. This does not mean that, within every 5-year period, 4,000 acres would have to experience near-complete tree mortality from fire; rather, it means that the Forest Service would not allow the amount of suitable Black-backed Woodpecker habitat on the LTBMU to sink below 4,000 acres in any 5-year period. Black-backeds can often use post-fire habitat of good quality for 10 years post-fire, and they also use areas of 40-50% tree mortality, if pre-fire basal area density is fairly high.

- Incorporate, as forest-wide standards, requirements to retain, in all current suitable Spotted Owl *nesting and roosting habitat* as defined in USDA (2001b [Volume 3, Table 4.4.2.1c]), at least 185-350 square feet per acre of live tree basal area, at least 20-30 square feet per acre of basal area in snags over 15 inches in diameter, and at least 70% canopy cover, consistent with the description of suitable habitat in the scientific literature (Verner et al. 1992, USDA 2001b [Vol. 3, Table 4.4.2.1c], Bond et al. 2004, Irwin et al. 2007).

- Incorporate as a forest-wide standard a limit on reducing more than 10% of the live tree basal area through forest management in nesting and roosting habitat, in order to avoid degrading high quality nesting/roosting habitat to minimally adequate habitat, and to prevent loss of occupancy (Seamans and Gutierrez 2007).

- Add forest-wide standards and guidelines allowing and encouraging active snag creation in forest areas that otherwise meet the above definition of suitable California Spotted Owl nesting and roosting habitat but are deficient with regard to large snag basal area.

### B. The FEIS Fails to Meaningfully Respond to Comments and to Address Science Contrary to the Forest Service's Assumptions

We object to the Response to Comments. For example, the following statements in the Response to Comments are inaccurate and are addressed after each quoted or paraphrased response:

**a.** "Standards and Guidelines in the plan ensure that resources, such as vegetation, Recreation, Minerals, Water, Soils, Cultural and Historic, and Fish and Wildlife are protected."

Currently, this is not accurate in light of the comments above as to the Standards/Guidelines.

**b.** "Species viability was not identified as a new issue, trend or management concern which would change from those identified in the 1988 Forest Plan. We do however, believe that the Forest Plan provides for species viability as is required in the regulations. Maintaining species viability, like other concepts within the 1982 regulations, is a background principle and guiding force that influences all alternatives, even though they are not specifically called out in the Purpose and Need. It is unnecessary and would be impractical to include every regulatory concept in the 1982 rules as part of the Purpose and Need."

This justification for not explicitly including viability as a requirement is flawed. Viability is one of, if not the, most important issues at stake and can therefore not be lumped into a generic claim that "[i]t is unnecessary and would be impractical to include every regulatory concept in the 1982 rules." That is simply a non-answer and is irrelevant. Likewise, simply because viability is not "new" is *not* a good reason not to include it in explicit and clear fashion. The 1982 regulations require forest plans to maintain viable populations of wildlife. Either the LTBMU plan does this, though fails to clearly state this fact, or it does not include this requirement, in which case it violates the 1982 regulations.

**c.** **"**If the LTBMU continues to be deficient in early seral, we would create more until the balance described in the desired conditions is achieved."

This claim is contradicted by two factors. First, early seral forest cannot be mimicked by logging because logging cannot create dense post-disturbance snag levels for example (e.g., Swanson et al. 2011). Second, the Plan states that it will not conduct prescribed fire to achieve high-severity effects and therefore the Forest Service will be unable to create early seral forest via prescribed fire.

**d.** **"**Given the extensiveness of overly dense forest conditions, and the objectives for scenic quality in the Basin, beetle outbreaks and the tremendous tree mortality associated with them are not acceptable. Therefore, thinning the forest stands below maximum stand density index for each of the major forest types on a periodic basis will lower the risk of outbreaks and improve resiliency of the stands to withstand natural levels of beetle attack."

This statement assumes too much. First, there is nothing un-scenic about mortality from beetles and many people can enjoy such areas, especially once they understand the importance, ecologically, of such areas. And, to claim that the mortality associated with beetles is not acceptable reflects a bias towards silvicultural objectives when the Forest Service is also tasked with maintaining the ecological integrity of the area. No meaningful argument has been presented to show that beetle mortality is unacceptable and to the contrary, such mortality creates important wildlife habitat.

**e.** "Sierra Nevada where the fire severity proportions are increasing. Miller et al. (2009) analyzed all of the data that were available at the time of analysis. More recently, Miller and Safford (2012) repeated the analysis for yellow pine, mixed conifer and red fir forests (which are most of the Sierra Nevada), using imagery covering 98% of all fire area and extending the analysis by four years. They found the same trends as Miller et al. (2009)."

A recent study published in September 2013 in the *International Journal of Wildland Fire* found that there is not a trend toward increased fire intensity in the Sierra Nevada (Hanson and Odion 2013.) The study is the first to include all of the available fire data for the Sierra Nevada, and recommends shifting Sierra fire management away from a focus on reducing extent or severity of fire in wildlands, and to instead focus on protecting human communities from fire. Hanson and Odion (2013) conducted the first comprehensive assessment of fire intensity since 1984 in the Sierra Nevada using 100% of available fire intensity data, and using Mann-Kendall trend tests (a common approach for environmental time series data – one which has similar or greater statistical power than parametric analyses when using non-parametric data sets, such as fire data). They found no increasing trend in terms of high-intensity fire proportion, area, mean patch size, or maximum patch size. Hanson and Odion checked for serial autocorrelation in the data, and found none, and used pre-1984 vegetation data (1977 Cal Veg) in order to completely include any conifer forest experiencing high-intensity fire in all time periods since 1984 (the accuracy of this data at the forest strata scale used in the analysis was 85-88%). Hanson and Odion also checked the results of Miller et al. (2009) and Miller and Safford (2012) for bias, due to the use of vegetation layers that post-date the fires being analyzed in those studies. Hanson and Odion found that there is a statistically significant bias in both studies ($p = 0.025$ and $p = 0.021$, respectively), the effect of which is to exclude relatively more conifer forest experiencing high-intensity fire in the earlier years of the time series, thus creating the false appearance of an increasing trend in fire severity. Miller et al. (2012a), acknowledged the potential bias that can result from using a vegetation classification data set that post-dates the time series. In that study, conducted in the Klamath region of California, Miller et al. used a vegetation layer that preceded the time series, and found no trend of increasing fire severity. Miller et al. (2009) and Miller and Safford (2012) did not, however, follow this same approach. Hanson and Odion also found that the regional fire severity data set used by Miller et al. (2009) and Miller and Safford (2012) disproportionately excluded fires in the earlier years of the time series, relative to the standard national fire severity data set (www.mtbs.gov) used in other fire severity trend studies, resulting in an additional bias which created, once again, the inaccurate appearance of relatively less high-severity fire in the earlier years, and relatively more in more recent years.

**f.** "Krawchuk, Gonzalez, and Liu are all global trend scale analyses. The scales of these analyses make application to Forest or Regional scale difficult."

These studies are not difficult to apply. Further, Krawchuck shows clearly that there will be no increase or a decreased fire potential in 5 out of 6 scenarios. The area of increase is east of the Sierra Nevada, in the Great Basin, as seen by running a line up the Gulf of California (such a line goes right through the Sierra Nevada); it does not in any way project an increase in fire potential in the LTBMU. Gonzalez et al., Fig 2c, shows decreased fire; Liu projects increasing drought across southeast California, but shows the Sierra Nevada to be otherwise. Finally, Mckenzie et al. (2004) explicitly modeled summer precipitation (and projected an increase) and did not ignore California's Mediterranean climate -- that is precisely what Mackenzie et al. deals with.

**g.** "Working under the conservative assumption that all of this land is in the appropriate seral stage for Black-backed woodpecker prior to burning, all of this land would have been consumed by moderate to high severity fire within 75 years if 4,000 acres were burned every 5 years."

This response misrepresents our point. We are not asking that 4000 acres be burned at near-total mortality levels every 5 years, but merely that there exist at least 4000 acres of burned forest habitat within a 5 year period. For example, burning could happen every 10 years, and it does not need to be 100% mortality (it can include areas with only 40-50% mortality). Again, the point is simply that there exist the acreage available for the woodpeckers to use during the 5 year period, not that 4000 acres of high-severity fire occur every 5 years.

**h.** **"**As an MIS, the Black-backed woodpecker represents a suite of species that use snags in burned forest habitat. The Black-backed woodpecker is not federally listed or a Forest Service Species of concern. Therefore, we do not think it is appropriate to assign species-specific protection measures, including a Limited Operating Period (LOP), for a species that is representative of a larger group (and a habitat component) and is not federally listed."

This claim does not make sense in light of the fact that a) a Conservation Strategy exists that was issued in collaboration with the Forest Service and which specifically states that logging must not occur during the nesting season, and b) the lack of an LOP will result in the direct death of woodpecker chicks that cannot fly during the nesting season. Moreover, the requirement that a species be federally listed or be formal Species of concern should be eliminated because it results in unintended outcomes such as this one where the Forest Service concludes that deaths to woodpecker chicks are acceptable when in fact they are not. Moreover, final Species of Conservation Concern lists have not been made yet, so the mention of this is irrelevant.

The Plan's failure to incorporate the Black-backed Woodpecker Conservation Strategy with regard to logging in nesting season is also of particular concern because it creates an ecological trap scenario (post-fire habitat attracts breeding Black-backed Woodpeckers, whose chicks could be subject to mortality from post-fire logging in nesting season). This effect compounds adverse impacts of post-fire logging on already imperiled Black-backed Woodpecker populations. Post-fire logging of occupied nest sites during nesting season results in the direct killing of chicks that have not yet fledged (chicks that are not mature enough yet to fly away). This is a serious adverse impact that would unnecessarily create significant risks for the viability of Black-backed Woodpecker populations in the Sierra Nevada.

**i.** The FEIS cites Taylor et al. (2013) (published as Taylor et al. 2014) for the proposition that current forests have become more dense than they were historically. However, Taylor et al. (2014) avoids post-fire habitat areas, from fires in recent decades, through site selection of plots. So, the study does not make a fair or even comparison. Also, Taylor et al. (2014) use modeling assumptions to conclude that current fires will burn more severely, and then suggest, as a remedy, that thinning be used to remove many trees – but they do not address high-severity fire rotation interval, or the fact that the high-severity fire rotation interval in the Tahoe Basin forests is well over 1000 years currently – a deficit from any reasonable, ecological and biodiversity standpoint. Yet their recommendations would further exacerbate the deficit.

### C. The Forest Plan Violates NFMA Because It Does Not Ensure Viable Populations of Fish and Wildlife, and the FEIS Violates NEPA Because It Does Not Adequately Address the Plan's Environmental Consequences or Take a "Hard Look" at Wildlife Impacts

We object to the Plan and FEIS because they do not comport with NFMA and NEPA as to wildlife viability, environmental consequences of the action, and the mandate to take a "hard look" at the Plan's impacts.

While the Response to Comments acknowledges that the Forest service must maintain viable populations of wildlife, it essentially ends the discussion there and does not explain how it will actually achieve that requirement. In the regulations, "viable population" is explicitly defined as a population that has the estimated numbers and distribution of reproductive individuals to ensure its continued existence is well distributed in the planning area. 36 C.F.R. 219.19. "In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area." *Id.*

The EIS does not adequately address the "environmental consequences" of the action. The Plan does not provide a rational conclusion that there exist sufficient standards and guidelines to ensure and maintain viable populations of species, including specifically the black-backed woodpecker, California spotted owl, and marten. For example, the beast available wildlife science shows that wildlife *selects for* both dense unburned areas (especially with high snag levels) as well as dense, intensely burned areas. Spotted owls, martens, and black-backed woodpeckers select for both of these type of areas (e.g., Bond et al. 2009, Bond et al. 2012, Burnett et al. 2012, Lee et al. 2012, Siegel et al. 2013). Moreover, as explained by Forest Service biologists (Manley and Tarbill 2012):

> Woodpeckers play an important role in post-fire habitats by rapidly colonizing burned areas and creating cavities that are used by many other species that rely upon them for nesting, denning, roosting, and resting…. The results from this research indicate that management plans that incorporate habitat for multiple woodpecker species would maintain the greatest biodiversity.
>
> Species of woodpeckers select habitat based on excavation ability and foraging preferences. Species with weaker excavation ability, like White-headed Woodpeckers, will rely more heavily on more decayed snags and live trees for nuts than species with strong excavation ability, like Black-backed Woodpeckers. By understanding the habitat components that are most important for nest site selection, managers may conserve habitat that is preferable for a particular species of woodpecker that may in turn, increase the biodiversity of secondary cavity users. Management that removes most or all small diameter snags from burned areas will reduce the amount of suitable habitat for all three species of woodpeckers, resulting in a reduced density and availability of excavated cavities. Because woodpeckers may act as keystone species (Lawton and Jones, 1995; Martin and Eadie, 1999; Bonar,

2000; Bednarz et al., 2004), loss or degradation of habitat for woodpeckers may influence the structure and composition of cavity-dependent communities. In areas that have been disturbed, such as burned forests, the presence and abundance of certain keystone species can influence the progression of succession by accelerating colonization of some species or altering species composition. Understanding the relationships between woodpeckers, cavity-dependent communities, and habitat is crucial for forest management and conservation.

All three species of woodpecker supported the cavity-dependent community in the burned area, with White-headed and Black-backed Woodpeckers exerting the strongest influence based on the richness and diversity of secondary cavity users. While cavities of Hairy Woodpeckers supported fewer species and were used in lower proportion compared to the other two woodpeckers, they supported unique and complementary species to the Black-backed Woodpecker in burned habitats. This suggests that while White-headed and Black-backed Woodpeckers are the most important excavators influencing colonization, the complement of all three species of woodpeckers appears to have the greatest influence on colonization of secondary cavity users.

Because population growth of secondary cavity users may depend upon an adequate number of cavities available (Holt and Martin, 1997), successful colonization in burned forests will depend on continued presence of woodpeckers to replenish the supply of cavities.

Although woodpecker species differed in their influence on recovery of birds and small mammals, all three species observed in our study played an important role in supporting the cavity-dependent community through habitat creation for nesting, resting, denning, and roosting. The Black-backed Woodpecker was a significant contributor to the establishment of bird and small mammal species and communities in areas with high burn intensities, and it appeared to have a more narrow range of suitable habitat conditions for nest site selection compared to the Hairy Woodpecker. Thus, the habitat requirements of the Black-backed Woodpecker serve as a useful threshold for managing burned sites for wildlife recovery.

The removal of most or all small snags [snags up to 24 inches in diameter] within a burned area is likely to render the site unsuitable for Black-backed Woodpecker nesting.

Reduction of all small snags may greatly reduce habitat for Black-backed Woodpeckers, which in turn is likely to impact the recovery of bird and small mammal community recovery in burned areas. Maintaining an abundance of suitable woodpecker nesting habitat in burned areas will result in increases in the abundance and diversity of the cavity-dependent community (Aitken and Martin, 2008). Cavity-dependent communities include seed dispersing birds and mammals, insectivores, and predators, which play important roles in the overall ecosystem (Raphael and White, 1978, 1984; Verner and Boss, 1980). This increases the diversity of species performing a variety of ecosystem services. Diversity has been demonstrated to be an essential ingredient to ecosystem stability and resilience (Hooper et al., 2005). Further, small mammal species observed to utilize woodpecker nests also serve as

> important prey items for mid and upper-level carnivores in the montane forest animal communities, such as California spotted owls (*Strix occidentalis occidentalis*), coyotes (*Canus latrans*), weasels (*Mustela* spp.), and martens (*Martes americana*). Reductions in the number of important prey items can have cascading effects on higher trophic levels.

Similarly, a document issued by the Forest Service in conjunction with Point Blue, and titled, "Managing Post-Fire Habitat for Birds in the Sierra Nevada" states:

> Post-fire habitats are not blank slates or catastrophic wastelands, but rather an important part of the ecosystem.
>
> **Strategies for Managing Post-fire Bird Habitat**
> Moderate to high severity post-fire habitat is an important component of the Sierra Nevada for sustaining biodiversity. Many bird species reach their greatest abundance in these habitats, with most sensitive to management actions prescribed following fires, such as salvage logging and shrub abatement.
>
> 1. **Retain large patches with high snag density**. Snags are valuable for nesting and harbor important food resources for birds in post-fire habitat.
> 2. **Manage for dense and diverse shrub habitats**. Post-fire shrub habitats support a diverse bird community including species that are rare or declining in the Sierra and they provide an abundant food resource for many bird species.
> 3. **Promote habitat mosaics.** Bird species richness is often highest at the juxtaposition of unlike habitats in the Sierra.
> 4. **Promote herbaceous understory.** Flowering plants can proliferate after fire and provide a unique and important food resource for many bird species including hummingbirds, sparrows, & finches.
>
> In the Northern Sierra, Forest Service land that was not salvage logged supported a significantly more diverse and abundant avian community than adjacent private land that was heavily salvaged and replanted. In high severity burn areas, snags and understory vegetation provide some of the only available habitat for decades following fire. Areas where these features have been eliminated and dense stands of young conifers have been planted support far fewer species even a decade after re-planting. Natural regeneration should be among the most important strategies for managing post-fire for birds and other wildlife.
>
> Forests that have burned at moderate to high severity provide a unique opportunity for managers to promote desired future conditions. Creating habitat mosaics by considering patch size and location and maintaining snag patches throughout the fire, including the periphery, will promote current and future habitat for birds. Allowing natural tree regeneration will help promote future forest species and structural diversity.

### ***Black-backed woodpeckers and post-fire specialists***

For the black-backed woodpecker, as well as species that rely on cavities, the only way to ensure habitat is maintained, and thus ensure species viability, is to protect post-fire habitat.

"Snag forest habitat", also known as "complex early seral forest" – characterized by predominantly fire-killed trees from relatively recent fire, as well as abundant downed logs and montane chaparral patches and natural conifer regeneration of variable density – supports levels of native biodiversity and wildlife abundance comparable to or greater than old-growth forest, but is much rarer than old-growth forest in the Sierra Nevada (DellaSala et al. (in press), Swanson et al. 2011, Donato et al. 2012, Odion and Hanson 2013). Historically, prior to fire suppression and logging, high-intensity fire in mixed-conifer forests of the Sierra Nevada management region frequently ranged from 15-40% of fire effects, and large patches of high-intensity fire, thousands of acres in size, were a natural part of historic fire regimes (Leiberg 1902, Show and Kotok 1924, USFS 1911, Show and Kotok 1925, Beaty and Taylor 2001, Bekker and Taylor 2001, Hanson 2007). In addition, high-intensity fire patches – especially large patches – create critical "snag forest habitat", which has the highest levels of native biodiversity and total wildlife abundance of any forest habitat type, including old-growth forest. Snag forest habitat is three times rarer than old-growth forest and is the most threatened (by post-fire logging, pre-fire thinning, and fire suppression) and least protected forest habitat type in the Sierra Nevada, and has declined more than fourfold in the past century due to fire suppression (Beaty and Taylor 2001, Bekker and Taylor 2001, Stephens et al. 2007, Miller et al. 2012b, Odion and Hanson 2013).

Forest Service scientists recently concluded that, based upon fire intensity data from 1984-2009, there is too little high-intensity fire on national forests in mixed-conifer/ponderosa-pine forests of the western Sierra Nevada, based upon high-intensity fire rotation intervals of 859 years or more, which they found were unnaturally long (Miller et al. 2012b, Table 3). The authors concluded that "high-severity rotations may be too long in most Cascade-Modoc and westside FS [Forest Service] locations…" (Miller et al. 2012b, p. 15). When the most recent 4 years of data (2010 through 2013) are added, including the Rim fire, Aspen fire, and American fire of 2013 (using fire intensity data provided by the Forest Service, www.fs.fed.us/postfirevegcondition/, and using the Forest Service's own data to define high-intensity fire, Miller and Thode 2007, and conifer forest types, www.dfg.ca.gov/biogeodata/cwhr/), the high-intensity fire rotation interval for this longer time period (30 years) is approximately 805 years in mixed-conifer/ponderosa pine forests on national forests of the western Sierra Nevada—still far too long (indicating far too little high-intensity fire for the ecological health of the forests and the many wildlife species positively associated with high-intensity post-fire habitat). Historically, before fire suppression, natural high-intensity fire rotation intervals in these forests generally ranged from 200 to 400 years (Bekker and Taylor 2001, Hanson 2007, Stephens et al. 2007, Odion and Hanson 2013).

Bekker and Taylor (2001), in a remote unmanaged area of mixed-conifer and upper montane forest in the southern Cascades of California, found that 50-60% of these forests experienced high-intensity fire over a 76-year period prior to effective fire suppression in an unlogged area (a high-intensity fire rotation of about 150 years in that area during that time period). In a modeling study reconstructing historic fire patterns, Stephens et al. (2007) estimated a high-intensity fire rate, prior to 1850, of 5% every 12 to 20 years for ponderosa pine and mixed-conifer forests of the Sierra Nevada (rotation of 240 to 400 years). In another study, Collins and Stephens (2010), an average of 15% high-intensity fire was found in reference mixed-conifer forests with overall fire frequencies that were similar to those used in Stephens et al. (2007), suggesting similar, or slightly shorter, high-intensity fire rotations relative to those modeled in Stephens et al. (2007).

In sum, the multiple sources of data strongly indicate that there is substantially less high-intensity fire now than there was historically. Moreover, not only did high-intensity fire areas comprise a substantial proportion of fire effects historically (prior to fire suppression and logging) on the western slope of the southern Cascades in ponderosa pine/fir, mixed-conifer, and true fir forests (Beaty and Taylor 2001, Bekker and Taylor 2001), high-intensity fire often comprises the majority of fire effects, with individual high-intensity fire patches sometimes reaching thousands of acres in size (Bekker and Taylor 2010).

Even the Forest Service's own documents have acknowledged that snag forest habitat, or complex early seral forest (CESF), is a distinct, natural, and highly important forest habitat type, and recommend that Forest Service land managers recognize this fact, in accordance with the current science (Bond et al. 2012 [p. 10, Recommendation 1.7 and p. 15, Recommendation 9.1], Burnett et al. 2012, p. 5; Manley and Tarbill 2012, Burnett et al. ["Managing Post-Fire Habitat for Birds']). Current science also recognizes that this snag forest habitat (a.k.a., natural, or "complex", early-seral forest) is highly diverse, structurally—similar, in fact, to the high structural diversity cherished in old-growth forest (Donato et al. 2012), and is not at all mimicked by clearcutting or post-fire logging, and artificial replanting, which removes or severely reduces that structural complexity and habitat heterogeneity, reducing native biodiversity (Swanson et al. 2011, Burnett et al. 2012).

Figure 1. Complex early-seral habitat, or "snag forest habitat", with many standing snags, downed logs, patches of montane chaparral, wildflowers, and abundant patches of natural conifer regeneration. Star Fire of 2001, Tahoe National Forest (Photo taken six years post-fire in 2007).

Fig. 2. Post-fire "salvage" logged area, devoid of most important habitat structures. Moonlight Fire of 2007, Plumas National Forest (Photo taken 2009).

Burnett et al. (2010), Fig. 4c, found that total bird abundance in 8-year-old snag forest habitat (i.e., not salvage logged or artificially replanted) in the Storrie fire was higher than in mature unburned forest in the northern Sierra Nevada and western slope of the southern Cascades, and found that nest density of cavity-nesting species peaked in the snag forest habitat patches with the highest tree mortality (Burnett et al. 2010, Fig. 8), leading Burnett et al. (2010, p. 31) to conclude that "areas burned by wildfire, especially those with older high-intensity fire patches, may in some cases support equal or greater landbird diversity and total bird abundance [than unburned forest]". At 11 years post-fire, the highest-intensity fire areas of the Storrie fire (not subjected to salvage logging or artificial replanting) continued to have the highest total bird abundance—about 7.3 birds per point count (Burnett et al. 2012, Fig. 5 [lower right corner]), which is higher than the adjacent mature, unburned forest at 6.9 birds per point count (Burnett et al. 2012, Fig. 4c). Similarly, Donato et al. (2009) found higher plant species diversity in high-intensity fire areas than in old forest.

In a 2008 book on post-fire logging, forest ecologists noted that:

> The notion that salvage logging assists the ecological recovery of naturally disturbed forests is fundamentally incorrect (Lindenmayer et al. 2004). Hence, justifications for salvage logging based on contributions to ecological recovery have little merit. We know of few circumstances where salvage logging has been demonstrated to directly contribute to recovery of ecological processes or biodiversity. [T]here is abundant theoretical and empirical evidence…that salvage logging interferes with natural ecological recovery..."

David B. Lindenmayer, Philip J, Burton, and Jerry F. Franklin, *Salvage Logging and Its Ecological Consequences*, 12-13 (2008).

Here is what America's scientists are finding about snag forest habitat created by higher-intensity fire:

Burnett et al. (2010):

"It is clear from our first year of monitoring three burned areas that post-fire habitat, especially high severity areas, are an important component of the Sierra Nevada ecosystem . . . . [P]ost-fire areas are not blank slates or catastrophic wastelands; they are a unique component of the ecosystem that supports a diverse and abundant avian community . . . ."

"Once the amount of the plot that was high severity was over 60% the density of cavity nests increased substantially."

"[M]ore total species were detected in the Moonlight fire which covers a much smaller geographic area and had far fewer sampling locations than the [unburned] green forest."

"[A]reas burned by wildfire, especially those with older high severity patches, may in some cases support equal or greater landbird diversity and total bird abundance [than unburned forest]."

Noss et al. (2006):

"Overall species diversity, measured as the number of species—at least of higher plants and vertebrates—is often highest following a natural stand-replacement disturbance. . . . [P]ost-fire (salvage) logging does not contribute to ecological recovery; rather, it negatively affects recovery processes . . . ."

"Currently, early-successional forests (naturally disturbed areas with a full array of legacies, ie not subject to post-fire logging) and forests experiencing natural regeneration (ie not seeded or replanted), are among the most scarce habitat conditions in many regions."

Hutto (2006):

"Besides the growing body of evidence that large, infrequent events are ecologically significant and not out of the range of natural variation (Foster et al. 1998, Turner & Dale 1998), an evolutionary perspective also yields some insight into the 'naturalness' of severely burned forests. . . . The dramatic positive response of so many plant and animal species to severe fire and the absence of such responses to low-severity fire in conifer forests throughout the U.S. West argue strongly against the idea that severe fire is unnatural. The biological uniqueness associated with severe fires could emerge only from a long evolutionary history between a severe-fire environment and the organisms that have become relatively restricted in distribution to such fires. The retention of those unique qualities associated with severely burned forest should, therefore, be of highest importance in management circles."

"The ecological cost of salvage logging speaks for itself, and the message is powerful. I am hard pressed to find any other example in wildlife biology where the effect of a particular land-use activity is as close to 100% negative as the typical postfire salvage-logging operation tends to be."

"[S]evere fires are themselves restorative events. . . . [R]ehabilitation occurs naturally as part of plant succession."

<u>Kotliar et al. (2002):</u>

"Many bird species whose abundances were consistently higher in burned compared to unburned forests . . . also appeared to use stand-replacement burns more readily than low-severity and moderate-severity burns."

<u>Hutto (1995):</u>

"Stand-replacement fires should not be viewed as unnatural disasters that can (and should) be prevented."

"Recent full-page ads . . . have, in fact, emphasized the fire-prevention 'benefit' of forest thinning. Such a consequence may be fine at the urban-forest interface. It may be a well-intentioned but misplaced goal, however, for forested wildlands."
"Because the most suitable nest trees for cavity excavation are snags that are themselves old-growth elements, one might even suggest that many of the fire-dependent, cavity-nesting birds depend not only on forests that burn, but on older forests that burn."

<u>Lindenmayer et al. (2004):</u>

"To many ecologists, natural disturbances are key ecosystem processes rather than ecological disasters that require human repair. Recent ecological paradigms emphasize the dynamic, nonequilibrial nature of ecological systems in which disturbance is a normal feature . . . and how natural disturbance regimes and the maintenance of biodiversity and productivity are interrelated."

"[Post-fire] salvage harvesting removes critical habitat for species, such as cavity-nesting mammals, woodpeckers, invertebrates like highly specialized beetle taxa that depend on burned wood, and bryoflora closely associated with recently charred logs."

<u>Letter to Congress from nearly 600 of the nation's top scientists (August 1, 2006):</u>

"When we, as scientists, see policies being developed that run counter to the lessons of science, we feel compelled to speak up. Proposed post-disturbance legislation . . . crafted as a response to recent fires and other disturbances, is misguided because it distorts or ignores recent scientific advances. Under the labels of 'recovery' and 'restoration', these bills would speed up logging and replanting after natural disturbances. . . . [S]uch activity would actually slow the natural recovery of forests and of streams and the creatures within them. . . . [N]o substantive evidence supports the idea that fire-adapted forests might be improved by logging after a fire."

Letter to Congress (November 1, 2013):

"[E]ven in patches where forest fires burned most intensely the resulting post-fire community is one of the most ecologically important and biodiverse habitat types in western conifer forests. Post-fire conditions serve as a refuge for rare and imperiled wildlife that depend upon the unique habitat features created by intense fire. These include an abundance of standing dead trees or 'snags' that provide nesting and foraging habitat for woodpeckers and many other wildlife species, as well as patches of native flowering shrubs that replenish soil nitrogen and attract a diverse bounty of beneficial insects that aid in pollination after fire. Small mammals find excellent habitat in the shrubs and downed logs, deer and elk browse on post-fire shrubs and natural conifer regeneration, bears eat the berries often found in substantial quantities after intense fire, and morel mushrooms, prized by many Americans, spring from the ashes in the most severely burned forest patches. This post-fire habitat, known as 'complex early seral forest,' is quite simply some of the best wildlife habitat in forests and is an essential stage of natural forest processes. Moreover, it is the least protected of all forest habitat types and is often as rare, or rarer, than old-growth forest, due to damaging forest practices encouraged by post-fire logging policies . . . We urge you to consider what the science is telling us: that post-fire habitats created by fire, including patches of severe fire, are ecological treasures rather than ecological catastrophes . . . ."

### a. The Black-backed Woodpecker Conservation Strategy

In the fall of 2012, the U.S. Forest Service, in conjunction with the Institute for Bird Populations, recognized that there is a significant concern regarding the conservation of the black-backed woodpecker population in California, and therefore released a Conservation Strategy for this species (Bond et al. 2012). The Conservation Strategy recommended a number of mitigation measures to reduce the risk of losing population viability of this species in California. Among the conservation measures established are the following: a) identify the areas of the highest densities of the largest snags, and do not salvage log such areas; b) if the Forest Service decides to conduct post-fire logging in a particular area, logging units should not be bigger than 2.5 hectares, or 6.2 acres, in order to reduce fragmentation and maintain some connectivity in logged areas (page 10, Recommendation 1.3); c) maintain dense, mature forest conditions adjacent to fire areas in order to prolong the suitability of fire areas for Black-backed Woodpeckers--by several years post-fire, Black-backeds will sometimes move to fire edges where delayed tree mortality in moderate-severity fire areas, and in adjacent unburned areas due to beetles radiating outward from the fire edge, can create a pulse of more recent snags (page 10, Recommendation 1.4); and d) avoid post-fire logging during nesting season, May 1 through July 31 (page 10, Recommendation 1.5). None of these recommendations are made explicit in the Plan's Standards/Guidelines.

## b. Siegel et al. (2013) Findings, and other Studies, Regarding Snag Density and Post-fire Logging

Siegel et al. (2013), at page 45, found that, except for the three birds that foraged substantially in unburned forest (and for which Siegel et al. expressed major concerns), every bird had mean snag basal areas of more than 17 square meters/hectare, i.e., more than 74 square feet/acre of snag basal area. Areas selected by Black-backed Woodpeckers for foraging had about 13 snags in a 10-meter radius plot (0.031 hectares), or about 415 snags per hectare (about 170 snags per acre) (Siegel et al. 2013, p. 49, Table 6). The level of snags in places used by Black-backed Woodpeckers was about four times higher than random locations (Siegel et al. 2013, p. 49, Table 6). The three most significant factors in determining successful Black-backed Woodpecker foraging were large snags, medium snags, and small snags (Siegel et al. 2013, p. 49). Snag levels were even higher in sites selected for nesting by Black-backed Woodpeckers, averaging about 18 snags per 10-meter radius plot, or about 570 snags/hectare (about 232/acre) (Siegel et al. 2013, p. 59, Table 13). Black-backed Woodpecker occupancy was positively related to fire severity (Siegel et al. 2013, p. 47). Further, Siegel et al. (2013), on page 33, noted "the general absence of foraging locations within the post-fire harvest areas." Black-backed Woodpecker occupancy was adversely affected by post-fire salvage logging (Siegel et al. 2013, p. 47). The Plan's Standards/Guidelines do not explicitly incorporate these findings in regard to snag protections.

In addition, the following are some key studies (with annotated descriptions of findings) regarding Black-backed Woodpeckers:

Burnett, R.D., P. Taillie, and N. Seavy. 2011. Plumas Lassen Study 2010 Annual Report. U.S. Forest Service, Pacific Southwest Region, Vallejo, CA. ***(Black-backed Woodpecker nesting was eliminated by post-fire salvage. See Figure 11 [showing nest density on national forest lands not yet subjected to salvage logging versus private lands that had been salvage logged.])***

Burnett, R.D., M. Preston, and N. Seavy. 2012. Plumas Lassen Study 2011 Annual Report. U.S. Forest Service, Pacific Southwest Region, Vallejo, CA. ***(Black-backed Woodpecker potential occupancy rapidly approaches zero when less than 40-80 snags per acre occur, or are retained, Fig. 8 [occupancy dropping towards zero when there are fewer than 4-8 snags per 11.3-meter radius plot—i.e., less than 4-8 snags per 1/10$^{th}$-acre, or less than 40-80 snags per acre.])***

Hanson, C. T. and M. P. North. 2008. Postfire woodpecker foraging in salvage-logged and unlogged forests of the Sierra Nevada. Condor 110:777–782. ***(Black-backed Woodpeckers selected dense, old forests that experienced high-severity fire, and avoided salvage logged areas [see Tables 1 and 2].)***

Odion, D.C., and Hanson, C.T. 2013. Projecting impacts of fire management on a biodiversity indicator in the Sierra Nevada and Cascades, USA: the Black-backed Woodpecker. The Open Forest Science Journal 6: 14-23. ***(High-severity fire, which creates primary habitat for Black-backed Woodpeckers, has declined by sixfold since the early 20$^{th}$ century in the***

***Sierra Nevada and eastern Oregon Cascades due to fire suppression. Further, the current rate of high-severity fire in mature/old forest (which creates primary, or high suitability, habitat for this species) in the Sierra Nevada and eastern Oregon Cascades is so low, and recent high-severity fire in mature/old forest comprises such a tiny percentage of the overall forested landscape currently (0.66%, or about 1/150$^{th}$ of the landscape), that even if high-severity fire in mature/old forest was increased by several times, it would only amount to a very small proportional reduction in mature/old forest, while getting Black-backed Woodpecker habitat closer to its historical, natural levels. Conversely, the combined effect of a moderate version of current forest management—prefire thinning of 20% of the mature/old forest (in order to enhance fire suppression) over the next two decades, combined with post-fire logging of one-third of the primary Black-backed Woodpecker habitat, would reduce primary Black-backed Woodpecker habitat to an alarmingly low 0.20% (1/500$^{th}$) of the forested landscape, seriously threatening the viability of Black-backed Woodpecker populations.)***

Rota, C.T. 2013. Not all forests are disturbed equally: population dynamics and resource selection of Black-backed Woodpeckers in the Black Hills, South Dakota. Ph.D. Dissertation, University of Missouri-Columbia, MO. (***Rota (2013) finds that Black-backed Woodpeckers only maintain stable or increasing populations (i.e., viable populations) in recent wildland fire areas occurring within dense mature/older forest (which have very high densities of large wood-boring beetle larvae due to the very high densities of medium/large fire-killed trees). And, while Black-backeds are occasionally found in unburned forest or prescribed burn areas, unburned "beetle-kill" forests (unburned forest areas with high levels of tree mortality from small pine beetles) and lower-intensity prescribed burns have declining populations of Black-backed Woodpeckers (with the exception of a tiny percentage of beetle-kill areas). The study shows that unburned beetle-kill forests do not support viable populations, but very high snag-density beetle-kill areas tend to slow the population decline of Black-backed Woodpeckers in between occurrences of wildland fire. Population decline rates are alarmingly fast in low-intensity prescribed burn areas, indicating that such areas do not provide suitable habitat. Black-backed Woodpeckers are highly specialized and adapted to prey upon wood-boring beetle larvae found predominantly in recent higher-severity wildland fire areas. Moreover, while Black-backed Woodpeckers are naturally camouflaged against the charred bark of fire-killed trees, they are more conspicuous in unburned forests, or low-severity burned forests, and are much more vulnerable to predation by raptors in such areas. For this reason, even when a Black-backed Woodpecker pair does successfully reproduce in unburned forest or low-severity fire areas, both juveniles and adults have much lower survival rates than in higher-severity wildland fire areas.)***

Saab, V.A., R.E. Russell, and J.G. Dudley. 2009. Nest-site selection by cavity-nesting birds in relation to postfire salvage logging. Forest Ecology and Management 257:151–159. ***(Black-backed Woodpeckers select areas with about 325 medium and large snags per hectare [about 132 per acre], and nest-site occupancy potential dropped to near zero when snag density was below about 270 per hectare, or about 109 per acre [see Fig. 2A, showing 270 snags per hectare as the lower boundary of the 95% confidence interval].***

Seavy, N.E., R.D. Burnett, and P.J. Taille. 2012. Black-backed woodpecker nest-tree preference in burned forests of the Sierra Nevada, California. Wildlife Society Bulletin 36: 722-728. ***(Black-backed Woodpeckers selected sites with an average of 13.3 snags per 11.3-meter radius plot [i.e., 0.1-acre plot], or about 133 snags per acre.)***

Siegel, R.B., M.W. Tingley, and R.L. Wilkerson. 2011. Black-backed Woodpecker MIS surveys on Sierra Nevada national forests: 2010 Annual Report. A report in fulfillment of U.S. Forest Service Agreement No. 08-CS-11052005-201, Modification #2; U.S. Forest Service Pacific Southwest Region, Vallejo, CA. ***(Black-backed woodpecker occupancy declines dramatically by 5-7 years post-fire relative to 1-2 years post-fire, and approaches zero by 10 years post-fire [Fig. 15a].)***

Siegel, R.B., M.W. Tingley, R.L. Wilkerson, and M.L. Bond. 2012. Assessing home range size and habitat needs of Black-backed Woodpeckers in California: 2011 Interim Report. Institute for Bird Populations. A report in fulfillment of U.S. Forest Service Agreement No. 08-CS-11052005-201, Modification 3; U.S. Forest Service, Pacific Southwest Region, Vallejo, CA. ***(Black-backed woodpeckers strongly select large patches of higher-severity fire with high densities of medium and large snags, generally at least 100 to 200 hectares (roughly 250 to 500 acres) per pair, and post-fire salvage logging eliminates Black-backed woodpecker foraging habitat [see Fig. 10, showing almost complete avoidance of salvage logged areas].)***

Tarbill, G.L. 2010. Nest site selection and influence of woodpeckers on recovery in a burned forest of the Sierra Nevada. Master's Thesis, California State University, Sacramento. ***(In post-fire eastside pine and mixed-conifer forests of the northern Sierra Nevada, Black-backed woodpeckers strongly selected stands with very high densities of medium and large snags, with well over 200 such snags per hectare on average at nest sites [Table 2], and nesting potential was optimized at 250 or more per hectare, dropping to very low levels below 100 to 200 per hectare [Fig. 5b].)***

The above information makes clear that viability of black-backed woodpeckers is maintained by protecting the post-fire high snag densities in intensely burned forest, and the Plan should make this explicit with direct references to the literature and the Conservation Strategy.

### ***<u>California spotted owls and martens</u>***

In regard to California spotted owls and martens, the Plan fails to appropriately address the adverse consequences to the late-seral closed-canopy forest these species rely upon. For instance, the 1988 Forest Plan (p. IV-27) contained specific quantitative protections for management of old forest habitat. Much research has transpired since then showing just how important closed canopy forest is for spotted owls and martens and yet there is almost no protection for such habitat in the Plan, and instead the Standards/Guidelines would allow significant harm to this habitat type under the ruse of "forest health" and fire protection.

Unlike the 1988 Plan, there are no specific requirements to protect mature and old-growth forest, and there are not any requirements to retain minimum basal area levels associated with suitable habitat (Verner et al. 1992) in Spotted Owl Protected Activity Centers (PACs) or Home Range Core Areas (HRCAs). Moreover, the Plan does not specify minimum canopy cover retention requirements for these Spotted Owl areas. Instead, the Plan allows removal of old-growth trees up to 30 inches in diameter; allows removal of old-growth trees of any size under broad exceptions to the 30-inch diameter limit (and these exceptions, as already explained above, swallow the rule), allows cuts up to 10 acres in size in the forests of the Lake Tahoe Basin, with no restrictions on doing so within occupied Spotted Owl territories. And, nowhere in the FEIS is there an analysis of adverse impacts regarding the removal of protections for old-growth forest, nor is there an analysis of the adverse impacts that can occur as a result of the lack of standards for mature and old-growth forest. This violates NEPA. *Pac. Rivers Council v. United States Forest Serv.*, 2012 U.S. App. LEXIS 12553, *31 ("'hard look' should involve a discussion of adverse impacts that does not improperly minimize negative side effects").

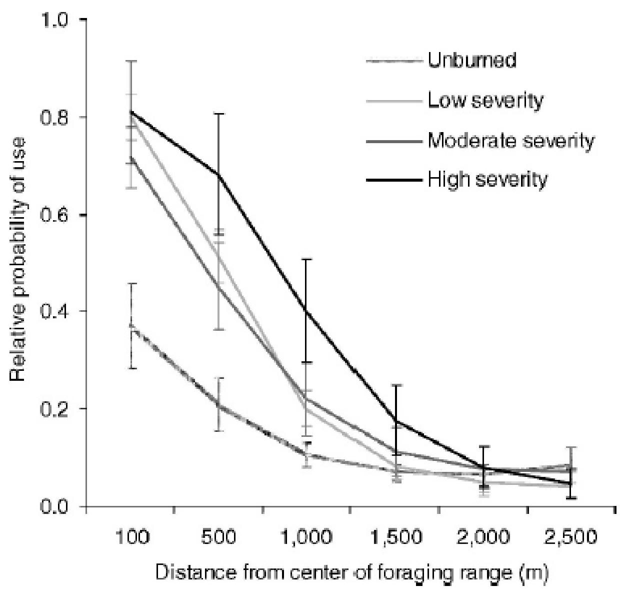
Rather than address the issue of habitat loss, the Forest Service seems to be suggesting that high-severity fire will harm the owl and that therefore areas must be logged in order to prevent high-severity fire. The only cite that is provided for the assertion that high-severity fires can have a pronounced negative effect on spotted owl populations is Lee and Irwin 2005. However, Lee and Irwin 2005 is simply a modeling effort that *assumed* that fire is harmful to owls – the study itself did not investigate what the actual relationship is between fire and owls. In fact, Lee and Irwin note that "Direct empirical evidence regarding the effect of fire on owls is scant. A recent, qualitative review of the short-term effects of wildland fire on important demographic parameters identified 11 territories that experienced wildland fire from among >300 study territories, 8 of which had information on fire severity (Bond et al., 2002). Bond et al. (2002) concluded that relatively large wildland fires that burned >80% of each of these 11 territories, primarily at low to moderate severity, apparently had little short-term (1 year) effect on individual survival, site fidelity, mate fidelity, and reproductive success of spotted owls." This is important because the Forest Service is assuming that high severity fire is purely negative to owls when the available science suggests otherwise. In light of the science indicating that California Spotted Owls benefit from closed-canopied old forest for nesting and roosting and preferentially select unlogged moderate-severity and high-severity fire areas for foraging (Bond et al. 2009), the FEIS fails to articulate a sound or clear ecological rationale for intensively managing suitable owl habitat (including PACs AND HRCAs) to reduce stand density and canopy cover, as well as preclude high-severity fire.

Furthermore, it is being generically argued that "increasing density of late seral closed canopy conditions on the landscape could put these stands at a higher risk of vulnerability from bark beetles, drought, and other effects of a changing climate" and that a 30" dbh restriction "will inhibit managers to enhance older stands of trees and would likely result in a more rapid decline in late seral conditions." These claims ignore the fact that dense forests are essential to the future of the spotted owl. In Seamans and Gutiérrez (2007), they "found that the amount of mature conifer forest [coniferous forest with >70% canopy cover dominated by medium [30.4–60.9 cm dbh] and large [>60.9 cm dbh] trees] was correlated with Spotted Owl habitat choice. Territories with more mature conifer forest had a higher probability of being colonized and a lower probability of becoming unoccupied." In his 2005 dissertation, Seamans explained that his results "corroborated many of the findings of Franklin et al. (2000) and Olson et al. (2004). It was apparent from their studies, Blakesley (2003), and my study, that forests dominated by medium and large trees, as measured at the territory scale, were important to population dynamics of both subspecies. Further, because examination of habitat quality within the context of population parameters leads to much stronger inferences regarding habitat requirements (Morrison 2001, Noon and Franklin 2002), my results not only supported but strengthened the general contention by Verner et al. (1992) that California spotted owls should be considered specialists of these forest types." The Forest Plan proposes to lower canopy cover in owl and marten territories via logging treatments, and yet no explanation is provided for why these adverse consequences are justified.

Moreover, the EIS ignores the fact that owls and martens have evolved with ecological disturbances such as disease, high-severity fire and insects. Indeed, these impacts can be positive, not negative, to wildlife like owls (e.g., Bond et al. 2009) and the EIS fails to address that fact or to support its own position which is contradicted by the science showing that logging harms owl and marten habitat. In fact, the EIS fails to explain why more trees will not be killed (and removed) by logging than would likely occur due to fire or insects or disease. Thus, there is no ecological rationale for intensively managing the forest (including PACs AND HRCAs) to reduce stand density and canopy cover, and the EIS's failure to take a hard look and to adequately address adverse impacts violates NEPA. *Pac. Rivers Council v. United States Forest Serv.*, 2012 U.S. App. LEXIS 12553.

The Forest Service currently uses definitions of suitable habitat that are nearly two decades old and based on suitability definitions in forests not affected by fire. Bond et al. (2009) found California Spotted Owls inhabiting a burned landscape four years post-fire (McNally Fire) had a significantly greater probability of using a burned site for foraging than an unburned site within 1.5 km of the nest or core-roost area. Furthermore, the greatest selection probability was for high-severity burned sites closest to the nest/core. As opposed to Clark's study area, the habitat available to this sample of owls experienced very little post-fire salvage logging, confirming that owls are able and willing to use unlogged severely burned forests for foraging. Bond et al. (2009) actually mapped salvage logged areas, which were a very small proportion of the landscape, but owls were detected in those areas only 3 times out of 301 foraging locations (unpublished data), similar to the very few locations in salvage-logged areas reported by Clark (2007). Thus, salvage logged stands were essentially non-habitat for the sample of foraging owls in the McNally Fire as well as the fires in Clark's study area. Moreover, owl home ranges in mixed-severity forests in the McNally fire area were similar to those in unburned mature/old forests (the ones in the fire area were actually somewhat smaller, indicating high territory fitness, but there was no statistically significant difference), and the owls had an abundant diet of small mammals in the post-fire habitat (Bond et al. 2013).

Another recent paper discussing the landscape-scale effects of fire on California Spotted Owls in the Sierra Nevada is Lee et al. (2012). Lee et al. (2012) my I used modern occupancy modeling techniques and 11 years of Forest Service survey data from 41 burned and 145 unburned California Spotted Owl breeding sites throughout the Sierra Nevada, including before- and after-fire survey data for the burned sites (which included all 6 fires during that time period for which Spotted Owl survey data were available). Fires that occurred from 2000 to 2007 had no significant effect on local colonization and extinction rates for these sites. In other words, there were no differences in occupancy rates between burned and unburned sites, after accounting for detectability. Lee et al. (2012) reported the average amount of suitable habitat and the average burn severity of the sites (32 percent high-severity, on average, of all forested habitat, conifer and hardwood). This 32 percent figure from Lee et al. was an average—not an absolute threshold above which fire would render a site unoccupied, and Lee et al. (2012, on p. 798) included Spotted Owl sites with well over 50% high-severity fire, the majority of which remained occupied post-fire (until and unless they were salvage logged). Previous studies also found that sites with a relatively high degree of high-severity burn around core areas can be occupied and reproductive (Bond et al. 2002, Jenness et al. 2004). However, territories that are salvage logged following fire, within a 1128-meter radius around the territory center, strongly tend to lose occupancy (Lee et al. 2012), which is a major concern in this fire area, given planned logging within multiple spotted owl territories.




Bond et al. (2009) observed foraging-site selection for all burned sites within approximately 1.5 km of the center of the foraging range (nest trees or core roost sites). See Figure at left. Because of this result, they recommended not conducting salvage-logging within 1.5 km of nests or core roost sites until effects of salvage are more fully understood (Bond et al. 2009; page 1,123). The plan appears to ignore this important recommendation. And it appears that PACs are being wrongly realigned after fires to exclude the high/moderately burned stands. This creates a context for a future erroneous conclusion by the Forest Service that because a project does not conduct salvage within the re-drawn PAC, then the project does not result in a trend towards listing or loss of viability. This circular approach (i.e. re-drawing a PAC to exclude the areas to be salvage logged and then stating the salvage logging will not occur in the PAC thus the effect on the PAC is insignificant) fails to acknowledge and incorporate the finding that owls select high/moderate burned sites within 1.5 km of core areas for foraging – which is particularly important given that owls were detected in the area after the fire.

The FEIS also continues to proceed on the false assumption that owl populations are stable. As discussed in our comments, the regional demographic studies indicate that owl populations on Forest Service lands are *declining*. For example, in the closest study area to Tahoe, the Eldorado National Forest, owls have declined substantially over the last decade. Tempel and Gutierrez 2013 determined in a tracking methods-model performance study that territory occupancy declined during their study (t = 0.702, 95% CI 0.552–0.852) due to increasing territory extinction rates and decreasing colonization rates. The project manager of the Eldorado Spotted Owl Study, Doug Temple, observed, "a significant population decline, as evidenced by the geometric mean of the finite rate of population change (ˆ= 0.969, 95% CRI 0.957, 0.980) and the resulting realized population change (proportion of the initial population present in 2012; ˜2012 = 0.501, 95% CRI 0.383, 0.641).

The FEIS wrongly relies on an inappropriate interpretation of the demographic results from Conner et al. (2013) to assert that the owl population decline is still in question. What the FEIS fails to acknowledge in reporting the results of Conner et al. (2013) is that the paper specifically sets out to develop an approach that provides a more informed and useful interpretation of estimates of population change derived from the demographic studies. As stated in Conner et al. (2013):

> In the past, the confidence intervals (CI) for estimates of mean $\lambda$ and of $\Delta_t$ were used to evaluate population decline. That is, if the CI included 1, even if just barely, the conclusion was that there was no evidence for a decline. However, with this methodology, the influence and probability of a Type II error (inability to detect a decline or change) cannot be eliminated from the interpretation of no decline. The key element missing in this approach was the ability to estimate the probability of decline. Using Bayesian Markov chain Monte Carlo (MCMC) methods, a posterior distribution of $\Delta_t$ can be used to estimate any probability of decline.

Conner et al. developed this new method to evaluate the probability of decline for three study areas and found that:

> Results from $\Delta_t$ analyses highlight that small differences in mean $\lambda$ from 1.0 (stationary) can result in large differences in population size over a longer time period; these temporal effects are better depicted by $\Delta_t$.

These results form the basis for the conclusion that the population is declining.

The studies occurring on the national forest (LAS and SIE) indicate that the probability of a decline greater than 15% was substantial (p=0.69 and 0.40, respectively) compared to the study in the national park (SKC) (which has no logging and maintains an active mixed-intensity fire regime) that has a very low probability of the same degree of decline (i.e., p=0.04). This suggests that management practices on national forest lands, which are very different on national park lands, are likely contributing to the population decline. Therefore, for the Plan and EIS to discount these results is wrong and illegal.

The FEIS even goes so far as to claim that "although there is concern that there may be localized declines in the spotted owl populations, the confidence intervals overlapping one (1) makes it difficult to assess the probability of a decline." Conner et al. (2013), in fact, evaluated the probability of decline and found that there is a decline in the two study areas on national forest lands. Furthermore, the scientists concluded that:

> For retrospective analyses of monitored populations, using Bayesian MCMC methods to generate a posterior distribution of $\square_t$ is a valuable conservation and management tool for robustly estimating probabilities of specified declines of interest.

Failing to appropriately disclose the results of scientific studies is contrary to NEPA and contrary to sound science.

At the level of forest planning, the population declines in the three Sierra Nevada study areas, all occurring during the time that the Forest Service has been implementing its fuels reduction strategy, demonstrate that fuel treatments are likely contributing to loss of quality owl habitat, leading to changes in owl reproductive success in PACs. As discussed below, the Forest Service's approach of relying on the low chance that owls are stable in the face of considerable documented risk and uncertainty does not ensure the viability of spotted owls in the future in the Tahoe Basin.

The BE and FEIS define suitable habitat for owls as including 3M, 3D, 5P and 5S habitats. But there is no support for this assumption. Instead, suitable habitat is defined in the current forest plan as follows:

> Based on the above studies, suitable owl habitat, as described using CWHR classification, is identified as 4M, 4D, 5M, 5D and 6 in mixed conifer, red fir, ponderosa pine/hardwood, foothill riparian/hardwood, and the east side pine forest (USDA Forest Service, Pacific Southwest Region 2001a). Nesting habitat is further defined as CWHR classes 5M[1], 5D and 6. [Footnote 1: Because the canopy cover within the "M" class ranges from 40 to 59%, not all CWHR class 5M should be considered nesting habitat. The threshold between canopy cover values that contribute to or detract from occurrence and productivity is a value near 50% (USDA Forest Service, Pacific Southwest Region 2001a, Hunsaker et al. 2002).

(USDA Forest Service 2004, p. 267) Here, the FEIS defines open canopy as CWHR P & S, which could mean that logging resulting in stands with 10% canopy cover would still maintain suitable habitat, according to the unsupported assumptions in the FEIS. Similarly, logging that reduced mean tree diameter to between 6-12" (CWHR 3M and 3D) would also fit this definition of suitable habitat, yet these types are not suitable habitat for owls.

The FEIS also makes a highly questionable assumption that lower canopy 4M forests can provide suitable nesting habitat for owls, but offers no citation to any published data source to support this.

The Plan's fuel objectives are met by all of the alternatives, including Alternative D, which limits logging to hand thinning of trees up to 12" dbh. Nevertheless, the Plan and FEIS continue to rely on the vague objective of achieving "forest restoration" to justify more aggressive treatments in sensitive areas such as protected activity centers and home range core areas. Nothing in the Plan or FEIS defines what constitutes forest restoration with respect to spotted owls or what criteria will be used to determine the level of logging necessary to achieve the undefined goal. This violates NEPA, as well as applicable regulations. *See* 36 CFR § 219.7 (b) (Objectives "are concise statements describing measurable results intended to contribute to sustainability (§ 219.19)... Objectives include an estimate of the time and resources needed for their completion.")

The Plan’s desired conditions for owl PACs and HRCA's also state that owl PACs shall have a) at least two tree canopy layers, b) dominant and co-dominant trees with average diameters of at least 24 inches dbh, c) at least 70 percent canopy cover, and d) higher than average levels of snags (preferably larger than 45 inches dbh) for the stand type, and downed woody material (preferably larger than 20 inches in diameter at the large end) in diverse decay classes, distributed unevenly. These desired conditions contradict the Forest Service’s unsupported desire to log owl habitat.

This contradiction is substantial because it is under the guise of "restoration" that the Forest Service may permit logging in PACs and HRCAs. Here the standards and guidelines allow for reducing canopy layers in the name of restoration but the Plan contains no definition of what constitutes a "restored" PAC or what suite of conditions would trigger the Forest Service to decide to log PAC and HRCA habitat down below minimum canopy standards in the name of "restoration."

Moreover, the FEIS does not coherently evaluate the tradeoffs it purports to be analyzing. The tradeoff is not between treatment and stand-replacing fire but rather between treatment and the *chance* of stand-replacing fire. And, even this comparison would be wrong because stand-replacing fire has *benefits* for owls, as already explained. Thus, because the FEIS and Plan continue to present a false comparison, they fail to meet NEPA’s “hard look” mandate. And again, this is extremely problematic given that the objective being sought through forest treatments – preventing stand-replacing fire – is actually not something that ought to be sought from an owl perspective. Thus, if the tradeoffs were accurately presented, very different analyzes would be conducted and different conclusions likely reached.

The Plan does not ensure the future viability of spotted owls in the Tahoe Basin. The Plan proposes considerable logging in owl PACs and HRCAs, which will contribute further to their already low habitat quality resulting in continued reproductive failures for owls.

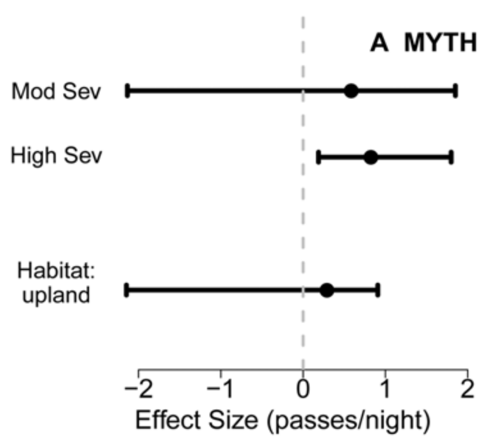
Meanwhile, the most robust and relevant study on the effect of logging on owl survival and reproduction taking place on the adjacent Eldorado National Forest has identified that the loss of dense overhead forest cover due in part to logging impacts is positively correlated with the disappearance of owls from their historical nesting areas. The studies show that the Eldorado population is in decline, and that its decline is consistent with the other two ongoing owl studies on other National Forest lands where logging is also occurring. We do not agree that the Forest Service's approach of relying on the low chance that owls are stable in the face of considerable documented risk and uncertainty, as well as conclusions that populations are indeed declining (Conner et al. 2013), can ensure the viability of spotted owls in the future in the Tahoe Basin.

The Planning regulations require the Forest Service to ensure viability for spotted owl through clear objectives supported by standards and guidelines, but here the Plan allows potentially substantial logging in PACs and HRCAs, including reducing canopy levels below minimum standards based on a vague objective to achieve "restoration." Once owls depart a PAC or HRCA, the Plan allows for conversion to general forest. As owl territories become unoccupied in light of ongoing logging, the Plan makes no commitment to ensure owl viability in the Forest. The Plan contains no cumulative thresholds - relating to canopy cover, average tree size or any other relevant habitat measure - that must be met across the home range, home range core, or core area for owls. There is no explanation for how viability can be assured.

In light of recent science indicating that California Spotted Owls benefit from closed-canopied old forest for nesting and roosting and preferentially select unlogged moderate-severity and high-severity fire areas for foraging (Bond et al. 2009), and that mixed-severity fire (with an average of 32% high-severity effects) does not reduce California Spotted Owl occupancy in the Sierra Nevada, unlike post-fire logging (Bond et al. 2012, in press), the FEIS fails to articulate a sound or clear ecological rationale for intensively managing the suitable Spotted Owl habitat (including PACs AND HRCAs) to reduce stand density and canopy cover, as well as preclude high-severity fire in all fuels treatments and prescribed fire. Moreover, the DEIS fails to determine the quantity and quality of habitat necessary to maintain at least viable populations of the California Spotted Owl on the LTBMU planning area. As such, the FEIS and Plan fail to comply with the 1982 NFMA regulations regarding the viability of Spotted Owls.

***Bats***

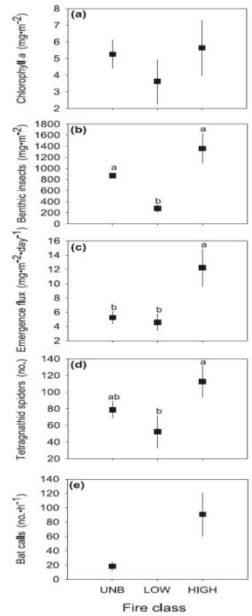
The importance of burned forest has also been demonstrated for bats, including the pallid bat (*Antrozous pallidus*) and the fringe-tailed myotis (*Myotis thysanodes*) in the Sierra Nevada. In an important study recently published, Buchalski et al. (2013) recorded significantly more passes per night for bats (as an index of activity) in very large patches of high-severity burned forest one year post-fire in the McNally Fire in the Sequoia National Forest. This was the first study to document response of bats to fires of different severities in the Sierra Nevada. The figures below (from Figure 2 of Buchalski et al. 2013) show bat activity relative to unburned riparian control stands for the fringe-tailed myotis (A) and the pallid bat (D).




The authors concluded on p. 4:

"Our results suggest response of bats to wildfire in the southern Sierra Nevada in California varies among species, but that **most phonic groups show higher activity in areas burned with moderate- to high-severity**." (emphasis added).

Studies in other regions have reported similar increased use of high-severity burned forests by bats. Malison and Baxter (2010) compared various food web components in unburned watersheds with those that had experienced low- and high-intensity fire. The researchers measured local-scale responses across three trophic levels: biomass of periphyton (attached stream algae), benthic insects and emergence of adult aquatic insects, and occurrence of spiders and bats. The study was conducted 5 years post-fire in Douglas-fir and ponderosa pine forests in the Frank Church River of No Return Wilderness in central Idaho. High-severity burned sites had almost five times the biomass of zoobenthic insects than low-intensity burned sites. High-severity sites also had highest number of emerging adult aquatic insects, more than 3 times more than low-severity burned and 2 times more than unburned. The frequency of bat echolocation calls was significantly greater in high-severity burned sites than in unburned sites. These stark results of the benefits of high-severity fire are shown in graphical format in the Figure to the right from Malison and Baxter (2010), which shows food web components in 3 fire classes within 16 streams, (a) periphyton chlorophyll a; (b) biomass of benthic insects; (c) emergence flux; (d) no. of tetragnathid spiders; (e) no. of bat echolocation calls.




The bats' increased use of severely burned forests over unburned forests in the Sequoia National Forest suggests that wildfire does not reduce suitability for these bats, but actually enhances it, and post-fire salvage logging would remove or severely reduce most of the habitat features created by high-severity fire which are potentially important to bats (e.g., snags for roosting, and flowering shrubs, which are important for flying insect prey).

Until the above wildlife issues are addressed and corrected, the Plan and EIS cannot be said to comply with NFMA or NEPA's "mandates.

### ***General Forest Desired Conditions and Standards/Guidelines***

The Desired Conditions for the LTBMU are in stark contrast to the needs of wildlife. There is a generic assumption that forests should be open and park-like with low basal area when in fact, the best available wildlife science demonstrates that species like owls, martens, bats, and woodpeckers *require* dense forest with high basal area and complex structure.

The Plan wrongly emphasizes forestry objectives over ecology by promoting the reduction of fire, beetles, and disease. However, all of these forest attributes are absolutely essential to the ecological well-being of the forest because wildlife depends upon the structures/habitat created by fire, beetles, and disease. Because the FEIS does not evaluate the ecological benefits associated with fire, disease, and beetles, and fails to provide meaningful data to demonstrate that there is somehow "too much" disease or insects on the landscape, it fails to examine how the reduction or loss of these forest attributes will harm the forest. Indeed, the EIS is thus far assuming without justification that these forest attributes are only negative. Thus, until the EIS meaningfully addresses the role of fire, beetles, and disease, it will not meet NEPA's "hard look" mandate.

The desire to reduce tree mortality in the forest from native beetles is wrong. Indeed, according to the Forest Service's own data, it appears that the Forest Service's direction would allow far *higher* tree mortality, through logging, than would result from beetles, and the FEIS does not divulge this or explain how increasing tree mortality, and reducing future snag recruitment, advances ecological integrity.

As discussed in our comments, the areas proposed for commercial logging could easily see 50-90% tree mortality, or more, directly from chainsaws. However, the science shows that, even at high stand densities, only about 5-10% mortality occurs in these forest types. Further, this is corroborated by North (2012 [p. 17, Fig. 2-1]), which shows that, even at high Stand Density Index levels of 300 to 500, mortality is only 4-12%; and basal area mortality is only about 8-12% even at stand basal area levels of 250 to over 300. North (2012 [p. 18]) summarizes the scientific literature on natural mortality levels in unburned forest and concludes that *average* levels of about 9-14% are quite normal and natural for these forest types in unburned forests.
The FEIS fails to provide a rational connection between the stated goal of reducing tree mortality, the science, and the reality of the Plan. Moreover, the FEIS does not adequately divulge and analyze what the expected/predicted levels of tree mortality would be from logging pursuant to the Plan as adopted, compared to expected natural mortality levels, or to mortality levels from Alt. D.

Furthermore, the risks/harms of commercial logging are either not considered, or are improperly minimized. This violates NEPA's hard look standard because numerous scientific studies document significant harm to rare, imperiled, and/or at-risk wildlife species, such as the Spotted owl (Seamans and Gutierrez 2007, Dugger et al. 2011) and Black-backed Woodpecker (Hanson and North 2008, Hutto 2008), from commercial logging activities—both commercial thinning and salvage logging.

This is a particularly serious analytical failure, given that the Plan allows logging up to 10 acres in size, logging of trees over 30 inches in diameter at breast height under very broad exceptions including trees that are a "source of insects" (which pertains to virtually every old-growth tree in the forest), and contains no retention requirements in logging operations for basal area, no canopy cover retention requirements in logging operations outside of Spotted Owl Protected Activity Centers (PACs) and Home Range Core Areas (HRCAs), and allows commercial logging within Spotted Owl PACs and HRCAs with no basal area retention requirements or clear canopy cover retention standards to ensure that Spotted Owl suitable *nesting and roosting* habitat levels, in terms of live tree basal area (185-350 square feet per acre), large (>15 inches diameter) snag basal area (20-30 square feet per acre), and canopy cover (over 70%) are retained (Verner et al. 1992, defining suitable Spotted Owl habitat in unburned forest; see also USDA 2001b [Vol. 3, Table 4.4.2.1c], Bond et al. 2004, Irwin et al. 2007).

The FEIS fails to provide a map of current old-growth forest habitat, and fails to provide any data, or maps, on the estimated effect (degree of increase or decrease over time) of each alternative on this key resource. Thus the FEIS fails to adequately analyze impacts of the proposed forest plan revision on old-growth forest. This is particularly serious, given that, as discussed above, the Plan would allow logging up to 10 acres in size—even in old-growth forest, would allow old-growth trees to be removed under broad exceptions—including the presence of native insects on an old-growth tree, would allow intensive mechanical thinning in old-growth forest with no basal area retention requirements, would allow any level of canopy cover reduction in old-growth forest outside of Spotted Owl PACs and HRCAs, and even within PACs and HRCAs does not include clear canopy cover retention requirements.

Similarly, the FEIS fails to provide an estimate of the *extent to which* each alternative would affect, over time, suitable habitat for Sensitive Species, such as suitable nesting and roosting habitat for the California spotted owl, or Management Indicator Species, such as the Black-backed Woodpecker (MIS are bellwethers which indicate the health of the entire population of wildlife species with similar habitat associations, and are the core of the wildlife viability requirement of the 1982 NFMA regulations).

For these reasons, the FEIS simply fails to take a hard look at the impacts of the plan, or the other alternatives, and fails to properly present vital data on key resources, in violation of both NEPA and NFMA. We know that the U.S. Forest Service is able to produce such estimates of habitat change over time by alternative because this was done in Volume 3 of the Final EIS for the 2001 Sierra Nevada Forest Plan Amendment (USDA 2001b).

The FEIS also fails to acknowledge a) the fact that the scientific data indicate that the levels of high-severity fire in the LTBMU have declined relative to natural, historic levels since the 19$^{th}$ century, causing a conservation concern for the native biodiversity associated with the habitat created by such fire (Nagel and Taylor 2005); and b) the high biodiversity and ecological value of moderate-severity and high-severity fire areas, which create "snag forest habitat" (Nagel and Taylor 2005, Burnett et al. 2010, Swanson et al. 2010). The FEIS is simply devoid of any analysis regarding the ecological implications of the large loss of this snag forest habitat since the 19$^{th}$ century due to fire suppression (Nagel and Taylor 2005) with regard to species like the Black-backed Woodpecker and other post-fire associates.

The FEIS similarly contains significant inaccuracies, omissions, and inadequacies regarding its analysis of vegetation, including:

- The FEIS states a goal of creating "early seral" conditions through logging, but fails to divulge or analyze the scientific literature concluding that logging does not mimic the rich habitat structures and biodiverse habitat created by natural disturbance (higher-severity fire, or pockets of native beetle mortality) that creates natural early seral habitat, especially for some of the rarest and most imperiled wildlife species such as the Black-backed Woodpecker, and others (Hutto et al. 1995, Lindenmayer et al. 2004, Hutto 2008, Fontaine et al. 2009, Malison and Baxter 2010, Swanson et al. 2010, Burnett et al. 2011).

- The FEIS states a goal of shifting forest types away from fir to pine-dominated forest, and away from dense forest to open forest. However, the FEIS does not divulge the adverse impacts of this on Spotted Owls, especially given that the Owls select highly dense, fir-dominated forests and tend to avoid pine-dominated forest (Verner et al. 1992, Irwin et al. 2007, Underwood et al. 2010 [Table 3 and Fig. 4]). The adverse impacts of this goal on Spotted Owls are simply not adequately addressed.

- The FEIS's stated goal of converting forests to open, pine-dominated forest, based upon the assumption that historic forests were open, park-like, pine-dominated forest is simply not analyzed in light of recent scientific data that has empirically analyzed this same assumption in and shown the assumption to be inaccurate and over-simplified, concluding that historic forests were far denser than previously assumed, had far more smaller trees and more fir relative to pine, and were largely dominated by mixed-severity and high-severity fire, not low-severity fire (Leiberg 1902, Hodge 1906, USFS 1911, Hessburg et al. 2007, Baker 2012, Williams and Baker 2012). These data indicate that the Forest Service's stated goal would not produce a more ecologically resilient forest but, rather, would reduce ecological resiliency and take forests into a novel structure and composition outside of the range of natural historic variability. These studies are also based upon spatially massive data sets and indicate that a primary reason that the outdated management assumption that historic conditions were nearly all open and parklike pine-dominated forests is that previous studies were based upon either opportunistic sampling (not random or systematic sampling) and/or were based upon small, spatially-limited areas. The limitations of the Forest Service's assumptions in this regard, and the ecological risks associated with being incorrect—even partially—in these assumptions, are not adequately disclosed in the FEIS.

- The Vegetation section of the FEIS consistently describes patches of high-severity fire as destructive, and as a condition to be avoided, yet describes "early seral" conditions from logging as a desired condition. However, the FEIS fails to provide any sound ecological basis or citation to peer-reviewed ecological studies to support the assumption that logging equate to ecological restoration and improved ecological conditions while patches of high-severity fire, which create snag forest habitat, somehow represent ecological damage to be avoided.

### D. The FEIS Violates NEPA Because It Fails to Fully Consider a Reasonable Range of Alternatives

The EIS includes two intensive logging alternatives, Alternatives B and C, which are essentially identical, except that Alternative C envisions somewhat more intensive logging "to the lower range of desired tree stocking levels" (DEIS, p. 2-9). These alternatives would allow logging up to 10 acres in size, logging of trees over 30 inches in diameter at breast height under broad exceptions including trees that are a "source of insects" (which pertains to every old-growth tree in the forest), allow ecologically-important post-fire habitat created by moderate- and high-severity fire to be logged, contain no retention requirements in logging operations for basal area, contain no canopy cover retention requirements in logging operations outside of Spotted Owl Protected Activity Centers (PACs) and Home Range Core Areas (HRCAs), and allow commercial logging within Spotted Owl PACs and HRCAs with no basal area retention requirements or clear canopy cover retention standards.

The FEIS described Alternative D as a passive management plan that would rely upon natural processes, but would otherwise largely be a hands-off approach. The FEIS states that Alternative D would not pursue "active restoration" of forests and "[n]o active management would be implemented to stabilize or restore stream channels and associated riparian areas that are out of equilibrium or degraded due to past land use or climate change." Alternative D largely restricts the "rate of recovery" from past damage due to forest management and other factors to "natural processes". Outside of the narrow Defense Zone (which covers a minority of the forest), wherein some thinning would be allowed, management of trees would only occur where necessary to facilitate prescribed burning (12-inch diameter limit thinning prescription prior to burning, and only if required to conduct subsequent burning). Structured in this way, relative to Alternatives B and C, Alternative D is presented as an alternative that limits or prevents the types of ecological restoration and active management that the Forest Service claims is important and beneficial, such as: a) fewer acres of invasive species eradication (5 acres/year for Alt. D versus 5-40 acres/year for Alt. B and C); b) equal acres of "thinning and fuel reduction" in the Wildland Urban Interface Zone (WUI) but with much more limited options in terms of managing trees over 12 inches in diameter for Alt. D relative to Alts. B and C, and Alt. A; c) fewer acres per year of "forest stand resiliency" work in the general forest and backcountry areas (300 acres/year for Alt. D versus 500 acres/year and 1,000 acres/year for Alts. B and C, respectively, and Alt. A), and relatively more limits on management of mature trees under Alt. D; d) *theoretically* more acres of prescribed fire per year under Alt. D, but *realistically* (according to the FEIS) potentially fewer acres of burning under Alt. D than the other alternatives due to the objective of generally burning without pre-fire thinning, and restrictions on timing of burning, and feasibility of burning in light of weather and air quality restrictions; e) "restoration" of 5,000 to 24,000 acres of Spotted Owl PACs and HRCAs (in the life of the revised forest plan, apparently) under Alts. B and C, versus 0 acres of "restored" PACs and HRCAs under Alt. D; f) 82 miles of stream restoration under Alts. B and C, and Alt. A, versus only 70 miles under Alt. D; and g) 3,338 acres of SEZ (stream zone) restoration under Alts. B and C, and Alt. A, versus only 3,087 acres under Alt. D.

As such, Alternative D is set up as a straw man to be knocked down and is presented as being relatively more risky, or less beneficial to ecological objectives, in most important ways such as with regard to: a) threatened or endangered plants (e.g., FEIS describing Alts. B and A as creating a stable or increasing trend due to greater active management, while Alt. D is described as stable or decreasing trend due to no active habitat restoration ; b) sensitive plant species (same as "a"); c) climate change (FEIS, stating that Alt. D does not allow managers flexibility to implement strategies in addressing climate change, while describing Alts. A and C as allowing ample flexibility to address climate change, and Alt. B as the best overall alternative in this regard due to the active management approach); d) forest structure and forest type conversion (FEIS, describing Alt. D as inferior to the other alternatives ostensibly because it relies upon hand thinning, and might not result in sufficient opening as trees get larger); e) forest stand resiliency-thinning (FEIS, describing Alts. B and C as the best, due to ability to manage larger trees, and describing Alt. A as somewhat limited, while describing Alt. D as the worst alternative—worse than Alt. A—ostensibly because it is unable to meet density for resiliency due to reliance on hand thinning and restrictions of managing mature trees); f) meadows/riparian/aspen (FEIS, describing Alts. B, C, and A as creating a positive trend, while describing Alt. D as creating a positive trend in only limited areas, while resulting in a negative trend in other areas due to less active management); g) forest types (FEIS, describing Alts. B and C as creating a stable or positive trend in forest type diversity, resiliency, and heterogeneity, while describing Alt. D as creating a potential for decreasing trend where vegetation management is limited); and h) montane chaparral.

The FEIS states plainly that there is a need to revise the LTBMU Forest Plan, so it is clear that Alternative A, which is the existing 1988 LTBMU Forest Plan, is not seriously considered for selection, which leaves the nearly identical Alternatives B and C (essentially one action alternative) to be compared to the straw-man alternative, Alternative D. This is not a reasonable range of alternatives being given full consideration and analysis, especially for a plan that will be in place for at least 15-20 years, because the FEIS does not include an action alternative (for full and complete consideration and analysis) that would institute an active management approach that would result in more active management than Alts. B and C (and A), but would do so in a non-commercial, ecological approach that would focus on actively managing forests, including mature trees, to accomplish ecological goals, but by actively creating habitat structures without commercial logging—i.e., without removing wood commodities (sawtimber or biomass) from the LTBMU (personal use firewood permits would, therefore, be allowed, as this is not wood commodity production). We request that you issue a Supplemental DEIS to fully analyze such an active management non-commercial alternative, and allow full public comment on it. As Hanson et al. (2010) describe, active management is not limited to commercial timber harvest and removal, and includes activities such as snag and downed log creation (in lieu of removal of mature trees, which creates only stumps), invasive weed eradication, logging road decommissioning and re-vegetation, as well as prescribed fire and managed wildland fire. Where thinning occurs, material would be piled and burned, masticated, used for structures on the LTBMU for trails, interpretive structures, or fences, or made available to the public for personal use firewood permits. Such an alternative is fully consistent with a DEIS that claims, "There is no timber program".

Under this active management non-commercial-logging alternative, relative to Alternatives B, C, A, and D, there would be: a) more acres of invasive weed eradication; b) slightly more acres of fuel reduction in the WUI than Alts. B and C (the 12-inch diameter limit of Alt. D would not apply under this non-commercial alternative—trees larger than 12 inches in diameter could either be girdled or otherwise turned into snags, felled to create large downed log structure, piled and burned, or removed for LTBMU use or personal use firewood permits); c) more acres per year of "forest stand resiliency" work than Alts. B and C (and A and D) through active snag creation and active downed log creation (no upper diameter limit) to manage forest type, structure and diversity while creating important habitat structures upon which benefit native wildlife species; d) equal or greater acres of prescribed fire and managed wildland fire compared to Alts. B and C, but without the restrictions of Alt. D in terms of the size of trees that could be managed prior to fire; e) equal or greater acres of restoration of Spotted Owl PACs and HRCAs compared to Alts. B and C but, again, without using commercial timber harvest as the "restoration" tool (i.e., instead using active snag and downed log creation, which creates essential habitat for Spotted Owls [Verner et al. 1992], as well as prescribed fire); and e) more miles of stream restoration and more acres of SEZ restoration than Alts. B and C (and A and D).

Under this alternative, there would also be a clear forest-wide standard requiring the LTBMU to maintain viable populations of native wildlife species by maintaining sufficient habitat to ensure the LTBMU's range-wide share of viable populations of Management Indicator Species (MIS) on the LTBMU national forest planning area, thereby eliminating the potential for active management to reduce ecological resiliency by causing habitat loss or alteration that would lead to the extirpation of native species—a safeguard that Alts. B and C do not include as a forest-wide standard.

There is nothing in the FEIS's description of the key goals of the forest plan revision that would preclude such an alternative—i.e., wood products commodity production (sawtimber or biomass) is not listed as one of the goals. Rather, all key issues/goals are described only in non-commercial terms, e.g., "Watershed Health and Aquatic Ecosystems Issues", "Terrestrial Ecosystem Issues", "Recreation Issues", and "Access and Travel Management Issues".

Moreover, without this sort of non-commercial active ecological management alternative, the FEIS is fundamentally misleading, in further violation of NEPA, given the U.S. Forest Service's Region 5 Fiscal Year 2012 Final Budget Advice and Fiscal Year 2013 Preliminary Budget Assessment, which set quantitative commercial timber harvest volume targets/quotas (in millions of board feet, and acres of mechanical harvest, both) for each national forest in the Sierra Nevada. If the Regional Office is setting timber commodity production levels for each national forest in the Sierra Nevada, any forest plan revision, including the LTBMU, must fully and completely disclose this fact, and its implications for the limitation of non-commodity ecological management options.

It is particularly important, ecologically, to fully and completely consider such a non-commercial active ecological management alternative, given that "diversity" and "heterogeneity" in forest structure from logging activities, which remove structural elements, are often fundamentally different from natural disturbance—or snag/log creation that mimics natural disturbance—in terms of their effects on native biodiversity, especially some of the rarest species of concern. The emerging evidence indicates this to be the case for Spotted Owls, as data show that occupancy is harmed by logging (Seamans and Gutierrez 2007), the owls strongly tend to avoid mechanically thinned areas (Keane et al. 2011), and logging facilitates invasion of aggressive barred owls, which often out-compete Spotted Owls (Dugger et al. 2011). In contrast, mixed-severity fire, without post-fire logging, creates important suitable post-fire foraging habitat for Spotted Owls, and the owls preferentially select unlogged moderate-severity and high-severity fire areas for foraging (Bond et al. (2009a). Mixed-severity fire, with an average of about 32% high-severity effects in home range core areas, does not reduce occupancy of Spotted Owls (Bond et al. 2012 in press). Similarly, both pre-fire and post-fire logging harm Black-backed Woodpeckers, while fire alone and very high snag densities in unburned forest (snag densities at levels similar to those found in moderate/high-severity burn areas) provide excellent suitable habitat (Goggans et al. 1989 [Table 8, showing almost complete avoidance of salvage logged areas among Black-backeds otherwise nesting in unburned forest with very high snag density from beetle mortality], Hanson and North 2008, Hutto 2008, Siegel et al. 2012a, Siegel et al. 2012b [finding Black-backed selecting areas of highest post-fire snag basal area, while, in Fig. 10, almost completely avoiding salvage logged areas]). The Forest Service's own data indicates that higher-severity post-fire conditions create *unique* and ecologically important habitat (Burnett et al. 2010, Burnett et al. 2011), and such habitat is not mimicked by mechanical thinning or clearcutting (Swanson et al. 2011).

With regard to active snag creation, scientific data indicates that average snag densities in the natural condition on the LTBMU is about 8 snags per acre over 16 inches in diameter at breast height in unburned forest (Barbour et al. 2002), and Verner et al. (1992) recommend at least 8 large snags per acre for Spotted Owl foraging habitat, equating to at least 20 square feet per acre of large snag basal area (and more for nesting habitat), and successful Black-backed Woodpecker nesting is associated with considerably higher snag densities than this—at least several dozen large snags per acre (Goggans et al. 1989, Bonnot et al. 2008, Bonnot et al. 2009, Siegel et al. 2012b). The Forest Service's own recent technical report concludes that natural mortality levels in unburned conifer forests of the Sierra Nevada are about 8-14% (North 2012, p. 18), which equates to about 10 large snags per acre on the LTBMU, given the FEIS's estimate of an average of about 100 trees per acre over 15 inches in diameter on the LTBMU. In contrast, there are only about 5-6 snags per acre on average currently on the LTBMU in unburned forest. Current science shows that higher snag densities do not result in higher fire severity when fire occurs (Bond et al. 2009b) and, in fact, will tend to result in lower fire severity (Simard et al. 2011), so creating additional large snags in the context of active ecological management is not inconsistent even with management in the WUI. Moreover, as discussed immediately below, by devoting greater effort to protecting homes from fire in far less acreage than that envisioned by the FEIS, home protection can be maximized while minimizing the need to conduct thinning/fuels management operations deeper into the forest.

## III. Statement That Demonstrates The Link Between Prior Substantive Formal Comments Attributed To The Objector And The Content Of The Objection, Unless The Objection Concerns An Issue That Arose After The Opportunities For Formal Comment.

We provided detailed comments on the same issues discussed above during the Draft phase.

Thank you for your consideration of this Objection. We are hopeful that it will be used to create a Final Plan that provides needed protections for the wildlife that calls the LTBMU home.

Sincerely,

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